

MAPPING IDEA & LITERATURE FORMAT | RESEARCH ARTICLE

The Effect of Training and Work Environment on Employee Performance with Competence as an Intervening Variable: A Study of Employees in the Concentrating Division of PT Freeport Indonesia, Tembagapura

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ABSTRACT

This study examines the effects of Training and Work Environment on Employee Performance, with Competence as an intervening variable among employees of the Concentrating Division of PT Freeport Indonesia, Tembagapura. This study employs a quantitative approach with an explanatory research design. Data were collected through questionnaires distributed to employees, supported by Mandatory Training records and Key Performance Indicator (KPI) data. The population consisted of 550 employees, with a sample of 127 respondents selected using Proportionate Stratified Random Sampling. Data were analyzed using Partial Least Squares Structural Equation Modeling (PLS-SEM) with SmartPLS. The results show that Training has a positive and significant effect on Employee Performance and Competence. Work Environment has a positive and significant effect on Employee Performance but a positive and non-significant effect on Competence. Competence has a positive and significant effect on Employee Performance. Furthermore, Training has a positive and significant indirect effect on Employee Performance through Competence, whereas the indirect effect of Work Environment on Employee Performance through Competence is positive but non-significant. The findings indicate that Training and Competence are important factors associated with Employee Performance, while Competence significantly mediates the relationship between Training and Employee Performance but does not significantly mediate the relationship between Work Environment and Employee Performance.

Keywords: Training, Work Environment, Competence, Employee Performance.

I. Introduction

The transformation of the global business environment driven by digital technology, industrial automation, artificial intelligence, and Industry 4.0 has shifted organizational attention toward human capital as a source of competitive advantage. In a knowledge-based economy, organizational performance depends not only on financial and physical resources but also on the ability to develop employees' knowledge, skills, and capabilities. Human Capital Theory emphasizes that investment in employee development can improve

organizational performance, while the Resource-Based View considers knowledge, skills, experience, and capabilities as valuable resources that are difficult to imitate or replace (Kim et al., 2026; Maley, 2024). Employee performance is a key indicator of organizational effectiveness. Performance encompasses not only work outcomes but also work behaviors that contribute to organizational objectives (Aguinis, 2023). Armstrong (2023) explains that improving employee performance requires an integrated human resource development strategy, including relevant training, a supportive work environment, and competencies aligned with job requirements. Training enhances employees' knowledge and skills, the work environment provides conditions that support the application of these capabilities, and competence reflects the ability to integrate knowledge, skills, and work attitudes into task performance. These factors are particularly important in the mining industry, which is characterized by complex operations, high occupational risks, advanced technology, and strict safety requirements. The implementation of Mining 4.0 has encouraged mining companies to adopt automation, digital monitoring systems, big data analytics, and artificial intelligence. Consequently, companies must develop human resources capable of operating these technologies effectively and safely.

Training has been found to have a positive effect on employee performance and competence (Fahrozi et al., 2022; Ridwan, 2023; Wisastra & Sagala, 2016). Similarly, a conducive work environment can improve employee performance by supporting effective work behavior and the application of employee capabilities (Ningsi & Suryalena, 2024). Competence plays an important role in translating human resource development efforts into improved performance. According to Spencer and Spencer (1993), competence consists of characteristics such as knowledge, skills, self-concept, traits, and motives that are causally related to superior performance. Previous studies have shown that competence can mediate the effect of training on employee performance (Kahphi et al., 2017) and serve as a mechanism linking the work environment and training to performance (Ismail & Maulida, 2020). However, much of the existing research has focused on government institutions, service organizations, and manufacturing, while studies examining this mechanism in the mining industry remain relatively limited. The complex work characteristics, high operational risks, and strict safety standards of mining therefore provide an important context for further empirical investigation. This issue is particularly relevant to PT Freeport Indonesia, especially its Concentrating Division, which processes mined ore into concentrate before further refining. The division operates large-scale equipment, automated systems, continuous production processes, and strict occupational safety procedures. These conditions require employees to possess strong technical competence, problem-solving skills, procedural discipline, and safety awareness. To support employee development, PT Freeport Indonesia provides various mandatory training programs for employees of the Concentrating Division, including:

Table 1. Mandatory Training Programs

Code	Description
SFF001	Fire Fighting and Warden
SFT301	Working at Height
SFT032	Confined Space
SFT033	LOTOTO (Lockout, Tagout, Tryout)
SFT034	HWP (Hot Work Permit)
SFT100	Hazcom (Hazard Communication)
LNS068	Hand & Finger Injury Safety
L4E371	Radiation Work
SFT306	Manual Handling
SFT322	Fundamentals of Ergonomics

Source: Concentrating Division, PT Freeport Indonesia

The mandatory training programs indicate the company's substantial investment in developing employees' technical competence and safety behavior. However, the availability of training programs does not necessarily guarantee that the competencies acquired are optimally applied in daily work. Their

effectiveness may also depend on the work environment and the extent to which employees can apply their competencies in operational activities. This issue is reflected in the employee Key Performance Indicator (KPI) data for the Concentrating Division during 2023–2025.

Table 2. Key Performance Indicator (KPI) Data of the Concentrating Division

Year	KPI Target (%)	KPI Realization (%)	Remarks
2023	100%	91%	Not optimal
2024	100%	88%	Decreased
2025	100%	93%	Improved but target not achieved

Source: Concentrating Division, PT Freeport Indonesia

Table 2 shows that employee performance fluctuated during the 2023–2025 period. KPI realization declined from 91% in 2023 to 88% in 2024, before increasing to 93% in 2025. Despite the improvement, performance remained below the 100% target, indicating a persistent performance gap. This condition suggests that the company's human resource development efforts have not yet fully translated into optimal employee performance. The gap between training investment and performance achievement indicates that employee performance cannot be explained solely by the direct effects of training and the work environment. Training is expected to develop competence, while a supportive work environment enables employees to apply that competence effectively. Therefore, competence may function as an intervening mechanism through which training and the work environment influence employee performance. The novelty of this study lies in examining the relationships among training, work environment, competence, and employee performance within the mining industry, particularly in the Concentrating Division of PT Freeport Indonesia. By positioning competence as an intervening variable, this study seeks not only to examine the direct effects of training and the work environment on employee performance but also to explain how these factors contribute to performance through employee competence. The specific operational characteristics of the Concentrating Division, including advanced technology, high-risk activities, and strict safety standards, provide a distinctive context for examining this relationship. Based on the theoretical considerations, empirical phenomenon, and research gap described above, this study aims to analyze the effect of training and work environment on employee performance, with competence as an intervening variable among employees of the Concentrating Division of PT Freeport Indonesia, Tembagapura.

