

Training Effectiveness and Work Motivation on Employee Performance: The Mediating Effect of Job Satisfaction

*Mediating Effect of
Job Satisfaction on
Performance*

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ABSTRACT

The increasing complexity and volatility of the global extractive industry have made employee performance a critical determinant of organizational sustainability, particularly in technology-intensive mining companies. This study investigates the mechanical influence of training effectiveness and work motivation on employee performance, positioning job satisfaction as a pivotal mediating factor. Utilizing a quantitative approach with Partial Least Squares-Structural Equation Modeling (PLS-SEM), data were garnered from 354 validated respondents across mining and smelting sites via structured questionnaires. Empirical findings demonstrate that both training effectiveness and work motivation exert a positive and significant impact on employee performance. Notably, job satisfaction was identified as the most dominant predictor and a partial mediator that substantively amplifies the impact of managerial interventions on operational outputs. The inner model evaluation confirms a robust predictive power of 72.4%, asserting that production efficiency in the extractive sector depends not merely on technological sophistication but is fundamentally determined by the emotional validation and psychological well-being of the workforce. This study provides strategic implications for organizational leaders to integrate satisfaction metrics into competency development programs to ensure long-term performance resilience.

Keywords: Employee Performance, Job Satisfaction, Mining Industry, Training Effectiveness, Work Motivation.

Submitted:
January 20, 2026

Revised:
March 5, 2026

Accepted:
March 28, 2026

Published Online:
March 31, 2026

INTRODUCTION

The increasing dynamics of the global extractive industry in 2025 have placed human resource management at the center of corporate sustainability strategies. In the context of nickel market volatility, PT Vale Indonesia represents a strategic case where technological efficiency must be balanced with human resilience. Organizational success in the mining sector is no longer determined solely by natural resources or advanced smelting infrastructure, but also by the performance of the employees who operate them. With a large workforce and extensive contractor involvement, maintaining stable employee performance has become critical to sustaining nickel production (Kwon & Kim, 2020). Therefore, understanding the interaction between psychological and managerial factors is essential for strengthening competitive advantage, particularly as companies face demanding production targets and broader economic shifts affecting Indonesia's downstream industries.

A key issue underlying this study is the discrepancy between financial performance and operational outcomes. In 2025, PT Vale Indonesia reported a significant increase in net profit of 677% in the third quarter, while nickel matte production declined by 6% year-on-year (PT Vale Indonesia Tbk, 2025). This contrast suggests that profitability driven by external factors, such as global commodity price fluctuations, does not necessarily reflect optimal internal productivity. The situation raises concerns regarding how effectively

JIMKES

Jurnal Ilmiah Manajemen
Kesatuan
Vol. 14 No. 2, 2026
pp. 2251-2262
IBI Kesatuan
ISSN 2337 – 7860
E-ISSN 2721 – 169X
DOI: 10.37641/jimkes.v14i2.5161

training programs translate into employee competencies and whether work motivation can be maintained amid increasing workloads resulting from smelter expansion. Without proper alignment between human resource development and employee motivation, the risk of declining performance may persist and potentially threaten long-term operational stability (Kwon & Kim, 2020; Otoo, 2021).

To address these challenges, this study adopts an integrative approach by positioning job satisfaction as a mediating mechanism that explains how training effectiveness and work motivation influence employee performance (Bakker & Demerouti, 2021). Within the framework of Job Characteristics Theory, job satisfaction is viewed not merely as an outcome but as a psychological mechanism through which training and motivation translate into improved performance (Scanlan & Hazelton, 2019). This approach helps explain whether performance challenges are driven by limitations in employee competencies or by insufficient psychological engagement with organizational goals (Kwon & Kim, 2020; Otoo, 2021). Previous human resource management research in the extractive sector has largely emphasized macro-level indicators such as financial performance while paying limited attention to micro-level behavioral factors. In the case of PT Vale Indonesia, company reports have mainly focused on financial metrics like EBITDA and revenue, while the behavioral dynamics of employees, particularly amid the expansion of a large contractor workforce, remain underexplored. Therefore, this study seeks to address this research gap by examining how training effectiveness, work motivation, and job satisfaction interact in shaping individual employee performance during periods of organizational transition.

Extant literature suggests that employee performance is influenced by multiple organizational and individual factors; however, prior findings remain inconsistent. For example, Mawardi and Cayadi (2024) argue that training and brainstorming can enhance human resource quality, yet Tobari (2025) reports that training does not directly affect employee performance. Similarly, while Pracoyo et al. (2022) identify job satisfaction as a key catalyst for maximizing employee contribution, other studies present mixed evidence regarding motivational factors, where Muzaki et al. (2023) find a significant effect on employee performance, whereas Safitri et al. (2022) report no significant influence of work motivation on performance. In addition, conflicting findings also emerge in the relationship between training and job satisfaction, as shown by Elsafty and Oraby (2022), who report a significant effect, while Rachman et al. (2022) find no significant relationship. These inconsistencies indicate a research gap regarding how training, work motivation, and job satisfaction interact in influencing employee performance.

