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THE INFLUENCE OF EDUCATION AND TRAINING ON EMPLOYEE CAREER DEVELOPMENT AT PT. ASAM JAWA MEDAN

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Abstract

Driven by the scarcity of empirical studies on specific competency determinants in the plantation industry, this study examines the impact of education and training on career advancement at PT. Asam Jawa Medan. Initial observations revealed a mismatch between employees' educational qualifications and job requirements, as well as inconsistency in the implementation of training programs. Adopting a quantitative design, the study involved 52 respondents selected through purposive sampling, with data collected via structured questionnaires and analyzed using multiple linear regression in SPSS. The results show that both education and training have a positive and significant effect on career development, and that their combined influence explains 50.5% of the variance in employees' career growth. These findings align with established human resource management theories and confirm that enhancing the quality of education and the effectiveness of training initiatives is critical for supporting career mobility in the plantation sector. The study concludes that organizations should raise recruitment standards, strengthen technical training, and implement transparent promotion systems to better align competencies with career pathways. Theoretically, the research contributes to the human resource management literature on career development, while practically it offers guidance for HR policy refinement and identifies avenues for future research on additional determinants such as work motivation, leadership, and organizational culture.

Keywords: Education; Training; Career Development; Human Resource Management; Plantation Industry.

INTRODUCTION

Amidst the backdrop of escalating global rivalry, it is imperative for organizations to regard education and training as strategic essentials designed to bolster human resource proficiency, rather than simply treating them as administrative formalities. (Prasasongko & Kuswinarno, 2024). Rapid changes in the work environment, mechanization of production tools, and administrative digitalization require companies to possess an adaptive and analytical workforce. Without sustainable human resource development, organizational effectiveness and competitiveness will be threatened by employees' inability to keep up with the times (Rahmayanti & Misral, 2024).

Education plays a fundamental role as a conceptual foundation for employees to comprehend work processes comprehensively. Rahmi (2020) asserts that the function of education is to transfer skills, knowledge, and habits in a structured manner, enabling individuals to adapt to technological and organizational changes. Furthermore, education provides the capacity for individuals to face complex challenges and make appropriate decisions in dynamic work situations (Fajriyani et al., 2023).

From a theoretical perspective, education extends beyond the mere dissemination of technical expertise to encompass the cultivation of character.. Hadiamsyah & Meidina (2025) define education as a knowledge acquisition process that shapes individual personality and integrity. This is reinforced by Bakhrudin et al, (2024), who state that education is a humanization process that transforms individuals into critical and moral members of society. Employees with good education tend to understand company policies more easily and participate in innovation.

In the escalating dynamics of global competition, companies can no longer rely solely on traditional skills or work experience. Rapid technological developments, mechanization of production tools, and digitalization of administrative processes demand Human Resources who possess analytical skills, technological mastery, and relevant technical competencies (Fauziah & Arnu, 2025). Conversely, low education is often associated with limitations in understanding work instructions, difficulties in following system updates, and low opportunities for development within the organizational career structure. This indicates that education is a fundamental factor inseparable from efforts to improve employee quality and career mobility (Wirawan et al., 2019).

In addition to education, training is a vital instrument that directly impacts the improvement of operational technical capabilities (Awaluddin, 2021). Mathis & Jackson (as cited in Saputra & Sudiro, 2017) define training as a systematic process to provide skills and behaviors needed to improve job performance. Training serves to bridge the gap between employees' current skills and the competency standards required to perform tasks effectively..

The importance of training is also linked to the company's long-term investment in building loyalty and productivity. Sinaga & Sitinjak (2022) emphasize that besides improving capabilities, training serves to build employee loyalty to the organization. Prasetyo et al. (2021) further note that vocational training significantly impacts career progression, as it affords individuals the chance to refine skills that align with industry requirements.

The issue of career development currently receives significant attention in human resource management because it encompasses competency growth and the fulfillment of self-actualization needs, not merely job promotion (Mokobombang & Natsir, 2024). Anggoro et al. (2023) explain that career development aims to help employees recognize their potential and desired career direction with company support. A clear career system can create high work motivation and reduce turnover rates.

However, empirical reality at PT. Asam Jawa Medan shows a significant competency gap. Based on preliminary company data, the workforce structure is dominated by secondary education graduates (SMA/SMK) at 53.80%, while employees with Bachelor's (S1) qualifications are only 19.20% and Diploma (D3) at 23.10%. This dominance of the workforce with secondary education implies slow adaptation to technological innovations and understanding of complex Standard Operating Procedures (SOPs). This mismatch between the educational qualifications of the majority of employees and the demands of industrial modernization hinders their career mobility opportunities to more strategic levels (Aulia et al., 2025).