II. Literature Review and Hypothesis Development

2.1. Employee Performance

Employee performance is a key indicator used to assess the effectiveness of human resource management in achieving organizational objectives. It reflects not only the outcomes achieved by employees but also the behaviors and processes through which they contribute to organizational goals. From the perspective of Human Capital Theory, improved performance is a consequence of organizational investment in human capital through education, training, experience, and competency development (Becker, 1993). Aguinis (2023) defines performance as the behaviors and results that contribute to the achievement of organizational objectives, while Robbins and Judge (2023) describe it as the results achieved by individuals in carrying out their assigned responsibilities based on their abilities, efforts, and opportunities. Armstrong (2023) further explains that performance is a continuous process that aligns individual and organizational objectives through effective work outcomes, competency development, and continuous improvement. Thus, employee performance is a multidimensional concept encompassing both work outcomes and behaviors that support organizational effectiveness. In this study, employee performance refers to the extent to which employees of the Concentrating Division of PT Freeport Indonesia accomplish their duties and responsibilities in accordance with organizational targets, operational standards, and established performance indicators.

Employee performance is measured through several indicators that reflect both the achievement of work outcomes and employees' contributions to organizational effectiveness. Based on a synthesis of the performance management concepts proposed by Armstrong (2023), Aguinis (2023), Bernardin and Russell (2013), and Griffin et al. (2007), and considering the characteristics of work in the Concentrating Division of PT Freeport Indonesia, five indicators are used in this study: (1) achievement of work targets, which refers to employees' ability to accomplish assigned tasks in accordance with predetermined targets and deadlines; (2) quality of work results, which reflects the accuracy, consistency, and quality of work in accordance with organizational standards; (3) work productivity, which represents employees' ability to produce optimal outputs by utilizing available resources effectively and efficiently; (4) work initiative, which refers to employees' ability to take independent action, identify more effective ways of completing tasks, and initiate improvements without waiting for direction from supervisors; and (5) contribution to organizational goals, which reflects the extent to which employees' work contributes to the achievement of organizational objectives through individual performance, cooperation, commitment, and alignment between individual and organizational goals (Armstrong, 2023; Aguinis, 2023; Bernardin & Russell, 2013; Griffin et al., 2007). These five indicators are considered relevant for comprehensively representing employee performance in the operational context of the Concentrating Division of PT Freeport Indonesia.

2.2. Training

Training is a strategic human resource management function aimed at improving employees' knowledge, skills, and work behaviors so that they can perform their jobs effectively and meet organizational requirements. In a rapidly changing work environment characterized by technological development and increasing competition, training is not merely an administrative activity but an organizational investment in human capital. Human Capital Theory emphasizes that investment in individuals' knowledge, skills, and abilities can increase productivity and create value for organizations (Becker, 1993). Noe (2021) defines training as a planned effort by an organization to facilitate employees' learning of job-related competencies, including the knowledge, skills, and behaviors required to perform their jobs effectively. Dessler (2017) further explains that training provides employees with the basic skills needed to perform their jobs effectively, while Armstrong (2023) views training as a systematic process for developing the knowledge, skills, and work behaviors required to improve performance. Therefore, training can be understood as a systematic learning process designed to develop employee capabilities and support the achievement of organizational objectives. In this study, training refers to the organization's efforts to develop employee competencies and performance through various training programs, particularly mandatory training implemented by PT Freeport Indonesia to strengthen technical competence, compliance with occupational safety standards, and operational effectiveness.

Training is measured using five indicators adapted from the human resource development concept proposed by Armstrong (2023), namely the relevance of training materials to the job, training methods, instructor competence, opportunities to participate in training, and the application of training outcomes in the workplace. The relevance of training materials to the job refers to the extent to which the content corresponds to employees' duties, responsibilities, and work requirements, thereby facilitating the application of acquired knowledge. Training methods refer to the approaches used to deliver training materials and facilitate effective learning and participation. Instructor competence reflects the instructor's ability to master the subject matter, communicate it systematically, provide feedback, and relate the material to workplace situations. Opportunities to participate in training refer to the extent to which the organization provides employees with fair access to competency development programs according to their work and development needs. Finally, the application of training outcomes in the workplace, or transfer of training, refers to employees' ability to apply the knowledge, skills, and behaviors acquired during training to their daily work. These indicators collectively reflect the extent to which training is relevant, effectively delivered, accessible, and applicable to employees' actual work.

2.3. Work Environment

From the perspective of the Resource-Based View (RBV), a conducive work environment can be regarded as an internal organizational resource that creates value, is difficult to imitate, and supports competitive advantage by improving human resource productivity (Barney, 1991). Robbins and Judge (2023) define the work environment as the overall conditions surrounding employees that influence how they perform their jobs, including both physical conditions and social interactions within the organization. Armstrong (2023) similarly explains that the work environment encompasses physical conditions, work relationships, organizational culture, and management systems that collectively influence employees' work experiences and behaviors. Recent research also indicates that a conducive work environment contributes to employee engagement, well-being, and performance. Pradani and Utomo (2025) found that employee motivation does not necessarily translate directly into optimal performance but requires a supportive work environment to facilitate its effective implementation. Based on these perspectives, the work environment can be defined as the overall physical and non-physical conditions surrounding employees that influence their work behavior, comfort, safety, and performance. In this study, the work environment refers to workplace conditions that support employees in performing their duties safely, comfortably, and productively through adequate work facilities and harmonious working relationships.

The work environment is measured using five indicators adapted from the concept proposed by Robbins and Judge (2023) and adjusted to the characteristics of work at PT Freeport Indonesia, namely physical work environment conditions, work structure and workplace layout, interpersonal work relationships, organizational and supervisory support, and work safety and comfort. Physical work environment conditions refer to aspects such as lighting, temperature, air circulation, noise levels, cleanliness, and the availability of work facilities that affect employees' comfort and ability to perform their duties. Work structure and workplace layout refer to the arrangement of work areas, equipment, and work processes designed to facilitate coordination, workflow, and task efficiency. Interpersonal work relationships refer to the quality of interaction, communication, and cooperation among employees, which can foster a conducive work atmosphere and support collaboration. Organizational and supervisory support refers to the attention, guidance, resources, feedback, and assistance provided by the organization and supervisors to support employees in performing their duties and developing their capabilities. Finally, work safety and comfort refer to workplace conditions that provide employees with a sense of security and comfort while protecting them from potential hazards. This indicator is particularly relevant in the mining industry because it involves occupational safety procedures, the use of personal protective equipment, and compliance with company operating standards. Together, these five indicators provide a comprehensive representation of both the physical and non-physical dimensions of the work environment that influence employee performance.

2.4. Competence

Competence is a fundamental concept in human resource management that refers to an individual's ability to perform tasks effectively in accordance with organizational requirements. In a dynamic business environment characterized by technological advancement and increasing competition, organizations require employees who possess not only technical knowledge and skills but also problem-solving abilities, adaptability, and professional attitudes. From the perspective of Human Capital Theory, competence is an important component of human capital developed through education, training, work experience, and continuous learning. Organizational investment in human resource development is therefore directed toward improving employees' knowledge, skills, and capabilities to enhance their contribution to organizational performance. This view is supported by Kim et al. (2026), whose meta-analysis indicates a relationship between organizational training practices and improved organizational performance. From the Resource-Based View, Maley (2024) further explains that employee capabilities, including knowledge, skills, experience, and abilities, can serve as strategic organizational resources when they are valuable, rare, difficult to imitate,

and difficult to substitute. Accordingly, competence in this study refers to employees' knowledge, technical skills, problem-solving abilities, professional attitudes, and adaptability in performing their jobs effectively.

