

Continuous Training, Job Satisfaction, and Turnover Intention: Toward a Sustainable Workforce in Indonesia's Smelter

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ARTICLE INFO

Research Paper

Article history:

Received: 5 July 2026

Revised: 25 July 2026

Accepted: 19 August 2026

Keywords: Continuous Training, Job Satisfaction; Turnover Intention; Employee Retention

ABSTRACT

Purpose – This study examines the effect of continuous training on turnover intention through the mediating role of job satisfaction among employees of one of the mineral processing (smelter) companies in Morowali, Indonesia, based on the Job Demands–Resources (JD-R) theory. **Methodology/approach** – A quantitative explanatory study with a cross-sectional design was conducted involving 155 permanent employees selected through purposive sampling. The data were analyzed using Partial Least Squares Structural Equation Modeling (PLS-SEM). **Findings** – Continuous training has a significant negative effect on turnover intention and a significant positive effect on job satisfaction. Job satisfaction also has a significant negative effect on turnover intention and partially mediates the relationship between continuous training and turnover intention. These findings indicate that continuous training can serve as an effective employee retention strategy by enhancing job satisfaction and reducing employees' intention to leave. However, the findings should be interpreted considering the cross-sectional design and data collected from a single organization. **Novelty/value** – This study extends the application of the Job Demands–Resources (JD-R) theory within the context of Indonesia's smelter industry by demonstrating the mediating role of job satisfaction in explaining how continuous training contributes to employee retention. The findings provide practical implications for organizations seeking to build a sustainable workforce through continuous employee development.

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INTRODUCTION

Employee retention has become a strategic concern for organizations because high employee turnover increases recruitment and training costs, disrupts operational continuity, and weakens organizational knowledge and productivity (Bothma & Roodt, 2013; Németh et al., 2024). The issue is particularly critical in capital-intensive industries, such as mineral processing, where organizations depend on highly skilled employees to maintain operational efficiency and workplace safety. Consequently, understanding the factors that reduce turnover intention has become an important priority for both researchers and practitioners.

Among various human resource development practices, continuous training has received considerable attention because it enables employees to continuously improve their knowledge, skills, and competencies while adapting to technological and organizational changes (Albtoosh et al., 2022; Nabi

et al., 2025). Continuous training also signals organizational support for employee development, which may encourage employees to remain with the organization. However, previous studies have reported inconsistent findings regarding the relationship between continuous training and turnover intention, indicating that the underlying mechanism explaining this relationship requires further investigation. This issue is evident in one of the integrated mineral processing (smelter) companies in Morowali, Indonesia. According to the company's Human Resources records, the turnover ratio declined from 15.56% in 2024 to 11.27% in October 2025. Despite this improvement, the turnover ratio remained above the company's internal target of 5%. More importantly, although total employee turnover decreased, voluntary turnover increased slightly, indicating that retaining employees continues to be a major organizational challenge.

Table 1. Employee Turnover Statistics (2024–2025)

Turnover Type	Total Employee Resign (Tahun)	
	2024	2025
Involuntary	75	33
Voluntary	101	105
Grand Total	176	138
Turnover Ratio	15,56%	11,27%
Attrition Rate		Attrition Rate
8,90%		8,57%

Source: Human Resources Department (October 2025).

To improve employee retention, the company has continuously expanded its investment in employee development through internal and external training programs. The number of training programs increased substantially from five programs in 2022 to 113 programs in 2025, accompanied by a significant increase in employee participation and consistently high training satisfaction. These findings demonstrate the organization's strong commitment to continuous learning and competency development.

Table 2. Development of Continuous Training Programs (2022–2025)

Year	Int. Part.	Ext. Part.	Total Part.	Int. Prog.	Ext. Prog.	Total Prog.	Satisfaction	Remarks
2022	55	7	62	3	2	5	No Record	Initial training system development
2023	521	139	660	14	16	30	No Record	Workforce capacity development
2024	2,150	342	2,492	37	62	99	4.44 (VS)	Competency development expansion
2025*	469	418	887	20	93	113	4.58 (VS)	Regulatory & technical certification

Source: Human Resources Department (October 2025).