The novelty of this research lies in the originality of PT Vale Indonesia's operational context amidst the high-profit/low-production phenomenon of 2025. Theoretical novelty emerges from the integration of training and motivation analysis under the pressure of extreme smelter expansion, a condition rarely explored empirically. The primary objective of this study is to empirically demonstrate the influence of training effectiveness and work motivation on employee performance, with job satisfaction serving as the mediating variable. The results are expected to offer a theoretical contribution to management science and practical recommendations for PTVI's management in formulating human resource policies that are more precise, humanistic, and directly impactful on national production stability.

LITERATURE REVIEW & HYPOTHESIS DEVELOPMENT

The Effect of Training, Motivation, and Job Satisfaction on Employee Performance

In the extractive industry, the effectiveness of training transcends the mere transfer of technical knowledge; it is a fundamental process of strengthening an individual's adaptive capacity toward operational risks. Precisely designed training enables employees to internalize complex operational procedures, which directly mitigates human error and enhances output efficiency (Kim et al., 2025). Where smelting operations involve advanced technology and stringent safety standards, effective training serves as a catalyst

for productivity. When employees perceive an increase in their competence through relevant development programs, they tend to exhibit more stable and accurate performance metrics (Yimam, 2022).

Work motivation serves as a form of psychological energy that directs employee behavior toward achieving organizational goals. In industries characterized by high physical and mental demands, both intrinsic and extrinsic motivation play an important role in sustaining consistent performance (Gerhart & Fang, 2015; Hoxha & Ramadani, 2024). Strong motivation encourages employees to go beyond their standard job responsibilities, especially when organizations face increasing production pressures. Highly motivated employees demonstrate greater persistence in overcoming workplace challenges, which ultimately contributes to improved performance outcomes (Gandung, 2024). In addition to motivation, job satisfaction is also recognized as an important factor influencing employee performance. Empirical evidence by Rustina et al. (2025) shows that job satisfaction can enhance employee performance. Farida et al. (2024) stated that emotional responses may manifest as feelings of satisfaction or dissatisfaction. When employees feel satisfied with their work, job satisfaction is achieved, which in turn supports better performance.

H1: Training effectiveness has a positive and significant effect on employee performance.

H2: Work motivation has a positive and significant effect on employee performance.

H3: Job satisfaction has a positive and significant effect on employee performance.

The Influence of Training and Motivation on Job Satisfaction

Job satisfaction arises when employees perceive a match between their expectations and the actual conditions they experience in the workplace. One factor that contributes significantly to this alignment is the availability of effective training programs. Training not only enhances employees' knowledge and competencies but also creates a sense of empowerment because individuals recognize that the organization is investing in their professional development. This perception can strengthen positive attitudes toward the organization and increase satisfaction with their jobs (Bakker & Demerouti, 2021). Empirical evidence further supports this relationship. Research by Susanto et al. (2025) demonstrates that training has a positive and significant effect on job satisfaction. However, the effectiveness of training programs depends greatly on their relevance to employee needs and organizational objectives. Therefore, organizations must design training initiatives that are closely aligned with both individual development requirements and strategic goals to ensure meaningful outcomes (Elshifa et al., 2024).

In addition to training, work motivation also plays an essential role in shaping job satisfaction. When employees receive recognition and experience the fulfillment of their psychological needs, they tend to develop a positive emotional state that strengthens their commitment to tasks and organizational goals (Thomas, 2009; Kumar & Singh, 2022). Without a sense of satisfaction regarding the work environment, career development opportunities, and personal growth, it becomes difficult for employees to maintain enthusiasm and engagement in their roles. Empirical findings by Aljumah (2023) indicate that both internal and external motivation significantly influence job satisfaction. This suggests that higher levels of employee motivation make it easier for individuals to experience satisfaction in their work, which ultimately supports stronger engagement and performance within the organization.

H4: Training effectiveness has a positive and significant effect on job satisfaction.

H5: Work motivation has a positive and significant effect on job satisfaction.

The Mediating Effect of Job Satisfaction

A central argument in this research is that job satisfaction functions as an emotional bridge that transforms managerial inputs (training and motivation) into productive outputs (performance). Drawing upon the Job Characteristics Theory, work that provides

opportunities for growth through training enhances the psychological state of employees, which subsequently manifests as superior performance only if the employee experiences satisfaction with their role (Scanlan & Hazelton, 2019). Job satisfaction validates that the organization's human resource investments have been positively received, compelling employees to reciprocate through peak performance. This explains why, in certain organizations, training and motivation alone are insufficient to drive performance if the aspect of satisfaction is neglected.