Competence is measured using five indicators based on a synthesis of the concepts proposed by Maley (2024), Armstrong (2023), Noe (2021), and Campion et al. (2019), adapted to the characteristics of work in the Concentrating Division of PT Freeport Indonesia. Work knowledge refers to employees' understanding of information, principles, procedures, and other knowledge required to perform their duties effectively. Technical skills refer to employees' ability to apply knowledge, methods, and work techniques in accordance with organizational operating standards. Problem-solving ability refers to employees' capacity to identify problems, analyze their causes, evaluate alternative solutions, and determine appropriate decisions in response to work-related challenges. Professional attitude refers to work behaviors characterized by responsibility, discipline, integrity, commitment, and compliance with organizational standards and ethics. Finally, adaptability refers to employees' ability to adjust to changes in the work environment, technological developments, operational procedures, and increasingly complex job demands. These five indicators represent both technical and behavioral dimensions of competence and are considered relevant to the operational characteristics of the Concentrating Division of PT Freeport Indonesia.

2.5. Conceptual Framework

a. The Relationship between Training and Employee Performance

Human Capital Theory views training as an organizational investment in human capital that enhances employees' knowledge, skills, and abilities, thereby improving productivity (Kim et al., 2026). Armstrong (2023) similarly states that training is a systematic process for developing employees' capabilities to perform their tasks effectively. At PT Freeport Indonesia, mandatory training aims not only to strengthen technical capabilities but also to improve compliance with safety procedures, thereby reducing operational errors and supporting productivity. This relationship is supported by Fahrozi et al. (2022) and Ridwan (2023), who found that training has a positive and significant effect on employee performance. Thus, more effective training is expected to improve employee performance.

H1 : Training has a positive and significant effect on employee performance in the Concentrating Division of PT Freeport Indonesia, Tembagapura.

b. The Relationship between Work Environment and Employee Performance

From the Resource-Based View perspective, the work environment represents an organizational condition that supports the effective utilization of human resources. A conducive environment enables employees to work safely, comfortably, and effectively, thereby supporting performance. Armstrong (2023) notes that a safe and supportive work environment, combined with positive interpersonal relationships, can enhance employee motivation, engagement, and work effectiveness. This relationship is also supported by Sitorus et al. (2025), who identified the work environment as a factor associated with employee performance. In the mining industry, including PT Freeport Indonesia, a safe work environment is particularly important due to the high level of operational risk.

H2 : Work Environment has a positive and significant effect on employee performance in the Concentrating Division of PT Freeport Indonesia, Tembagapura.

c. The Relationship between Competence and Employee Performance

Human Capital Theory views competence as the result of investments in human resources through education, training, experience, and continuous learning. Wibowo (2016) defines competence as the work capability based on the knowledge, skills, and work attitudes required to perform tasks effectively. Armstrong (2023) further explains that competence enables employees to perform effectively by applying appropriate

knowledge, skills, and behaviors. In the Concentrating Division of PT Freeport Indonesia, both technical competence and safety-related behaviors are essential for effective production processes. Therefore, higher employee competence is expected to result in better performance.

H3 : Competence has a positive and significant effect on employee performance in the Concentrating Division of PT Freeport Indonesia, Tembagapura.

d. The Relationship between Training and Competence

According to Human Capital Theory, training is an organizational investment that enhances the quality of human capital. Noe (2021) explains that training aims to improve employees' knowledge, skills, and work behaviors, thereby developing the competencies required by the organization. Armstrong (2023) further states that training is an essential component of human resource development aimed at reducing competency gaps.

H4 : Training has a positive and significant effect on Competence in the Concentrating Division of PT Freeport Indonesia, Tembagapura.

e. The Relationship between Work Environment and Competence

From the Resource-Based View perspective, a conducive work environment provides conditions that support competence development. An environment that facilitates learning, communication, collaboration, and feedback can accelerate the development of individual capabilities. Armstrong (2023) explains that a positive work environment encourages continuous learning, thereby supporting the development of employee competence.

H5 : Work Environment has a positive and significant effect on Competence in the Concentrating Division of PT Freeport Indonesia, Tembagapura.

f. The Relationship between Training and Employee Performance through Competence as an Intervening Variable

Human Capital Theory suggests that organizational investment in training can improve performance by first developing employee competence as a form of human capital, which is subsequently translated into higher productivity. Noe (2021) explains that training effectiveness is reflected in employees' ability to transfer acquired knowledge and skills to the workplace (transfer of training), which contributes to competence development. Spencer and Spencer (1993) further emphasize that competence represents underlying characteristics that enable individuals to demonstrate superior performance.

H6 : Training has a positive and significant effect on employee performance through Competence as an intervening variable in the Concentrating Division of PT Freeport Indonesia, Tembagapura.

g. The Relationship between Work Environment and Employee Performance through Competence as an Intervening Variable

The Resource-Based View suggests that the work environment provides organizational conditions that facilitate the development and effective utilization of employee competence. A safe environment that supports learning and collaboration can promote competence development, which subsequently contributes to work effectiveness. Wibowo (2016) defines competence as the ability based on knowledge, skills, and work attitudes that enables individuals to perform their duties effectively and achieve optimal work outcomes.

H7 : Work Environment has a positive and significant effect on employee performance through Competence as an intervening variable in the Concentrating Division of PT Freeport Indonesia, Tembagapura.

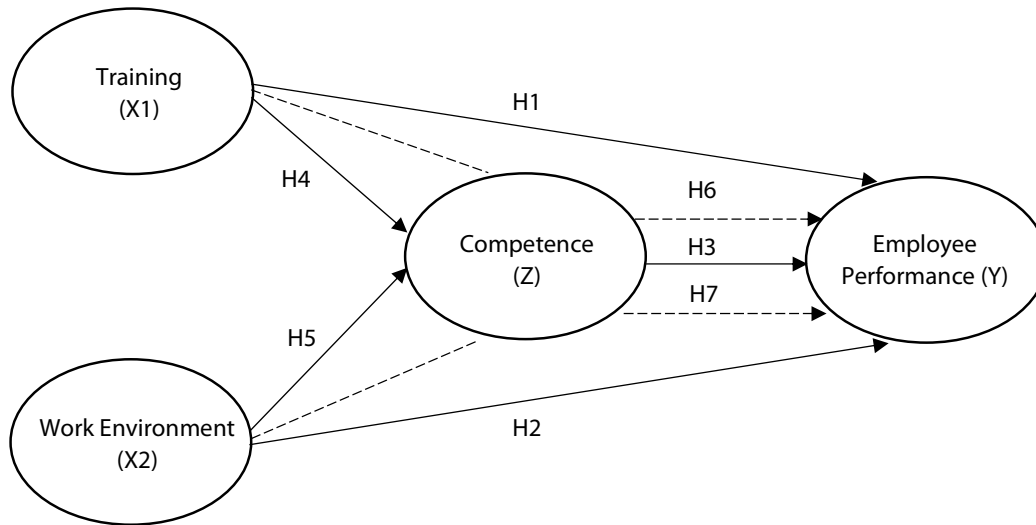


Figure 1. Conceptual Framework

III. Literature Review and Hypothesis Development

3.1. Research Method and Design

This study employs a quantitative approach using an explanatory research design to examine the effects of Training and Work Environment on Employee Performance, with Competence as an intervening variable. This approach was selected to obtain empirical evidence through measurable data and to explain the causal relationships among the research variables. According to Sugiyono (2016), data analysis is conducted to address research problems and test the proposed hypotheses.