Notes: Int. Part. = Internal Participants; Ext. Part. = External Participants; Int. Prog. = Internal Programs; Ext. Prog. = External Programs; VS = Very Satisfied. 2025 data represent the study cut-off period.

From a theoretical perspective, previous research has shown that training and development can be associated with turnover intention, but the nature and strength of this relationship may vary across contexts. Albitoosh et al. (2022) found that training satisfaction was associated with turnover intention through employee loyalty, while Pinnington et al. (2024) demonstrated relationships among skills training, job satisfaction, and turnover intention. Hoo et al. (2024) further showed that job satisfaction

and employee engagement can mediate the relationship between training and development investment and employee turnover. These findings suggest that the relationship between training and turnover intention may not be adequately explained by a direct pathway alone. However, the psychological mechanism through which continuous training is associated with turnover intention remains insufficiently examined, particularly through job satisfaction in technically demanding industrial environments.

This issue is particularly relevant in Indonesia's mineral processing (smelter) industry, where employees are exposed to technically demanding work, operational complexity, and continuous competency requirements. Although previous studies have examined training, job satisfaction, and turnover intention in various sectors, empirical evidence concerning their integrated relationship in the mineral processing context remains limited. Consequently, findings from other industries may not fully reflect the characteristics of employees working in high-skill and operationally demanding smelter environments. This represents a contextual and mechanism gap that warrants further empirical investigation.

Accordingly, this study examines the relationship between continuous training and turnover intention, with job satisfaction as a mediating variable, among employees one of a mineral processing (smelter) company in Morowali, Indonesia. Drawing on the Job Demands–Resources (JD-R) model, continuous training is conceptualized as a job resource that may contribute to positive employee outcomes through psychological mechanisms such as job satisfaction (Demerouti et al., 2001). The study contributes to the literature in three ways. First, it provides empirical evidence on the relationship between continuous training and turnover intention in the relatively underexamined context of Indonesia's mineral processing (smelter) industry. Second, it examines job satisfaction as a psychological mechanism linking continuous training and turnover intention, thereby moving beyond a simple direct-effect perspective. Third, it extends the application of the JD-R perspective by examining how a job resource such as continuous training is associated with turnover intention through an employee psychological mechanism. The novelty of this study lies in the integration and empirical testing of this pathway within a high-skill and operationally demanding mineral processing context, rather than in proposing a new theoretical model.

LITERATURE REVIEW

Job Demands–Resources Theory and Hypothesis Development

This study is grounded in the Job Demands–Resources (JD-R) model proposed by Demerouti et al. (2001). The JD-R model argues that every occupation is characterized by job demands and job resources that jointly influence employee well-being and work-related outcomes. Job resources refer to physical, psychological, social, or organizational aspects of work that facilitate goal achievement, stimulate personal growth, and reduce the negative consequences of job demands. Among these resources, opportunities for continuous learning and employee development are considered important organizational investments that enhance employees' competencies, motivation, and work engagement. Consequently, employees who perceive strong organizational support through continuous training are expected to develop more positive work attitudes and exhibit lower intentions to leave the organization.

Continuous Training and Turnover Intention

Continuous training provides employees with opportunities to acquire new knowledge, improve technical competencies, and adapt to changing organizational requirements. Within the JD-R framework, continuous training functions as a job resource because it strengthens employees' capability to perform their work effectively while reinforcing organizational support for career development. Employees who perceive greater developmental opportunities are therefore more likely to remain with their organization because they recognize long-term career benefits and experience greater confidence in performing their jobs. Previous studies have reported that employee development initiatives contribute to lower turnover intention by enhancing employees' attachment to the organization

(Albtoosh et al., 2022; Nabi et al., 2025). Based on this theoretical argument, the following hypothesis is proposed:

H1: Continuous training is negatively associated with turnover intention.

Continuous Training and Job Satisfaction

Continuous training is also expected to improve employees' job satisfaction. Participation in training programs enables employees to develop new competencies, perform their jobs more effectively, and perceive greater organizational support for their professional growth. According to the JD-R model, the availability of organizational resources contributes to positive psychological outcomes because employees feel valued and capable of meeting work demands. Employees who receive continuous learning opportunities are therefore more likely to evaluate their jobs positively and report higher levels of job satisfaction. This argument is supported by Albtoosh et al. (2022), who found that training significantly enhances employees' job satisfaction. Therefore, the following hypothesis is proposed:

H2: Continuous training is positively associated with job satisfaction.