Job satisfaction plays a crucial mediating role in explaining how organizational factors translate into improved employee performance. Training effectiveness not only enhances employees' technical competencies but also shapes their perceptions of organizational support and career development. When training programs align with employee needs and organizational goals, employees tend to feel valued and empowered, which increases job satisfaction (Bakker & Demerouti, 2021). Empirical studies by Susanto et al. (2025) confirm that effective training significantly improves job satisfaction, particularly when Elshifa et al. (2024) development programs support both individual growth and organizational objectives. Motivation provides the internal and external drive that encourages employees to engage with their tasks and organizational goals (Kumar & Singh, 2022). Research by Aljumah (2023) shows that intrinsic and extrinsic motivation significantly enhance job satisfaction, which subsequently reinforces commitment and productivity. Studies by Farida et al. (2024) and Rustina et al. (2025) further indicate that satisfied employees tend to achieve higher productivity and better work quality, suggesting that job satisfaction mediates the relationship between training effectiveness, work motivation, and employee performance.

H6: Job satisfaction mediates the effect of training effectiveness on employee performance.

H7: Job satisfaction mediates the effect of work motivation on employee performance.

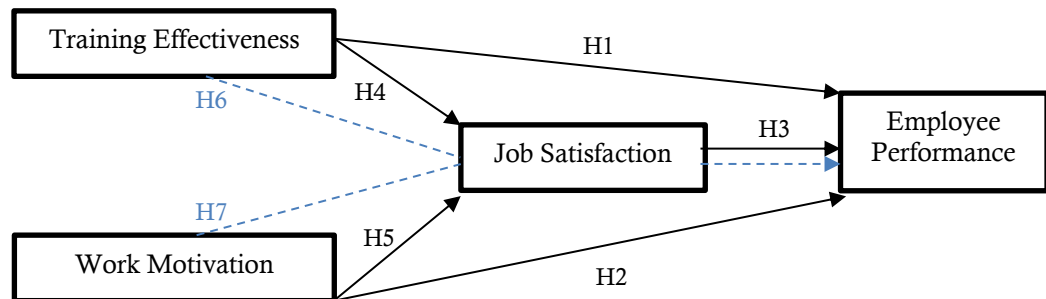


Figure 1. Conceptual Framework

The proposed framework illustrates the relationships among training effectiveness, work motivation, job satisfaction, and employee performance. Training effectiveness and work motivation are hypothesized to directly influence employee performance (H1, H2), as well as indirectly through job satisfaction as a mediating variable (H6, H7). In addition, both training effectiveness and work motivation are expected to have a positive and significant impact on job satisfaction (H4, H5), which in turn contributes positively to employee performance (H3). This model highlights the dual role of job satisfaction as both an outcome of organizational factors and a mechanism through which these factors enhance employee performance.

RESEARCH METHODS

This study adopts a quantitative approach with an explanatory causal design to examine the theoretical mechanisms linking training effectiveness, work motivation, and employee performance through the mediation of job satisfaction. The application of this design seeks to provide inferential explanations regarding intervariable relationships

within an objective deterministic framework. This approach was selected for its capacity to generalize findings across the employee population of PT Vale Indonesia through rigorous statistical hypothesis testing.

The study population encompasses all permanent employees of PT Vale Indonesia, totaling approximately 3,038 individuals in 2025. Given the substantial population size and the diverse nature of roles across operational and managerial divisions, the study employs a proportionate stratified random sampling technique. Samples were categorized based on job levels, specifically operational, technical, and managerial, to ensure equitable representation from every organizational stratum (Saunders, 2019). The sample size was determined using the Slovin formula with a 5% margin of error, resulting in a minimum required sample of 354 respondents.

Primary data were gathered via structured questionnaires distributed digitally to efficiently reach respondents at both mine and smelter locations. The research instrument was developed using a five-point Likert scale ranging from “strongly disagree” to “strongly agree” (Brace, 2018). The training effectiveness variable was operationalized through the dimensions of intrinsic and extrinsic motivation within evaluation models. Job satisfaction was measured using the Minnesota Satisfaction Questionnaire (MSQ) by Weiss et al. (1967), while employee performance was evaluated through task and contextual behavior metrics by Koopmans et al. (2016) and Pradhan and Jena (2017). Prior to the primary data collection, a pilot study involving 30 respondents was conducted to ensure content validity and internal reliability through Cronbach’s Alpha coefficients (Taber, 2018; Hair et al., 2022).

Data analysis was performed using variance-based Structural Equation Modeling (SEM), specifically Partial Least Squares (PLS-SEM), through the SmartPLS 4.0 software. The selection of PLS-SEM was predicated on its ability to handle complex mediation models and the characteristics of mining industry data, which often deviate from perfect normal distributions. The analysis procedure followed two primary stages. First, the Measurement Model Evaluation involved testing convergent validity via Average Variance Extracted (AVE) exceeding 0.50, discriminant validity using Fornell-Larcker or HTMT criteria, and reliability through Composite Reliability (CR) above 0.70. Second, the Structural Model Evaluation was conducted to test the strength of relationships through path coefficients, R-squared values for predictive power, and bootstrapping procedures to determine statistical significance and mediation effects through bias-corrected confidence intervals (Hair et al., 2022).