3.2. Research Location and Period

This study was conducted in the Concentrating Division of PT Freeport Indonesia, Tembagapura, Mimika Regency, Central Papua Province. The research was conducted over a period of more than two months, covering data collection, data processing, and analysis of the research findings.

3.3. Population and Sample

a. Population

The population comprises all research subjects or objects with specific characteristics relevant to the study. Sugiyono (2022) defines a population as a generalization area consisting of subjects or objects with specific characteristics determined by the researcher for analysis and subsequent conclusions. The population of this study consists of all employees in the Concentrating Division of PT Freeport Indonesia, Tembagapura mining area, totaling 550 employees.

b. Research Sample

This study employs Proportionate Stratified Random Sampling because the employee population is heterogeneous, particularly in terms of job levels that may influence respondents' perceptions and research results. The population is divided into two strata: Supervisory Staff and Non-Supervisory Staff in the Concentrating Division of PT Freeport Indonesia, Tembagapura mining area. Proportional allocation is used

to ensure that each stratum is fairly represented in the sample, with 25% allocated to Supervisory Staff and 75% to Non-Supervisory Staff. The sample size is determined using the Slovin formula:

$$n = \frac{N}{1 + Ne^2}$$

Where:

- n = Sample size
- N = Population size
- e = Margin of error

Based on the calculation, the required sample consists of 127 respondents.

3.4. Types and Sources of Data

This study uses quantitative data consisting of numerical data that can be measured and statistically analyzed (Sugiyono, 2022). The data were collected through questionnaires distributed to employees of the Concentrating Division of PT Freeport Indonesia, Tembagapura mining area, covering the research variables of Training, Work Environment, Competence, and Employee Performance. In addition to primary data obtained directly from respondents through questionnaires, this study also uses secondary data obtained from the Mandatory Training records and Key Performance Indicator (KPI) data of the Concentrating Division. The collected data were subsequently processed and analyzed to examine the relationships among the research variables, while the secondary data were used as supporting information to strengthen the analysis and interpretation of the research findings.

3.5. Data Collection Method

Data were collected to obtain relevant information related to the research variables. The primary data collection technique used in this study was a questionnaire distributed to the respondents. The questionnaire served as the main research instrument for measuring respondents' perceptions of the variables under investigation. The questionnaire items were developed based on the predetermined indicators of each variable and systematically structured to ensure clarity and ease of understanding. A five-point Likert scale was used to measure respondents' perceptions of each statement. According to Sugiyono (2022), the Likert scale measures individuals' attitudes, opinions, and perceptions of social phenomena. The scale consisted of five response categories: Strongly Agree (5), Agree (4), Neutral (3), Disagree (2), and Strongly Disagree (1).

3.6. Data Analysis Technique

This study employs Partial Least Squares Structural Equation Modeling (PLS-SEM) as the data analysis technique. Structural Equation Modeling (SEM) is a multivariate statistical technique that combines factor and regression analyses to examine relationships among variables, both between indicators and their constructs and among latent constructs (Santoso, 2014). PLS-SEM was selected because it is suitable for relatively small sample sizes and does not require normally distributed data (Hair et al., 2022). It is also appropriate for predictive and complex research models, particularly for examining the role of Competence as an intervening variable. The PLS-SEM analysis consists of two main components: the outer model (measurement model), which assesses the relationships between indicators and their latent constructs through validity and reliability testing, and the inner model (structural model), which examines the relationships among latent constructs. The analysis was performed using SmartPLS.

a. Outer Model (Measurement Model)

The measurement model evaluates the validity and reliability of the research instrument. Validity assesses whether the instrument measures the intended construct, while reliability evaluates the consistency of the measurement and respondents' responses to the questionnaire items (Hair et al., 2022).

1) Validity Test

Validity indicates the extent to which an instrument accurately measures the intended construct. In PLS-SEM, validity is assessed through convergent validity and discriminant validity.

a) Convergent Validity

Convergent validity indicates the extent to which indicators measuring the same construct are positively correlated. It is assessed using outer loadings and Average Variance Extracted (AVE). An outer loading of ≥ 0.708 is generally considered acceptable, indicating that the construct explains at least 50% of the indicator's variance. An AVE value of ≥ 0.50 indicates that the construct explains more than half of the variance of its indicators. Indicators with loadings below 0.40 should be removed, while indicators with loadings between 0.40 and 0.70 should be evaluated based on their effects on AVE and composite reliability before being considered for removal (Hair et al., 2022).

b) Discriminant Validity

Discriminant validity assesses whether indicators of different constructs are sufficiently distinct. This study uses the Heterotrait-Monotrait Ratio (HTMT), with values below 0.90, or 0.85 under a more stringent criterion, indicating adequate discriminant validity (Henseler et al., 2015). Discriminant validity can also be assessed using cross-loadings, where each indicator should have a higher loading on its associated construct than on other constructs.

2) Reliability Test

The reliability test assesses the consistency of an instrument in measuring the same construct. A questionnaire is considered reliable when respondents provide consistent responses to its items. In this study, construct reliability was assessed using Cronbach's Alpha and Composite Reliability in SmartPLS. Cronbach's Alpha measures the internal consistency of indicators within a construct, while Composite Reliability is considered a more appropriate reliability measure for PLS-SEM. A construct is considered reliable when the Composite Reliability value is > 0.70 . Similarly, a Cronbach's Alpha value of ≥ 0.70 indicates good reliability, while values between 0.60 and 0.70 may be acceptable in exploratory research when supported by an adequate Composite Reliability value (Hair et al., 2022).

b. Inner Model (Structural Model)

The inner model is a structural model used to examine the relationships among latent constructs and assess the predictive relationships within the research model. The structural model is evaluated using several criteria, including R-square (R^2) and predictive relevance (Q^2). R^2 represents the proportion of variance in an endogenous construct explained by its predictor constructs. According to Chin and Marcoulides (1998), R^2 values of 0.67, 0.33, and 0.19 indicate strong, moderate, and weak explanatory power, respectively. Predictive relevance is assessed using Q^2 (Stone-Geisser's Q^2) through the blindfolding procedure. Q^2 values of 0.02, 0.15, and 0.35 indicate small, medium, and large predictive relevance, respectively. The Q^2 test is applicable to endogenous constructs measured using reflective indicators.

c. Hypothesis Testing

Hypothesis testing is conducted to examine the proposed relationships among the research constructs using PLS-SEM. The hypotheses are evaluated based on t-statistic and p-value. At a 5% significance

level, a hypothesis is supported when the t-statistic exceeds the critical value of 2.00 and the p-value is < 0.05. Accordingly, the alternative hypothesis (H_a) is accepted and the null hypothesis (H_0) is rejected when t-statistic > 2.00 and p-value < 0.05.