Job Satisfaction and Turnover Intention

Job satisfaction has consistently been identified as one of the strongest predictors of employee retention. Employees who are satisfied with their work generally experience stronger organizational attachment, greater commitment, and lower intentions to seek employment elsewhere. From the JD-R perspective, job satisfaction reflects a positive motivational state resulting from adequate job resources and successful adaptation to work demands. Consequently, employees who report higher job satisfaction are less likely to develop turnover intention. Previous empirical studies have consistently demonstrated a significant negative relationship between job satisfaction and turnover intention (Bothma & Roodt, 2013; Gage et al., 2025). Accordingly, the following hypothesis is proposed:

H3: Job satisfaction is negatively associated with turnover intention.

The Role of Mediating Job Satisfaction

The JD-R model further suggests that the influence of job resources on organizational outcomes often occurs indirectly through employees' psychological responses. Continuous training not only strengthens employees' competencies but also creates positive work experiences that enhance job satisfaction. Employees who perceive greater satisfaction with their jobs are subsequently less likely to leave the organization. Accordingly, job satisfaction is expected to explain the mechanism through which continuous training contributes to employee retention. This argument is also supported by previous studies highlighting the mediating role of job satisfaction in the relationship between human resource practices and turnover intention. Therefore, the following hypothesis is proposed:

H4: Job satisfaction mediates the relationship between continuous training and turnover intention.

Based on the empirical phenomenon, research gaps, and the theoretical arguments presented above, this study proposes a conceptual model in which continuous training directly influences turnover intention and indirectly influences turnover intention through the mediating role of job satisfaction. The proposed conceptual framework is presented in Figure 1.

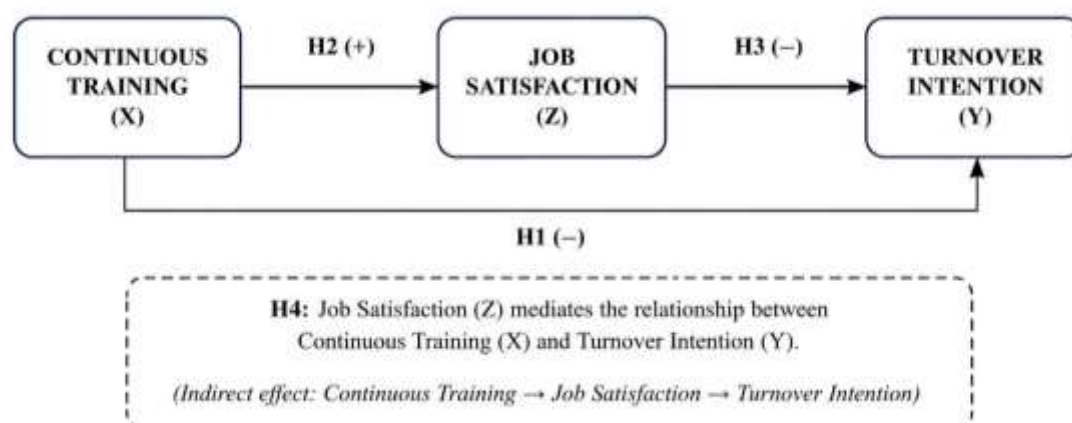


Figure 1. Conceptual framework

METHOD

This study employed a quantitative approach with an explanatory research design to examine the relationships among continuous training, job satisfaction, and turnover intention. The research was conducted in one of the integrated mineral processing (smelter) companies in Morowali, Indonesia. The study population comprised 1,224 employees, with a target population of 839 permanent Indonesian employees. Using purposive sampling, 155 respondents were selected based on three criteria: permanent employment status, a minimum tenure of one year, and participation in at least one internal or external training program. The sample size met the minimum recommendation for Partial Least Squares Structural Equation Modeling (PLS-SEM) (Hair et al., 2022). Data was collected through an online questionnaire administered via Microsoft Forms between 21 January and 11 February 2026.