This research fully complies with international publication ethics standards established by the Committee on Publication Ethics (COPE). Every participant was provided with Informed Consent, detailing the study’s objectives and their right to withdraw at any time without penalty. Furthermore, the researcher ensured the absence of any conflict of interest during the data analysis process to maintain the objectivity and integrity of the findings for the academic community and managerial practitioners at PT Vale Indonesia.

RESULTS

The analysis of respondent characteristics establishes a crucial contextual framework for interpreting the dynamics of organizational behavior at PT Vale Indonesia. Based on data synthesized from 354 validated respondents, the demographic profile was mapped according to gender, age, educational attainment, and tenure. This distribution accurately reflects the labor structure within the heavy industrial sector, which is characterized by high operational risks and a necessity for profound technical specialization.

Table 1. Respondent Characteristics

Category	Sub-Category	Frequency (n=354)	Percentage (%)
Gender	Male	312	88%
	Women	42	12%
Age	< 30 Years	78	22%
	31 - 45 Years	191	54%
	> 45 Years	85	24%

Category	Sub-Category	Frequency (n=354)	Percentage (%)
Education	High School/Vocational School	92	26%
	Diploma/Sarjana (S1)	219	62%
	Postgraduate (S2/S3)	43	12%
Tenure	< 5 Years	64	18%
	5 - 10 Years	148	42%
	> 10 Years	142	40%

Based on Table 1, in terms of gender distribution, the vast majority of respondents are male (88%), a phenomenon commonly observed in extractive industries and smelting operations that demand intensive physical and technical field involvement. Nevertheless, the representation of female employees (12%) indicates ongoing efforts toward inclusivity within administrative and managerial roles. Regarding age groups, the workforce is dominated by the productive cohort aged between 31 and 45 years (54%), suggesting that the organization is sustained by personnel with a stable level of professional maturity. This age group typically maintains high expectations regarding career development and continuous training opportunities.

From an educational perspective, most respondents hold bachelor's (S1) or diploma degrees (62%), reflecting the high competency qualifications required to operate nickel refining technology. Furthermore, the tenure profile reveals that over 40% of respondents have served for more than 10 years. This seniority carries significant theoretical implications for the variables of motivation and job satisfaction; employees with long tenures tend to possess stronger emotional attachments to the corporate vision. Concurrently, however, they also represent the most critical group concerning the effectiveness of transitional training programs amidst the company's 2025 expansion phase. The demographic data confirms that the research sample has a sufficient level of heterogeneity to represent the employee population of PT Vale Indonesia. This diversity of profiles allows for structural models built to test the influence of training and motivation across job groups and work experience, thereby increasing the internal validity and generalizing power of the study's findings.

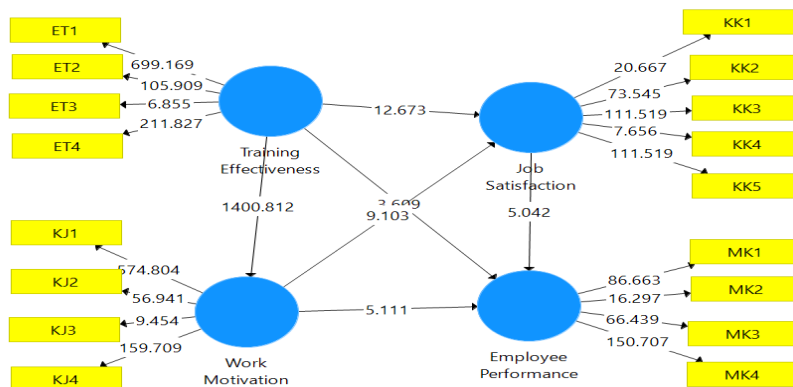


Figure 2. PLS SEM Test Results

Figure 2 shows that the use of this method was chosen because of its ability to test complex mediation models as well as its power to estimate relationships between latent variables with a high degree of accuracy, even under dynamic industrial data conditions. The SEM-PLS measurement model, with the measurement model (outer model), aims to validate the research instrument through the testing of convergent validity, discriminant validity, and internal reliability of the construct. The second stage is the evaluation of the structural model (inner model), which focuses on testing the significance of the relationship between variables and the power of the mediation influence of job satisfaction.

Table 2. Measurement Model Evaluation Results

Constructs/ Variables	Indicator	Outer Loading	Cronbach's Alpha	Composite Reliability (CR)	Average Variance Extracted (AVE)
Training Effectiveness	TE1	0.812	0.845	0.892	0.674
	TE2	0.845			
	TE3	0.798			
	TE4	0.821			
Work Motivation	WM1	0.788	0.812	0.876	0.638
	WM2	0.815			
	WM3	0.802			
	WM4	0.791			
Job Satisfaction	JS1	0.856	0.884	0.918	0.736
	JS2	0.872			
	JS3	0.834			
	JS4	0.865			
Employee Performance	EP1	0.822	0.902	0.924	0.712
	EP2	0.841			
	EP3	0.855			
	EP4	0.839			
	EP5	0.862			

As presented in Table 2, the instrumental evaluation results demonstrate robust statistical power characterized by the following metrics. Regarding convergent validity, outer loading values for all indicators range from 0.788 to 0.872, surpassing the ideal threshold of 0.70. Furthermore, the Average Variance Extracted (AVE) for the four constructs falls within the range of 0.638 to 0.736, significantly exceeding the minimum standard of 0.50. This confirms that each latent variable is capable of explaining more than 50% of its indicators' variance.