IV. Literature Review and Hypothesis Development

4.1. Analysis and Research Results

a. Outer Model Analysis (Measurement Model)

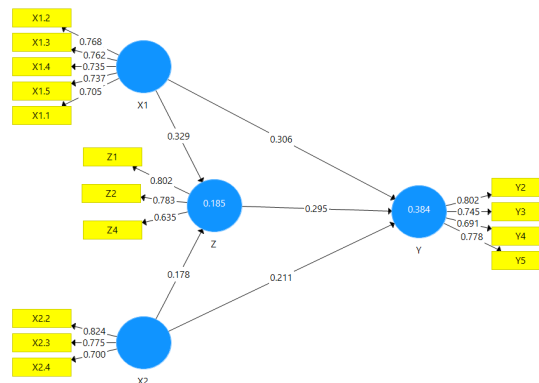


Figure 2. PLS Algorithm Output

The measurement model (outer model) was evaluated through convergent validity, discriminant validity, and reliability tests. The results are presented below.

a. Convergent Validity

The measurement model was evaluated by examining the outer loadings of each indicator. Indicators X2.1, X2.5, Y1, Z3, and Z5 were removed because their outer loading values did not meet the required criteria. After a stepwise evaluation, the final measurement model consisted of five indicators for Training (X1.1–X1.5), three indicators for Work Environment (X2.2–X2.4), three indicators for Competence (Z1, Z2, and Z4), and four indicators for Employee Performance (Y2–Y5). The final outer loading results are presented in Table 12.

Table 1. Outer Loading Results

Indicator	Employee Performance	Competence	Work Environment	Training
X1.2				0.768
X1.3				0.762
X1.4				0.735
X1.5				0.737
X2.2			0.824	
X2.3			0.775	
X2.4			0.700	
Y2	0.802			
Y3	0.745			
Y4	0.691			
Y5	0.778			
Z1		0.802		
Z2		0.783		

Z4		0.635		
X1.1				

Source: Processed data using SmartPLS 3

Most retained indicators had outer loading values above 0.70. However, Y4 (0.691) and Z4 (0.635) were retained because values above 0.60 can still be considered acceptable under certain conditions (Hair et al., 2022). Their retention was also supported by the AVE values of their respective constructs, all of which exceeded the minimum threshold of 0.50. The AVE results are presented in Table 13.

Table 2. Convergent Validity Test Using Average Variance Extracted (AVE)

Construct	Average Variance Extracted (AVE)
Employee Performance	0.571
Competence	0.554
Work Environment	0.590
Training	0.550

Source: Processed data using SmartPLS 3

All constructs obtained AVE values above 0.50, indicating that the measurement model meets the recommended criterion for convergent validity.

b. Discriminant Validity

Discriminant validity was assessed using the Heterotrait-Monotrait Ratio (HTMT). As shown in Table 14, all HTMT values ranged from 0.482 to 0.695, which are below the recommended maximum threshold of 0.90 (Henseler et al., 2015). The highest HTMT value was found between Competence and Employee Performance (0.695), while the lowest was between Competence and Work Environment (0.482). These results indicate that the constructs are sufficiently distinct and do not exhibit problematic overlap.

Table 3. Discriminant Validity Test Using HTMT

Construct	Employee Performance	Competence	Work Environment	Training
Employee Performance				
Competence	0.695			
Work Environment	0.606	0.482		
Training	0.605	0.569	0.528	

Source: Processed data using SmartPLS 3

Overall, the HTMT results confirm that the measurement model satisfies the discriminant validity criterion. Therefore, all constructs are sufficiently distinct and suitable for subsequent structural model (inner model) analysis. Discriminant validity was also assessed using cross loadings. An indicator satisfies this criterion when its loading on the construct it is intended to measure is higher than its loadings on other constructs. As shown in Table 4, each indicator has the highest loading on its respective construct. This confirms that the indicators represent their intended latent constructs better than the other constructs. Therefore, the cross-loading results further support the discriminant validity of the measurement model.

Table 4. Discriminant Validity Test Using Cross Loadings

Indicator	Employee Performance	Competence	Work Environment	Training
X1.1	0.339	0.298	0.179	0.705
X1.2	0.355	0.236	0.358	0.768
X1.3	0.363	0.223	0.275	0.762

X1.4	0.374	0.354	0.374	0.735
X1.5	0.424	0.338	0.234	0.737
X2.2	0.364	0.261	0.824	0.389
X2.3	0.310	0.258	0.775	0.312
X2.4	0.284	0.173	0.700	0.151
Y2	0.802	0.419	0.325	0.316
Y3	0.745	0.335	0.350	0.248
Y4	0.691	0.227	0.345	0.279
Y5	0.778	0.429	0.273	0.592
Z1	0.352	0.802	0.194	0.331
Z2	0.402	0.783	0.277	0.292
Z4	0.312	0.635	0.203	0.263

The cross-loading results show that all retained indicators have their highest loading on the corresponding construct. Thus, the measurement model satisfies the discriminant validity criterion and is suitable for further structural model analysis.

c. Reliability

Reliability testing was conducted to assess the internal consistency of the measurement instruments. As shown in Table 5.14, all constructs obtained Composite Reliability (CR) values above 0.70, namely 0.859 for Training, 0.811 for Work Environment, 0.786 for Competence, and 0.841 for Employee Performance. These results indicate good internal consistency and confirm that all constructs meet the reliability criterion. Cronbach's Alpha values were 0.797 for Training and 0.753 for Employee Performance, indicating satisfactory reliability. Meanwhile, Work Environment and Competence obtained values of 0.653 and 0.591, respectively. Although these values are below the conventional threshold of 0.70, they can still be considered acceptable in PLS-SEM when supported by Composite Reliability values above 0.70 and satisfactory convergent and discriminant validity results (Hair et al., 2022). The rho_A values ranged from 0.604 to 0.798, indicating adequate construct reliability and supporting the Composite Reliability results. Overall, the findings confirm that all constructs meet the reliability requirements and are suitable for subsequent structural model (inner model) analysis.

Table 5. Reliability Test Using Cronbach's Alpha and Composite Reliability

Construct	Cronbach's Alpha	rho_A	Composite Reliability
Employee Performance	0.753	0.774	0.841
Competence	0.591	0.604	0.786
Work Environment	0.653	0.668	0.811
Training	0.797	0.798	0.859

b. Inner Model Analysis (Structural Model)

The structural model was evaluated using the coefficient of determination (R^2), effect size (f^2), and predictive relevance (Q^2), also known as the Stone-Geisser criterion.

a. R-Square Test

Table 6. R-Square Test

Construct	R Square	Adjusted R Square
Employee Performance	0.384	0.369

Competence	0.185	0.172
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Table 17 shows that Competence has an R^2 value of 0.185 and an adjusted R^2 value of 0.172. This indicates that Training and Work Environment jointly explain 18.5% of the variance in Competence, while the remaining 81.5% is explained by other factors outside the model. Based on Hair et al. (2022), this represents a relatively weak explanatory power, suggesting that other factors may contribute to employee competence beyond Training and Work Environment. Employee Performance has an R^2 value of 0.384 and an adjusted R^2 value of 0.369. Thus, Training, Work Environment, and Competence jointly explain 38.4% of the variance in Employee Performance, while the remaining 61.6% is attributable to factors not included in the model. According to Hair et al. (2022), this indicates relatively moderate explanatory power, although other factors may still contribute to employee performance. Overall, the R^2 results indicate that the model provides explanatory power for the endogenous constructs, particularly Employee Performance, although a substantial proportion of the variance remains attributable to factors outside the model. Therefore, the analysis proceeds with effect size (f^2), predictive relevance (Q^2), and hypothesis testing.