The research instrument consisted of a structured questionnaire using a five-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree). Measurement items for continuous training were adapted from Albtoosh et al. (2022) and Nabi et al. (2025), job satisfaction from Gage et al. (2025), and turnover intention from Bothma and Roodt (2013) and Németh et al. (2024). All constructs were modeled as reflective constructs, and the measurement items were adapted to the organizational context while preserving their original conceptual meanings.

Data was analyzed using SmartPLS 4 through the Partial Least Squares Structural Equation Modeling (PLS-SEM) approach. Following the recommendations of Hair et al. (2022), the analysis included the evaluation of the measurement model through indicator loadings, Average Variance Extracted (AVE), Cronbach's Alpha, Composite Reliability (CR), Fornell–Larcker criterion, Heterotrait–Monotrait Ratio (HTMT), and Variance Inflation Factor (VIF). The structural model was subsequently assessed using the coefficient of determination (R^2), effect size (f^2), and bootstrapping with 5,000 resamples to test the significance of the direct and indirect relationships at the 5% significance level.

RESULT AND DISCUSSION

Respondent Characteristics

Table 3. Respondent Characteristics

Characteristic	Dominant Distribution
Gender	Male (83%)
Age	20–30 years (56%)
Education	Senior High School (45%), bachelor's degree (34%)
Position	Non-Staff (51%), Officer (33%)
Organizational Tenure	1–3 years (90%)

Source: Research Data (2026).

Table 3 presents the demographic profile of the respondents. Of the 155 respondents, the majority were male (83%), aged between 20 and 30 years (56%), had a senior high school or bachelor's degree, and worked as non-staff or officer employees. Most respondents had one to three years of organizational tenure (90%), indicating that they had sufficient work experience and exposure to the company's continuous training programs. These characteristics are considered appropriate for examining the relationship between continuous training, job satisfaction, and turnover intention.

Descriptive Statistics

Descriptive analysis summarized respondents' perceptions of the study variables. The results show positive perceptions of continuous training (mean = 4.10) and relatively high job satisfaction (mean = 3.81), while turnover intention remained moderate (mean = 2.62). These findings indicate that although employees viewed the company's training practices favorably and reported satisfactory work experiences, their intention to leave had not been fully eliminated.

Measurement Model Evaluation

Table 4. Convergent Validity

Construct	Indicator	Factor Loading	AVE
Continuous Training (X)	X1	0.662	0.591
	X2	0.787	
	X3	0.849	
	X4	0.859	
	X5	0.727	
	X6	0.708	
Job Satisfaction (Z)	Z1.1	0.762	0.583
	Z1.2	0.663	
	Z1.3	0.787	
	Z1.4	0.763	
	Z1.5	0.773	
	Z1.6	0.824	
Turnover Intention (Y)	Y1	0.680	0.653
	Y2	0.812	
	Y3	0.918	
	Y4	0.873	
	Y5	0.793	
	Y6	0.750	

Source: SmartPLS Output (2026).

Table 4 shows that the factor loadings range from 0.662 to 0.918, indicating acceptable indicator reliability. The AVE values for Continuous Training (0.591), Job Satisfaction (0.583), and Turnover Intention (0.653) are all above the recommended threshold of 0.50. Therefore, all constructs demonstrate satisfactory convergent validity.

Table 5. Measurement Model Evaluation

Construct	Cronbach's Alpha	Composite Reliability	Result
Continuous Training	0.859	0.896	Valid & Reliable
Job Satisfaction	0.858	0.893	Valid & Reliable
Turnover Intention	0.891	0.918	Valid & Reliable

Source: SmartPLS Output (2026).

Table 5 indicates that the Composite Reliability values range from 0.893 to 0.918, while Cronbach's Alpha values range from 0.858 to 0.891. All values exceed the recommended threshold of 0.70, indicating satisfactory internal consistency reliability for all constructs.

Table 6. Heterotrait–Monotrait Ratio (HTMT)

Construct	Continuous Training	Job Satisfaction	Turnover Intention
Continuous Training	–		
Job Satisfaction	0.820	–	
Turnover Intention	0.818	0.812	–

Source: SmartPLS 4 Output (2026).