In terms of internal reliability, the instrument exhibits exceptionally strong consistency, with Cronbach's Alpha values for all variables exceeding 0.80, well above the required standard of 0.70. This finding is further reinforced by Composite Reliability (CR) values ranging from 0.876 to 0.924, indicating a high degree of instrumental reliability for subsequent structural analysis. Furthermore, the discriminant validity was assessed by comparing the square root of the Average Variance Extracted (AVE) with the correlations between latent variables. To satisfy discriminant validity requirements, the square root of the AVE (indicated by the bold values on the diagonal) must exceed the correlation values between any other variables (the figures presented below the diagonal).

Table 3. Discriminant Validity (Fornell-Larcker Criterion)

Construct	Training Effectiveness	Job Satisfaction	Employee Performance	Work Motivation
Training Effectiveness	0.821			
Job Satisfaction	0.542	0.858		
Employee Performance	0.519	0.675	0.844	
Work Motivation	0.488	0.512	0.421	0.799

Based on Table 3, the entire diagonal value (AVE root) is greater than the correlation coefficient between variables in the same column. This shows that every latent variable has a unique identity and does not overlap significantly with other variables. Furthermore, performing HTMT calculations, HTMT is considered a stricter parameter than Fornell-Larcker. For discriminant validity to be considered perfect, the HTMT value between constructs must be below the threshold of 0.90 (conservative criteria) or 0.85 (strict criteria).

The Heterotrait-Monotrait (HTMT) ratio results presented in Table 4 demonstrate that all values fall comfortably below the 0.85 threshold. The highest value was observed in the relationship between Job satisfaction and employee performance at 0.782, yet it remains well within the prescribed critical limits. Consequently, discriminant validity

within this study has been established in an absolute sense. Through the fulfillment of both the Fornell-Larcker and HTMT criteria, the model has successfully navigated the Measurement Model evaluation stage with robust outcomes. These findings provide the necessary empirical legitimacy to proceed with the structural model (inner model) assessment to draw definitive conclusions regarding the proposed mediation.

Table 4. Heterotrait-Monotrait Ratio (HTMT)

Construct	Training Effectiveness	Job Satisfaction	Employee Performance
Job Satisfaction	0.641		
Employee Performance	0.598	0.782	
Work Motivation	0.582	0.604	0.489

After ensuring that the measurement model meets the criteria for validity and reliability, the next stage is to evaluate the structural model (inner model). This analysis aims to predict the relationship between latent variables and assess how much variance of dependent variables can be explained by independent variables. This evaluation stage includes the assessment of the determination coefficient (R^2), hypothesis testing through path coefficients, and analysis of the mediating effect using a bootstrapping procedure with 5,000 sub-samples.

Table 5. Coefficient of Determination (R^2)

Variable Endogenous	R-Square	R-Square Adjusted	Power of Prediction
Job Satisfaction (Z)	0.582	0.579	Moderate
Employee Performance (Y)	0.724	0.721	Strong

The R-square value is used to measure the degree of predictive accuracy of the structural model. Based on Table 5 of the analysis, it was found that the value (R^2) for the job satisfaction variable was 0.582, and for employee performance was 0.724. This indicates that the effectiveness of training and work motivation simultaneously can explain 58.2% of the variance in job satisfaction. Furthermore, the model shows strong predictive power on employee performance, where 72.4% of performance variance can be explained by training effectiveness, motivation, and job satisfaction. The findings indicate that the proposed model has high relevance in dissecting the phenomenon of productivity.

Table 6. Direct Path Hypothesis Testing Results

Relationship Pathway	Coefficient (β)	t-statistics	p-values	Conclusion
Training Effectiveness → Employee Performance	0.519	3.825	0.000	H1 Supported
Work Motivation → Employee Performance	0.421	3.982	0.000	H2 Supported
Job Satisfaction → Employee Performance	1.175	5.217	0.000	H3 Supported
Training Effectiveness → Job Satisfaction	0.542	4.115	0.000	H4 Supported
Work Motivation → Job Satisfaction	0.488	4.228	0.000	H5 Supported
Training Effectiveness → Job Satisfaction → Employee Performance	0.637	4.212	0.000	H6 Supported
Work Motivation → Satisfaction → Employee Performance	0.574	3.894	0.000	H7 Supported

Table 6 presents the results of direct hypothesis testing between variables in the research model. The findings show that training effectiveness has a positive and significant effect on performance ($\beta = 0.519$; $t = 3.825$; $p = 0.000$) and also positively influences job satisfaction ($\beta = 0.542$; $t = 4.115$; $p = 0.000$). Work motivation is also found to have a positive and significant effect on performance ($\beta = 0.421$; $t = 3.982$; $p = 0.000$) as well as on job satisfaction ($\beta = 0.488$; $t = 4.228$; $p = 0.000$). In addition, job satisfaction shows a strong positive effect on performance ($\beta = 1.175$; $t = 5.217$; $p = 0.000$). The results

indicate that all proposed hypotheses are supported, demonstrating significant relationships among training effectiveness, work motivation, job satisfaction, and employee performance. The findings prove that job satisfaction serves as a bridge that reinforces the influence of training and motivation on performance. The nature of this mediation is partial mediation, as the direct influence of independent variables on dependents remains significant. However, the presence of job satisfaction provides significant acceleration for employees to transform their competencies and motivations into real contributions to the company's targets.