b. F-Square Test

Table 7. F-Square (Effect Size) Test

Construct	Employee Performance	Competence	Work Environment	Training
Employee Performance				
Competence	0.115			
Work Environment	0.060	0.033		
Training	0.116	0.114		

Table 18 shows that Training has an f^2 value of 0.114 for Competence and 0.116 for Employee Performance. Work Environment has f^2 values of 0.033 for Competence and 0.060 for Employee Performance, while Competence has an f^2 value of 0.115 for Employee Performance. All f^2 values are below 0.15, indicating small effect sizes. This means that each exogenous construct contributes to the corresponding endogenous construct, although the individual contribution of each predictor is relatively limited. Nevertheless, these effects collectively contribute to the explanatory capability of the structural model (Hair et al., 2022). Overall, the f^2 results indicate that all hypothesized relationships contribute to the endogenous constructs, although their individual effect sizes are relatively small.

c. Q-Square Test

Table 8. Q-Square Predictive Relevance Test

Construct	SSO	SSE	$Q^2 (= 1 - SSE/SSO)$
Employee Performance	508.000	407.680	0.197
Competence	381.000	348.731	0.085
Work Environment	381.000	381.000	
Training	635.000	635.000	

Table 8 shows that Competence has a Q^2 value of 0.085, while Employee Performance has a Q^2 value of 0.197. Both values are greater than zero, indicating that the structural model has predictive relevance for the endogenous constructs. Based on Hair et al. (2022), a Q^2 value of 0.085 indicates small predictive relevance for Competence, whereas a value of 0.197 indicates moderate predictive relevance for Employee Performance. These findings suggest that Training and Work Environment contribute to predicting Competence, while Training, Work Environment, and Competence jointly provide greater predictive relevance for Employee Performance. Overall, the Q^2 results indicate that the structural model has adequate predictive capability for

the endogenous constructs. Therefore, the model is suitable for proceeding to hypothesis testing using bootstrapping to assess the significance of the relationships among the constructs.

c. Hypothesis Testing

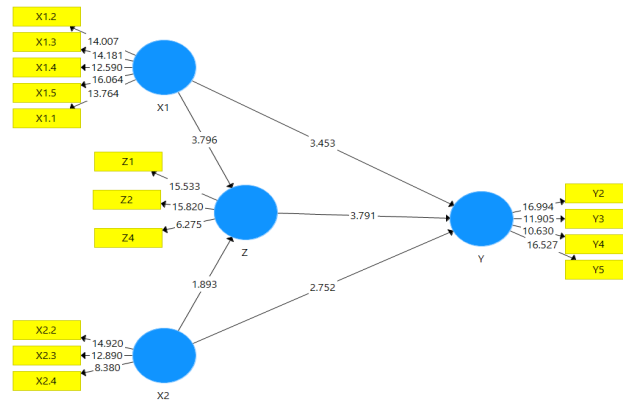


Figure 3. Bootstrapping Output

Hypothesis testing was conducted using the bootstrapping procedure to assess the significance of the direct and indirect effects among the constructs in the research model. A hypothesis is accepted when the t-statistic exceeds the critical value of 1.96 and the p-value is below 0.05 at the 5% significance level (Hair et al., 2022).

a. Direct Effects Test

Table 9. Hypothesis Testing of Direct Effects

Relationship	Original Sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	T Statistics (O/STDEV)	P Values
Training → Employee Performance	0.306	0.312	0.089	3.453	0.001
Work Environment → Employee Performance	0.211	0.218	0.077	2.752	0.006
Competence → Employee Performance	0.295	0.294	0.078	3.791	0.000
Training → Competence	0.329	0.339	0.087	3.796	0.000
Work Environment → Competence	0.178	0.188	0.094	1.893	0.059

Source: Processed data using SmartPLS 3

- 1) Training has a positive and significant effect on Employee Performance, with a path coefficient of 0.306, t-statistic of 3.453 (>1.96), and p-value of 0.001 (<0.05). Therefore, Hypothesis 1 is accepted, indicating that improved training contributes to higher employee performance in the Concentrating Division of PT Freeport Indonesia TembagaPura.
- 2) Work Environment has a positive and significant effect on Employee Performance, with a path coefficient of 0.211, t-statistic of 2.752 (>1.96), and p-value of 0.006 (<0.05). Therefore, Hypothesis 2 is accepted, indicating that a better work environment is associated with higher employee performance.

- 3) Competence has a positive and significant effect on Employee Performance, with a path coefficient of 0.295, t-statistic of 3.791 (>1.96), and p-value of 0.000 (<0.05). Therefore, Hypothesis 3 is accepted, indicating that higher employee competence contributes to improved performance.
- 4) Training has a positive and significant effect on Competence, with a path coefficient of 0.329, t-statistic of 3.796 (>1.96), and p-value of 0.000 (<0.05). Therefore, Hypothesis 4 is accepted, indicating that better training implementation contributes to higher employee competence.
- 5) Work Environment has a path coefficient of 0.178, with a t-statistic of 1.893 (<1.96) and a p-value of 0.059 (>0.05). Therefore, Hypothesis 5 is rejected, indicating that the work environment does not have a statistically significant effect on employee competence in the Concentrating Division of PT Freeport Indonesia Tembagapura. This suggests that improvements in the work environment alone may not be sufficient to significantly enhance employee competence.

b. Indirect Effects Test

Table 10. Hypothesis Testing of Indirect Effects

Relationship	Original Sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	T Statistics (O/STDEV)	P Values
Training → Competence → Employee Performance	0.097	0.100	0.038	2.538	0.011
Work Environment → Competence → Employee Performance	0.053	0.054	0.030	1.775	0.076

Source: Processed data using SmartPLS 3

- 1) The results show that Training has a positive and significant indirect effect on Employee Performance through Competence. The indirect path coefficient is 0.097, with a t-statistic of 2.538 (>1.96) and a p-value of 0.011 (<0.05). Therefore, Hypothesis 6 is accepted, indicating that Competence significantly mediates the relationship between Training and Employee Performance in the Concentrating Division of PT Freeport Indonesia Tembagapura.
- 2) The results show that the indirect effect of Work Environment on Employee Performance through Competence is positive but not statistically significant. The indirect path coefficient is 0.053, with a t-statistic of 1.775 (<1.96) and a p-value of 0.076 (>0.05). Therefore, Hypothesis 7 is rejected, indicating that Competence does not significantly mediate the relationship between Work Environment and Employee Performance in the Concentrating Division of PT Freeport Indonesia Tembagapura.