Table 5 shows that all HTMT values are below the recommended threshold of 0.85, ranging from 0.812 to 0.820. Therefore, the measurement model demonstrates satisfactory discriminant validity (Hair et al., 2022).

Table 7. Fornell–Larcker Criterion

Construct	Continuous Training	Job Satisfaction	Turnover Intention
Continuous Training	0.769		
Job Satisfaction	0.717	0.764	
Turnover Intention	-0.725	-0.731	0.808

Source: SmartPLS 4 Output (2026).

The Fornell–Larcker criterion also confirmed discriminant validity, as the square root of the AVE for each construct exceeded its correlations with the other constructs. These findings were further supported by the HTMT values, all of which were below the recommended threshold of 0.85 (Hair et al., 2022).

Structural Model Evaluation Inner Model

Table 8. Goodness of Fit

Fit Index	Saturated Model	Estimated Model
SRMR	0.070	0.070
d_ULS	0.827	0.827
d_G	0.337	0.337
Chi-square	288.027	288.027
NFI	0.835	0.835

Source: SmartPLS 4 Output (2026).

The model fit assessment shows an SRMR value of 0.070 for both the saturated and estimated models, indicating an acceptable model fit. The NFI value of 0.835 also indicates an adequate level of model fit for the PLS-SEM analysis.

Table 9. Determinant Coefficient R-Square

Endogenous Construct	R ²	Adjusted R ²
Job Satisfaction (Z)	0.514	0.511
Turnover Intention (Y)	0.618	0.613

Source: SmartPLS 4 Output (2026).

The R-square results indicate that Continuous Training explains 51.4% of the variance in Job Satisfaction, while Continuous Training and Job Satisfaction jointly explain 61.8% of the variance in

Turnover Intention. The remaining 48.6% and 38.2%, respectively, are explained by factors outside the model.

Table 10. Effect Size (f^2)

Structural Path	f^2	Effect Size
Continuous Training → Job Satisfaction	1.058	Large
Continuous Training → Turnover Intention	0.216	Medium
Job Satisfaction → Turnover Intention	0.241	Medium

Source: SmartPLS 4 Output (2026).

The effect size analysis indicates that Continuous Training has a large effect on Job Satisfaction ($f^2 = 1.058$). Meanwhile, Continuous Training has a medium effect on Turnover Intention ($f^2 = 0.216$), while Job Satisfaction also demonstrates a medium effect on Turnover Intention ($f^2 = 0.241$). These findings indicate that Continuous Training has a particularly substantial contribution to Job Satisfaction, while both Continuous Training and Job Satisfaction provide meaningful contributions to explaining Turnover Intention.

Table 11. Predictive Assessment Using PLSpredict

Indicator	Q^2_{predict}	RMSE PLS-SEM	RMSE LM	Predictive Comparison
Z1.1	0.252	0.853	0.877	PLS-SEM better
Z1.2	0.171	0.647	0.675	PLS-SEM better
Z1.3	0.326	0.658	0.659	PLS-SEM better
Z1.4	0.207	0.849	0.878	PLS-SEM better
Z1.5	0.368	0.720	0.737	PLS-SEM better
Z1.6	0.388	0.639	0.657	PLS-SEM better
Y1	0.172	0.724	0.754	PLS-SEM better
Y2	0.393	0.703	0.705	PLS-SEM better
Y3	0.443	0.655	0.667	PLS-SEM better
Y4	0.355	0.658	0.680	PLS-SEM better
Y5	0.297	0.718	0.743	PLS-SEM better
Y6	0.319	0.895	0.923	PLS-SEM better

Source: SmartPLS 4 Output (2026).

The PLSpredict results show that all indicators have positive Q^2_{predict} values, ranging from 0.171 to 0.443, indicating predictive relevance for both Job Satisfaction and Turnover Intention. Furthermore, the RMSE values generated by PLS-SEM are lower than those of the linear model (LM) benchmark for all indicators. These results indicate that the PLS-SEM model demonstrates meaningful out-of-sample predictive performance for the endogenous constructs.