Another identified problem is the suboptimal implementation of training programs. Many employees feel that the training they participated in has been inconsistent, not aligned with job requirements, and not followed by objective result evaluations. Training is often run merely as a formality to meet policy standards without significant impact on

competency improvement. This irregularity reduces the contribution of training to employee career readiness.

Previous research has extensively examined the relationship between education, training, and career development with varied results. Ahmad & Rizal (2022) found that education and training significantly improve employee career readiness and development. However, there is a research gap in this case study, where no specific research has examined the simultaneous influence of these two variables in a plantation environment that has unique operational characteristics and specific competency challenges..

This research gap needs to be bridged with relevant theoretical foundations to strengthen the study's novelty argument. Mandang et al. (2021) state that the combination of formal education and practical training is a fundamental element for creating job promotion opportunities. Additionally, Fabian et al. (2024) emphasize that individual performance driven by competence is a key indicator of readiness to take on greater responsibilities.

Drawing upon the stated problem and theoretical framework, this research concentrates on examining the impact of education and training on the career advancement of employees at PT. Asam Jawa Medan. The objective of this study is to furnish empirical proof regarding the degree to which these factors dictate career prospects, while also offering recommendations to help the company refine its promotion policies to ensure greater transparency and a focus on competency

METHODS

Utilizing a quantitative framework, this study prioritizes the accumulation and examination of numerical data to verify predetermined hypotheses. This methodological choice is driven by the necessity to objectively elucidate relationships among variables and to derive conclusions that can be generalized. Consistent with the views of Kumar (2023), the quantitative approach was selected for its focus on organized research design, methodical data acquisition strategies, and the formulation of scientifically quantifiable hypotheses, all of which guarantee the validity and reliability of the findings. The study took place at PT. Asam Jawa Medan, situated at Jl. Gajah Mada No. 40, Medan, spanning the period from November 2025 through January 2026.

The research design used is a survey with an associative approach to analyze the causal relationship between independent and dependent variables. The population in this study includes all employees working at PT. Asam Jawa Medan, totaling 52 individuals. Referring to Siagian (2021), determining the sample from this population is crucial to reading the reality of existing phenomena. The sampling method employed was purposive sampling, specifically a census, which involved utilizing the entire population as the sample because of its direct pertinence to the education and training variables under review.

The collection of data involved both primary and secondary sources. Primary data were gathered directly through field observations and the distribution of closed-ended questionnaires. The instrument utilized a 5-point Likert Scale, extending from "Strongly Disagree" (score 1) to "Strongly Agree" (score 5), to assess respondent attitudes and perceptions regarding the phenomena under investigation. As noted by Sugiyono (2021), the Likert Scale is an effective tool for accurately gauging individual or group opinions on social issues. Prior to proceeding with analysis, the validity of the instrument was confirmed via Pearson Product Moment correlation, while reliability was assessed using the Cronbach's Alpha technique, requiring a threshold greater than 0.60. Supporting secondary data were sourced from scientific publications and related literature.

To ensure calculation accuracy, data analysis was executed using the SPSS 25 statistical software. The analytical process commenced with classical assumption testing, incorporating normality verification via the Kolmogorov-Smirnov test and plot graphs, multicollinearity assessment by examining tolerance and VIF values, and heteroscedasticity detection using Scatter Plots.

As described by Sintia et al. (2022) the Kolmogorov-Smirnov test evaluates the sample distribution against a normal distribution that shares the same mean and standard deviation. Additionally, the P-Plot graph serves as a valuable visual aid for assessing normality; according to Muliani et al. (2024), data points that align with the diagonal line indicate a normal distribution. In terms of variable relationships, Nurcahya et al. (2024) state that multicollinearity tests are designed to identify correlations among independent variables, where a high degree of correlation signals the presence of multicollinearity. Finally, scatter plots are utilized to visually detect heteroscedasticity by observing the dispersion patterns between residual and predicted values (Silalahi et al., 2024).