4.2. Discussion

a. The Effect of Training on Employee Performance in the Concentrating Division of PT Freeport Indonesia, Tembagapura

The hypothesis testing results show that Training has a positive and significant effect on Employee Performance in the Concentrating Division of PT Freeport Indonesia, Tembagapura. This is indicated by a path coefficient (original sample) of 0.306, a t-statistic of 3.453, which exceeds the t-table value of 1.98, and a p-value of 0.001, which is below the 0.05 significance level. Therefore, H1 is accepted. These findings indicate that improvements in the implementation and quality of training are associated with higher employee performance. The training provided by the company is mandatory and is frequently applied by employees in their daily work. The programs cover materials relevant to job requirements, such as LNS068 Hand & Finger Safety, which provides employees with appropriate procedures for preventing hand and finger injuries during work activities. Effective training also requires appropriate delivery methods, competent instructors, and practical demonstrations that enable employees to apply the acquired knowledge and skills correctly. Mandatory training aligned with employees' job requirements therefore represents organizational support

for continuous competence development. The findings indicate that training contributes to employee performance, although the path coefficient suggests a moderate effect. The positive relationship indicates that improvements in training quality are accompanied by improvements in employee performance. Thus, training is not the sole determinant of performance but represents an important component in developing employees' capabilities to perform their duties according to organizational standards. Theoretically, these findings are consistent with Human Capital Theory, which views training as an organizational investment in human capital. Such investment enhances employees' knowledge, skills, and abilities, which subsequently support productivity and performance. Kim et al. (2026), through a meta-analytic investigation, found that organizational-level training practices are associated with improved organizational performance, supporting the view that investment in employee development can contribute to performance outcomes. Noe (2021) further emphasizes that training effectiveness depends not only on program implementation but also on transfer of training, namely employees' ability to apply the knowledge and skills acquired through training in their actual work. Therefore, training that is relevant to job requirements is more likely to contribute to improved performance.

b. The Effect of Work Environment on Employee Performance in the Concentrating Division of PT Freeport Indonesia, Tembagapura

The hypothesis testing results show that the Work Environment has a positive and significant effect on Employee Performance in the Concentrating Division of PT Freeport Indonesia, Tembagapura. This is indicated by a path coefficient of 0.238, a t-statistic of 2.448, which is greater than the t-table value of 1.98, and a p-value of 0.015, which is below the 0.05 significance level. Therefore, Hypothesis 2 is accepted. This finding indicates that a better work environment is associated with higher Employee Performance. This finding is consistent with Sitorus et al. (2025), who found that the Work Environment has a positive and significant effect on worker productivity. A conducive work environment can facilitate task execution and support employees in achieving optimal performance. From the Resource-Based View (RBV) perspective, a supportive work environment represents an internal organizational resource that can enhance productivity and work effectiveness. Robbins and Judge (2023) explain that the work environment encompasses the physical and non-physical conditions that influence how employees perform their jobs. These conditions include adequate facilities and workplace structure, harmonious working relationships, effective communication, supervisory support, and a safe and comfortable atmosphere. Such conditions can help employees remain focused, reduce work-related errors, and improve task completion effectiveness. The positive effect of the Work Environment on Employee Performance is particularly relevant to the operational characteristics of the mining industry, which involves relatively high operational risks. In the Concentrating Division, employees are supported by adequate facilities, including control rooms equipped with automation and real-time monitoring systems, high-technology production equipment, and well-equipped analytical laboratories to maintain consistent production quality. The company also applies occupational safety standards and provides personal protective equipment (PPE) to support employee safety and comfort. In addition, 24-hour health services are available to help maintain employees' physical condition. Employee facilities also include a Mess Hall providing breakfast, lunch, and dinner services, as well as a supermarket and café.

c. The Effect of Competence on Employee Performance in the Concentrating Division of PT Freeport Indonesia, Tembagapura

The hypothesis testing results show that Competence has a positive and significant effect on Employee Performance in the Concentrating Division of PT Freeport Indonesia, Tembagapura. This is indicated by a path coefficient (original sample) of 0.295, a t-statistic of 3.876, which is greater than the t-table value of 1.98, and a p-value of 0.000, which is below the 0.05 significance level. Therefore, Hypothesis 3 is accepted. This finding indicates that higher employee Competence is associated with higher performance in carrying out tasks and responsibilities in the Concentrating Division. This finding is consistent with Maley (2024), who

explains that employee capabilities are important organizational resources encompassing knowledge, skills, experience, and individual abilities. These capabilities enable employees to perform their work effectively and contribute to organizational efficiency. Maley (2024) further emphasizes that employee capabilities can be strengthened through training, development, and continuous learning, enabling organizations to respond to change and improve their strategic position. Campion et al. (2019) similarly define Competence as a combination of technical skills, interpersonal skills, cognitive abilities, and individual characteristics that enable employees to perform effectively according to organizational requirements. Armstrong (2023) further explains that Competence is reflected in professional attitudes, including responsibility, integrity, discipline, and commitment to performing tasks according to organizational standards. Employees with professional attitudes are better able to maintain work quality, comply with operational procedures, and contribute consistently to organizational objectives. In addition, Noe (2021) emphasizes the importance of adaptability in modern workplaces, particularly the ability to adjust to changes in technology, work methods, and organizational demands. Adaptability enables employees to maintain effective performance in dynamic work environments. The positive effect of Competence on Employee Performance is particularly relevant to the characteristics of work in the Concentrating Division, which requires high technical competence, rapid decision-making, and strict compliance with operational and safety procedures.

d. The Effect of Training on Competence in the Concentrating Division of PT Freeport Indonesia, Tembagapura

The hypothesis testing results show that Training has a positive and significant effect on Competence in the Concentrating Division of PT Freeport Indonesia, Tembagapura. This is indicated by a path coefficient of 0.329, a t-statistic of 3.796, which is greater than the t-table value of 1.96, and a p-value of 0.000, which is below the 0.05 significance level. Therefore, Hypothesis 4 is accepted, indicating that better implementation of company training is associated with higher employee Competence. This finding is consistent with Human Capital Theory, which views training as an organizational investment in improving the quality of human capital. Armstrong (2023) explains that training is a systematic process for developing the knowledge, skills, and work behaviors required to meet job demands. Accordingly, training that provides job-relevant materials, effective learning methods, competent instructors, adequate participation opportunities, and opportunities to apply training outcomes can contribute substantially to employee Competence. The positive effect of Training on Competence can be explained by the relationship between the training and competence indicators examined in this study. Job-relevant training materials provide employees with knowledge related to mineral processing and operational procedures. A combination of theoretical and practical learning helps develop technical skills and problem-solving abilities, while competent instructors support comprehensive understanding and reinforce professional attitudes and compliance with company standards. Continuous training opportunities enable employees to update their competencies, while the application of training outcomes through transfer of training strengthens their adaptability to technological developments, changes in work procedures, and operational demands. Thus, the training indicators collectively contribute to the development of stronger employee Competence. In the Concentrating Division of PT Freeport Indonesia, this finding is particularly relevant because the company consistently provides various mandatory training programs, including Fire Fighting and Warden, Working at Height, Confined Space, LOTOTO (Lockout, Tagout, Tryout), HAZCOM (Hazard Communication), and Hand & Finger Safety. These programs equip employees with knowledge and skills to identify hazards, respond to emergencies, work safely in high-risk environments, control hazardous energy, understand chemical hazards, and prevent hand and finger injuries.