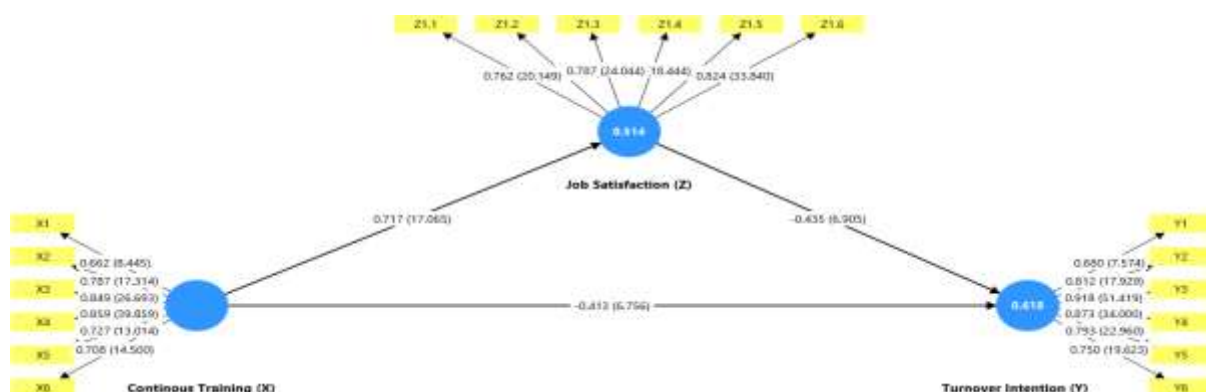


Figure 2. Bootstrapping Results of the Structural Model

The structural model was assessed using the coefficient of determination (R^2) and hypothesis testing through the bootstrapping procedure. The model explained 51.4% of the variance in job satisfaction and 61.8% of the variance in turnover intention, indicating a moderate level of explanatory power.

Table 12. Structural Model Results

Hypothesis	Relationship	β	t	p	Decision
H1	Continuous Training → Turnover Intention	-0.413	6.756	0.000	Supported
H2	Continuous Training → Job Satisfaction	0.717	17.065	0.000	Supported
H3	Job Satisfaction → Turnover Intention	-0.435	6.905	0.000	Supported
H4	Continuous Training → Job Satisfaction → Turnover Intention	-0.312	5.888	0.000	Supported

Source: SmartPLS Output (2026).

The bootstrapping results indicate that all proposed hypotheses were supported. Continuous training had a significant positive effect on job satisfaction and a significant negative effect on turnover intention. Job satisfaction also demonstrated a significant negative relationship with turnover intention. Furthermore, the indirect effect analysis confirmed that job satisfaction significantly mediated the relationship between continuous training and turnover intention, suggesting that continuous training contributes to employee retention both directly and indirectly through enhanced job satisfaction.

Continuous Training and Turnover Intention

The findings indicate that continuous training has a significant negative effect on turnover intention, suggesting that employees who perceive greater opportunities for continuous learning are less likely to consider leaving the organization. This result supports the Job Demands–Resources (JD-R) theory, which argues that organizational resources enhance employees' motivation and resilience, thereby reducing withdrawal behaviors such as turnover intention (Demerouti et al., 2001). Continuous training not only improves employees' technical competencies but also reinforces the perception that the organization values their professional growth and long-term career development.

The findings are consistent with Albtoosh et al. (2022), Pinnington et al. (2024), and Wang and Jiang (2024), who reported that employee development initiatives contribute to lower turnover intention by strengthening employees' organizational attachment and improving their work experiences. The present study extends this evidence by demonstrating that continuous training is also an effective employee retention strategy within Indonesia's mineral processing (smelter) industry, where maintaining a competent workforce is essential for sustaining operational performance and technological capability.

Continuous Training and Job Satisfaction

The results further demonstrate that continuous training has a significant positive effect on job satisfaction. This finding suggests that employees who perceive training programs as relevant and beneficial are more likely to evaluate their jobs positively. From the perspective of the JD-R theory, continuous training represents an important job resource because it enables employees to develop competencies, perform their tasks more effectively, and adapt to changing work demands. Consequently, employees receiving adequate development opportunities are more likely to experience higher levels of job satisfaction.