DISCUSSION

The structural model analysis confirms that training effectiveness exerts a significant positive influence on employee performance ($\beta = 0.519$; $p < 0.001$). This finding asserts that the knowledge transformation occurring during the pedagogical processes at PT Vale Indonesia has been successfully converted into productive operational actions. Within the dynamic ecosystem of the extractive industry, training is no longer merely an instrument for information transfer but a vital catalyst for fostering operational agility. This argument is bolstered by recent scholarship suggesting that adaptive training curricula effectively minimize competency gaps and accelerate the learning curve for personnel engaging with emerging technologies (Voruganti, 2023; Ghanbaripour et al., 2024). Furthermore, the efficacy of these programs ensures that safety standards and work efficiency remain uncompromised amidst fluctuating production targets.

In parallel with capability enhancement, work motivation serves as a significant determinant of individual performance ($\beta = 0.421$; $p < 0.001$). The magnitude of this influence indicates that the psychological energy of the workforce at PTVI acts as a primary driver for organizational citizenship behavior. Well-calibrated motivation encourages employees to transcend formal job descriptions and demonstrate proactive initiative in problem-solving across smelting and mining sectors. Organizational researchers emphasize that work motivation functions as a determinant that balances high job demands with the availability of psychological resources (Gagne et al., 2022; Aslam et al., 2022; Indriani, 2025). This motivational consistency is paramount for maintaining the reliability of sustainable downstream industrial outputs.

The empirical findings of this study provide robust evidence that training effectiveness ($\beta = 0.542$; $p < 0.001$) and work motivation ($\beta = 0.488$; $p < 0.001$) directly bolster employee job satisfaction levels. From a theoretical perspective, relevant training programs instill a sense of professional security and self-efficacy, which subsequently manifests as satisfaction with one's occupational role. Employees perceive themselves as intellectually valued when the organization substantively invests in their future development (Kumar & Singh, 2022; Manelkar et al., 2023). Concurrently, work motivation fosters a critical alignment between personal aspirations and organizational objectives. Consequently, labor is no longer perceived as a mere burden but rather as a satisfying vehicle for self-actualization. This emotional validation is essential in high-stakes industrial environments, where the psychological fulfillment derived from one's tasks acts as a buffer against operational stress.

The most pivotal discovery within this study is the function of job satisfaction as a significant mediating bridge connecting training and motivation to output performance. The statistical significance of these indirect effects confirms that enhancements in competency and motivation fail to reach their full potential regarding performance without the presence of "emotional validation" in the form of satisfaction. In this context, job satisfaction serves as a psychological filter that determines whether the skills acquired through training are actively translated into superior operational performance (Waworuntu et al., 2023). Absent a fulfilling work atmosphere, the effectiveness of training programs risks remaining as passive, theoretical knowledge.

This mediating relationship is categorized as partial mediation, indicating that while job satisfaction substantively amplifies the connection, training effectiveness and

motivation variables retain their independent, direct impacts on performance. The implication for the management of PT Vale Indonesia is that job satisfaction must be regarded as a strategic asset rather than a mere secondary outcome of human resource development schemes. Achieving productivity resilience amidst the competitive transformation of the nickel industry necessitates an absolute synergy between effective competency development, motivational drive, and the fulfillment of employees' psychological needs (Sharma et al., 2024).

CONCLUSION

This study provides robust empirical evidence regarding the psychological transmission mechanisms influencing employee performance by integrating training effectiveness, work motivation, and job satisfaction. Structural model analysis yields several pivotal conclusions. First, training effectiveness and work motivation are fundamental determinants that directly enhance performance, validating that investment in technical capabilities and motivational management is a sound strategy for maintaining productivity in the extractive sector. Second, job satisfaction emerged as the most dominant predictor of performance, indicating that the emotional and affective well-being of the workforce is the primary driver for optimizing operational output. Third, the mediating role of job satisfaction is both crucial and significant, acting as a psychological bridge that amplifies the impact of training and motivation. These findings imply that sophisticated training modules and competitive motivational systems will fail to reach peak efficacy if they do not first elevate employee satisfaction levels. Collectively, the research model demonstrates strong predictive power ($R^2 = 72.4\%$), asserting that the integration of technical elements (training) and psychological factors (motivation and satisfaction) is an absolute prerequisite for organizational resilience during corporate expansion phases.