e. The Effect of Work Environment on Competence in the Concentrating Division of PT Freeport Indonesia, Tembagapura

The hypothesis testing results show that the Work Environment has a positive but non-significant effect on Competence in the Concentrating Division of PT Freeport Indonesia, Tembagapura. This is indicated by a path coefficient (original sample) of 0.178, a t-statistic of 1.893, which is lower than the t-table value of

1.96, and a p-value of 0.059, which is above the 0.05 significance level. Therefore, Hypothesis 5 is rejected. Although the positive coefficient indicates that a better Work Environment tends to be associated with higher Competence, the effect does not reach statistical significance. Conceptually, this finding indicates that the Work Environment does not directly and significantly determine employee Competence. Maley (2024) explains that employee capabilities include knowledge, skills, experience, and abilities that enable employees to perform their work effectively. These capabilities require structured development through training, continuous learning, and employee development. Thus, a safe, comfortable, and supportive Work Environment can facilitate work activities, but it does not necessarily improve employees' knowledge, skills, and abilities without systematic competency development. Robbins and Judge (2023) similarly explain that physical and non-physical work environments can improve comfort, communication, coordination, and teamwork, but Competence is also influenced by individual characteristics, learning opportunities, work experience, and adaptability. Therefore, the Work Environment functions primarily as a supporting factor rather than a direct determinant of Competence. This finding can also be interpreted through Herzberg et al.'s (1959) Two-Factor Theory. Work conditions, job security, interpersonal relationships, and organizational policies are classified as hygiene factors. Although these factors are important for preventing dissatisfaction and creating a comfortable and safe workplace, they do not directly increase individual capabilities or Competence.

The empirical context also indicates that employee Competence is developed primarily through training, work experience, continuous learning, repeated task performance, peer learning, operational problem-solving, and coaching and mentoring. The five competence dimensions examined in this study, namely work knowledge, technical skills, problem-solving ability, professional attitude, and adaptability, are therefore more directly related to these developmental processes than to the quality of the Work Environment itself. Although a comfortable environment can support employee well-being and reduce work fatigue, it does not automatically increase Competence. In a high-risk mining environment, employees also undergo mandatory medical check-ups and training before performing operational tasks, while periodic medical check-ups are conducted annually to ensure that employees remain fit for work. This finding implies that, in highly standardized organizations such as PT Freeport Indonesia, the Work Environment primarily functions as an enabling condition that allows operations to be conducted safely and effectively rather than as the main mechanism for developing Competence. Competence is more likely to develop through continuous workplace learning, work experience, professional interaction, technological adaptation, and individual development efforts. Therefore, PT Freeport Indonesia should maintain its existing Work Environment standards while strengthening workplace learning through coaching, mentoring, knowledge sharing, cross-functional learning, and diverse work experiences. These initiatives can provide employees with greater opportunities to develop work knowledge, technical skills, problem-solving abilities, professional attitudes, and adaptability on a continuous basis.

f. The Effect of Training on Employee Performance through Competence as an Intervening Variable in the Concentrating Division of PT Freeport Indonesia, Tembagapura

The specific indirect effect results show that Training has a positive and significant effect on Employee Performance through Competence as an intervening variable. The analysis produced an Original Sample coefficient of 0.097, a t-statistic of 2.538, which is greater than the t-table value of 1.96, and a p-value of 0.011, which is below the 0.05 significance level. Therefore, Hypothesis 6 is accepted. These findings indicate that Competence serves as a mechanism through which Training contributes to improved Employee Performance in the Concentrating Division of PT Freeport Indonesia, Tembagapura. Since the direct effect of Training on Employee Performance was also significant, Competence functions as a partial mediator. Thus, Training improves Employee Performance both directly and indirectly through the development of employee Competence. This finding indicates that the effectiveness of training programs is not determined solely by their implementation but also by the extent to which training develops Competence that can be applied in the workplace. Competence therefore serves as a transformation mechanism connecting the company's

investment in Training with improved Employee Performance. Effective Training can enhance work knowledge, technical skills, problem-solving abilities, professional attitudes, and adaptability. These competencies subsequently support employees in achieving work targets, producing quality results, increasing productivity, demonstrating initiative, and contributing to organizational objectives.

g. The Effect of Work Environment on Employee Performance through Competence as an Intervening Variable in the Concentrating Division of PT Freeport Indonesia, Tembagapura

The specific indirect effect results show that the Work Environment has a positive but non-significant effect on Employee Performance through Competence as an intervening variable. The analysis produced an Original Sample coefficient of 0.053, a t-statistic of 1.775, which is lower than the t-table value of 1.96, and a p-value of 0.076, which is above the 0.05 significance level. Therefore, Hypothesis 7 is rejected, indicating that Competence does not significantly mediate the effect of the Work Environment on Employee Performance in the Concentrating Division of PT Freeport Indonesia, Tembagapura. This finding presents an important pattern. Although the direct effect of the Work Environment on Employee Performance is positive and significant, and Competence also has a positive and significant effect on Employee Performance, the Work Environment does not have a significant effect on Competence. Consequently, the mediation pathway from Work Environment to Competence and then to Employee Performance is not statistically established. In other words, the Work Environment can directly support Employee Performance, while Competence can independently contribute to performance, but the Work Environment does not significantly increase Competence and therefore cannot be transmitted through Competence as a mediating mechanism. Conceptually, a variable can function as a mediator when the independent variable influences the mediator, which subsequently influences the dependent variable (Hair et al., 2022). In this study, the relationship between Competence and Employee Performance is significant, whereas the relationship between the Work Environment and Competence is not. As a result, the Work Environment → Competence → Employee Performance pathway is interrupted. Improving the Work Environment therefore does not produce a sufficient increase in Competence to generate an indirect improvement in Employee Performance. This finding can be interpreted from the Human Capital perspective, which views employees' knowledge, skills, and abilities as forms of capital that can be developed through organizational investment in human resource development.

V. Conclusion

Based on the findings of this study on the effects of Training and Work Environment on Employee Performance with Competence as an intervening variable in the Concentrating Division of PT Freeport Indonesia, Tembagapura, it can be concluded that Training, Work Environment, and Competence have a positive and significant effect on Employee Performance. Training also has a positive and significant effect on Competence, whereas Work Environment has a positive but non-significant effect on Competence. Furthermore, Training has a positive and significant indirect effect on Employee Performance through Competence, while Work Environment has a positive but non-significant indirect effect on Employee Performance through Competence. Overall, the findings indicate that Training and Competence play important roles in improving Employee Performance, while Work Environment primarily supports performance through its direct effect. Competence also serves as an important intervening mechanism linking Training to Employee Performance, but does not significantly mediate the relationship between Work Environment and Employee Performance. Therefore, PT Freeport Indonesia should maintain and continuously improve its training programs while strengthening competency development through coaching, mentoring, knowledge sharing, feedback, and experiential learning. The company should also foster a work environment that not only supports daily operations but also encourages continuous learning and competency development. For future researchers, further studies are recommended to examine other factors that may

influence employee Competence and Performance, particularly factors beyond the Work Environment, and to expand the research to other divisions or work units to provide broader insights into the determinants of employee Competence and Performance.

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