This finding is consistent with previous studies by Hoo et al. (2024), Hosen et al. (2024), and Gage et al. (2025), which reported that organizational investment in employee development enhances employees' job satisfaction. Nevertheless, the present findings also imply that continuous training is not the sole determinant of job satisfaction. Other organizational factors, such as leadership, career development opportunities, organizational culture, and the work environment, may also influence

employees' overall evaluation of their jobs. Therefore, organizations should integrate continuous training with broader human resource management practices to maximize employee satisfaction.

Job Satisfaction and Turnover Intention

The findings reveal that job satisfaction has a significant negative effect on turnover intention, indicating that employees who are more satisfied with their jobs are less likely to intend to leave the organization. This result supports the motivational process proposed by the JD-R theory, whereby job resources foster positive psychological outcomes that ultimately reduce withdrawal behaviors (Demerouti et al., 2001). Employees who experience greater job satisfaction tend to develop stronger organizational attachment, greater work commitment, and a lower desire to seek alternative employment opportunities.

The findings are consistent with previous studies conducted by Gage et al. (2025), Hulu et al. (2024), Nelson and Fitriana (2024), and Sholahuddin et al. (2025), all of which identified job satisfaction as a key predictor of turnover intention. The present study reinforces these findings within the context of Indonesia's mineral processing industry, suggesting that employee retention strategies should not focus solely on competency development but should also ensure that employees experience positive work environments that foster long-term job satisfaction.

The Role of Mediating Job Satisfaction

The mediation analysis confirms that job satisfaction significantly mediates the relationship between continuous training and turnover intention. This finding suggests that the effectiveness of continuous training in reducing employees' intention to leave is achieved not only through direct competency development but also through its ability to improve employees' psychological evaluation of their work. Employees who perceive continuous learning opportunities as organizational support are more likely to experience higher job satisfaction, which subsequently reduces their intention to leave the organization. This finding provides empirical support for the JD-R theory by demonstrating that organizational resources influence behavioral outcomes through motivational and psychological processes rather than solely through direct effects (Demerouti et al., 2001). The results are also consistent with Jehanzeb et al. (2015), Hoo et al. (2024), and Gage et al. (2025), who reported that employee development contributes to stronger employee retention through improved job satisfaction. Unlike many previous studies that examined the direct effects of training on employee outcomes, the present study demonstrates that job satisfaction serves as an important psychological mechanism linking continuous training to turnover intention within Indonesia's mineral processing (smelter) industry. This finding highlights the importance of integrating continuous employee development with initiatives that foster positive work experiences to build a more sustainable and committed workforce.

CONCLUSION

This study examined the relationship between continuous training, job satisfaction, and turnover intention among employees of an integrated mineral processing (smelter) company in Morowali, Indonesia. The findings demonstrate that continuous training significantly reduces turnover intention both directly and indirectly through job satisfaction. Employees who perceive continuous training as beneficial are more likely to experience higher job satisfaction, which in turn decreases their intention to leave the organization. These findings support the Job Demands–Resources (JD-R) theory by confirming that continuous training functions as a strategic job resource that promotes positive employee attitudes and contributes to workforce retention. The study also extends the employee retention literature by providing empirical evidence from Indonesia's mineral processing industry, a context that has received limited attention in previous research.

From a practical perspective, organizations should view continuous training not merely as a competency development initiative but as an integral component of employee retention strategies. Designing training programs that are relevant to employees' work and career development may strengthen job satisfaction and encourage long-term organizational commitment. Nevertheless, this study is limited by its cross-sectional design and the use of self-reported data collected from a single organization, which may restrict the generalizability of the findings. Future research is encouraged to employ longitudinal designs, including organizations from different industries, and examine additional organizational and psychological factors that may further explain employees' turnover intention.

ACKNOWLEDGMENT

The author would like to express sincere gratitude to the management and employees of one of the integrated mineral processing (smelter) companies in Morowali, Indonesia, for granting permission to conduct this study and for their valuable participation in the data collection process. The author also extends appreciation to the academic supervisors and colleagues whose constructive comments and support contributed to the completion of this research. This research received no external funding and was fully supported by the author.

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