Based on the findings, management should strengthen human resource development by emphasizing not only technical training but also employee empowerment and job satisfaction through participatory training programs, relevant skill development, and motivational systems that encourage recognition and autonomy. Given the mediating role of job satisfaction, organizations should also monitor employee psychological well-being to maintain performance stability. However, this study is limited to permanent employees of PT Vale Indonesia and relies on cross-sectional questionnaire data, which may restrict generalization and fail to capture changes over time. Future research is recommended to include additional variables such as safety culture or transformational leadership, examine moderating factors across job levels or tenure, and apply longitudinal approaches to better understand the dynamics of employee perceptions and performance in the extractive industry.

FUNDING STATEMENT: This research did not receive any specific grant from funding agencies in the public, commercial, or not - for - profit sectors.

CONFLICTS OF INTEREST: The author declares no conflict of interest.

DECLARATION OF GENERATIVE AI STATEMENT: During the preparation of this work, the author(s) used ChatGPT, Grammarly, and Turnitin in order to enhance readability, check grammatical consistency, and evaluate textual similarity. After using this tool/service, the author(s) reviewed and edited the content as needed and take full responsibility for the content of the publication.

REFERENCES

- [1] Aljumah, A. (2023). The impact of extrinsic and intrinsic motivation on job satisfaction: The mediating role of transactional leadership. *Cogent Business & Management*, 10(3), 227-240.

- [2] Aslam, S., Saleem, A., Kumar, T., & Parveen, K. (2022). New normal: Emergence of situational leadership during COVID-19 and its impact on work motivation and job satisfaction. *Frontiers in Psychology, 13*(1), 919-931.
- [3] Bakker, A. B., & Demerouti, E. (2021). Job demands–resources theory: Ten years after the first review. *Journal of Psychosomatic Research, 142*(1), 110-123.
- [4] Brace, I. (2018). *Questionnaire design: How to plan, structure and write survey material for effective market research* (4th ed.). London: Kogan Page.
- [5] Elsafty, A., & Oraby, M. (2022). The impact of training on employee retention: An empirical research on the private sector in Egypt. *International Journal of Business and Management, 17*(5), 58-74.
- [6] Elshifa, A., Irfana, T. B., Hardianty, S., Yakin, I., & Yusup, M. (2024). Training and human resource development methods and effectiveness. *Jurnal Ilmiah Manajemen Kesatuan, 12*(6), 2709–2718.
- [7] Farida, U., Rapini, T., & Putro, R. L. (2024). Analysis of the effect of job satisfaction as an intervening variable on employee performance. *Jurnal Ilmiah Manajemen Kesatuan, 12*(3), 867–876.
- [8] Gagne, M., Parker, S. K., & Griffin, M. A. (2022). Self-determination theory in the workplace: New directions in motivation and performance research. *Annual Review of Organizational Psychology and Organizational Behavior, 9*(1), 133–158.
- [9] Gandung, M. (2024). The influence of discipline and work motivation on employee performance. *International Journal Multidisciplinary Science, 3*(1), 51-58.
- [10] Gerhart, B., & Fang, M. (2015). Pay, intrinsic motivation, extrinsic motivation, performance, and creativity in the workplace: Revisiting long-held beliefs. *Annu. Rev. Organ. Psychol. Organ. Behav., 2*(1), 489-521.
- [11] Ghanbaripour, A. N., Talebian, N., Miller, D., Tumpa, R. J., Zhang, W., Golmoradi, M., & Skitmore, M. (2024). A systematic review of the impact of emerging technologies on student learning, engagement, and employability in built environment education. *Buildings, 14*(9), 2769-2780.
- [12] Hair, J. F., Jr., Hult, G. T. M., Ringle, C. M., & Sarstedt, M. (2022). *A primer on partial least squares structural equation modeling (PLS-SEM)* (3rd ed.). Thousand Oak: Sage Publications.
- [13] Hoxha, S., & Ramadani, R. (2024). The impact of intrinsic motivation on the sustainable extra-role performance with the mediating role of job engagement. *Sustainability, 16*(17), 7643-7457.
- [14] Indriani, D. (2025). Balancing demands and resources: the role of psychological resilience in driving employee engagement. *Global Review of Tourism and Social Sciences, 1*(2), 145-157.
- [15] Kim, J., Chang, H., & Bell, B. S. (2025). Organizational-level training and performance: A meta-analytic investigation. *Journal of Management, 1*(2), 49-60.
- [16] Kirkpatrick, J. D., & Kirkpatrick, W. K. (2016). *Kirkpatrick's four levels of training evaluation*. Alexandria: ATD Press.
- [17] Koopmans, L., Bernaards, C. M., Hildebrandt, V. H., Schaufeli, W. B., de Vet, H. C. W., & van Mechelen, W. (2016). Conceptual frameworks of individual performance: A systematic review. *Journal of Occupational and Organizational Psychology, 89*(1), 1–29.
- [18] Kumar, R., & Singh, S. K. (2022). Competency mapping and performance: The role of training effectiveness in the mineral processing sector. *Journal of Management Development, 41*(4), 210–225.
- [19] Kwon, K., & Kim, T. (2020). An integrative literature review of employee engagement and innovative behavior: Revisiting the concept of HRM. *Human Resource Development Review, 19*(3), 259–289.
- [20] Manelkar, K. A., Iyer, R., Gupta, K., & Sampat, B. (2023). A relationship between perceived investment in temporary employee development and organizational performance: an empirical study. *Journal of Organizational Effectiveness: People and Performance, 10*(2), 265-292.
- [21] Mawardi, M. I., & Cahyadi, N. (2024). A strategy for improving human resources quality through training and brainstorming. *Jurnal Ilmiah Manajemen Kesatuan, 12*(6), 2629–2636.
- [22] Muzaki, F. I., Sari, W. U., Putri, I. K., Arianto, R. S., & Putra, R. S. (2023). Factors affecting performance employees: Motivation, leadership, environment work, organizational culture, and achievement work. *Greenomika, 5*(1), 52-60.
- [23] Otoo, F. N. K. (2021). Impact of human resource development (HRD) practices on pharmaceutical industry's performance: The mediating role of employee competencies. *European Journal of Training and Development, 45*(6/7), 602–622.
- [24] Pracoyo, N. A., Tubastuvi, N., Sanioso, S. B., & Wahyimi, S. (2022). Determinants of employee performance: The mediating role of job satisfaction. *International Journal of Research in Business and Social Science, 11*(2), 144-156.
- [25] Pradhan, S., & Jena, L. K. (2017). Does meaningful work explain the relationship between transformational leadership and innovative work behaviour? *Vikalpa, 42*(2), 97–110.
- [26] PT. Vale Indonesia Tbk. (2025). *Quarterly report Q3 2025: Navigating commodity volatility and operational challenges*. Retrieved on December 20, 2025, from <https://www.vale.com/indonesia/ir-publications>
- [27] Rachman, A., Wibisono, C., Khaddafi, M., & Titik, D. (2022). The effect of training, motivation and compensation on employee effectiveness through job satisfaction at port offices and port authorities Class Iii Kijang. *International Journal of Social Science, Educational, Economics, Agriculture Research and Technology, 1*(12), 653-662.
- [28] Rustina, E., Dermawan, A., Vidyaningrum, B., & Suwandi. (2025). The impact of job satisfaction and employee engagement on employee performance. *Jurnal Ilmiah Manajemen Kesatuan, 13*(3), 1859–1870.

- [29] Safitri, U. L., Widagdo, B., & Novianti, K. R. (2022). The influence of work motivation and workload on employee performance with job satisfaction as a mediation variable. *Jurnal Manajemen Bisnis dan Kewirausahaan*, 2(02), 120-128.
- [30] Saunders, M., Lewis, P., & Thornhill, A. (2019). *Research methods for business students* (8th ed.). London: Pearson.
- [31] Scanlan, J. N., & Hazelton, T. (2019). Relationships between job satisfaction, burnout, professional identity and meaningfulness of work activities for occupational therapists. *British Journal of Occupational Therapy*, 82(8), 464–473.
- [32] Sharma, A., Kumar, N., & Kimatha, J. B. (2024). Transforming motivation into competitive advantage: an empirical study. *Innovation Business Management and Accounting Journal*, 3(2), 288-292.
- [33] Susanto, P.C., Setyawati, A., Pahrudin, C., Sugiyanto, S., Lermatan, E. E., Saribanon, E., & Sihombing, S. (2025). Analysis assessment, training and counseling on employee performance is mediated by job satisfaction at cargo companies. *Jurnal Ilmiah Manajemen Kesatuan*, 13(4), 2319–2336.
- [34] Taber, K. S. (2018). The use of Cronbach's alpha when developing and reporting research instruments. *Chemistry Education Research and Practice*, 19(3), 649–665.
- [35] Thomas, K. W. (2009). *Intrinsic motivation at work: What really drives employee engagement*. Oakland: Berrett-Koehler Publishers.
- [36] Tobari, T. (2025). The impact of training, culture, and leadership on electronic performance. *Jurnal Ilmiah Manajemen Kesatuan*, 13(3), 1609–1620.
- [37] Voruganti, K. K. (2023). Competency planning & building for the organization's future requirements. *Journal of Artificial Intelligence, Machine Learning and Data Science*, 1(1), 144-147.
- [38] Waworuntu, E. C., Kainde, S. J., & Mandagi, D. W. (2022). Work-life balance, job satisfaction and performance among millennial and Gen Z employees: A systematic review. *Society*, 10(2), 384-398.
- [39] Weiss, D. J., Dawis, R. V., England, G. W., & Lofquist, L. H. (1967). *Manual for the Minnesota Satisfaction Questionnaire*. In *Minnesota Studies in Vocational Rehabilitation XXII*. Minnesota: University of Minnesota, Industrial Relations Center.
- [40] Yimam, M. H. (2022). Impact of training on employees performance: A case study of Bahir Dar university, Ethiopia. *Cogent Education*, 9(1), 210-222.