Hypothesis testing was conducted using multiple linear regression analysis with the equation $Y = b_1X_1 + b_2X_2 + e$, as explained by Siagian (2021) as a development of simple regression to predict dependent variable values based on independent variables. The statistical analysis comprised the partial test (t_{test}), the simultaneous test (F_{test}), and the coefficient of determination (R^2) which were utilized to evaluate the model's capacity to account for the variance in the dependent variable

RESULTS

Correlations

		X1.1	X1.2	X1.3	X1.4	TOTAL_X1
X1.1	Pearson Correlation	1	,732**	,481**	,546**	,862**
	Sig. (2-tailed)		,000	,000	,000	,000
	N	52	52	52	52	52
X1.2	Pearson Correlation	,732**	1	,545**	,519**	,842**
	Sig. (2-tailed)	,000		,000	,000	,000
	N	52	52	52	52	52
X1.3	Pearson Correlation	,481**	,545**	1	,433**	,704**
	Sig. (2-tailed)	,000	,000		,001	,000
	N	52	52	52	52	52
X1.4	Pearson Correlation	,546**	,519**	,433**	1	,753**
	Sig. (2-tailed)	,000	,000	,001		,000
	N	52	52	52	52	52
TOTAL_X1	Pearson Correlation	,862**	,842**	,704**	,753**	1
	Sig. (2-tailed)	,000	,000	,000	,000	
	N	52	52	52	52	52

**. Correlation is significant at the 0.01 level (2-tailed).

Figure 1. Validity Test Results for Education (X^1)

This research included 52 employees from PT. Asam Jawa Medan. Demographic analysis indicates a predominance of male participants at 57.68%, compared to 42.31% for females. Regarding age distribution, the majority of respondents fall within the productive ranges of 31 to 35 years (23.08%) and 36 to 40 years (21.15%), reflecting a sufficient level of maturity and professional stability

Correlations

		X2.1	X2.2	X2.3	X2.4	X2.5	TOTAL_X2
X2.1	Pearson Correlation	1	,551**	,519**	,627**	,472**	,827**
	Sig. (2-tailed)		,000	,000	,000	,000	,000
	N	52	52	52	52	52	52
X2.2	Pearson Correlation	,551**	1	,708**	,502**	,378**	,804**
	Sig. (2-tailed)	,000		,000	,000	,006	,000
	N	52	52	52	52	52	52
X2.3	Pearson Correlation	,519**	,708**	1	,562**	,401**	,828**
	Sig. (2-tailed)	,000	,000		,000	,003	,000
	N	52	52	52	52	52	52
X2.4	Pearson Correlation	,627**	,502**	,562**	1	,281*	,759**
	Sig. (2-tailed)	,000	,000	,000		,044	,000
	N	52	52	52	52	52	52
X2.5	Pearson Correlation	,472**	,378**	,401**	,281*	1	,654**
	Sig. (2-tailed)	,000	,006	,003	,044		,000
	N	52	52	52	52	52	52
TOTAL_X2	Pearson Correlation	,827**	,804**	,828**	,759**	,654**	1
	Sig. (2-tailed)	,000	,000	,000	,000	,000	
	N	52	52	52	52	52	52

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

Figure 2. Validity Test Results for Training (X^2)

Correlations

		Y.1	Y.2	Y.3	Y.4	Y.5	TOTAL_Y
Y.1	Pearson Correlation	1	,419**	,369**	,460**	,429**	,720**
	Sig. (2-tailed)		,002	,007	,001	,002	,000
	N	52	52	52	52	52	52
Y.2	Pearson Correlation	,419**	1	,420**	,285*	,374**	,691**
	Sig. (2-tailed)	,002		,002	,041	,006	,000
	N	52	52	52	52	52	52
Y.3	Pearson Correlation	,369**	,420**	1	,474**	,499**	,767**
	Sig. (2-tailed)	,007	,002		,000	,000	,000
	N	52	52	52	52	52	52
Y.4	Pearson Correlation	,460**	,285*	,474**	1	,445**	,696**
	Sig. (2-tailed)	,001	,041	,000		,001	,000
	N	52	52	52	52	52	52
Y.5	Pearson Correlation	,429**	,374**	,499**	,445**	1	,773**
	Sig. (2-tailed)	,002	,006	,000	,001		,000
	N	52	52	52	52	52	52
TOTAL_Y	Pearson Correlation	,720**	,691**	,767**	,696**	,773**	1
	Sig. (2-tailed)	,000	,000	,000	,000	,000	
	N	52	52	52	52	52	52

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

Figure 3. Validity Test Results for Career Development (Y)

Reliability Statistics

Cronbach's Alpha	N of Items
,823	4

Figure 4. Reliability Test Results for Education (X^1)

Reliability Statistics

Cronbach's Alpha	N of Items
,828	5

Figure 5. Reliability Test Results for Training (X^2)

Reliability Statistics

Cronbach's Alpha	N of Items
,778	5

Figure 6. Reliability Test Results for Career Development (Y)

Before proceeding with hypothesis testing, the research instrument was subjected to data quality evaluation. The results of the validity test indicated that all items corresponding to Education (X^1), Training (X^2), and Career Development (Y) produced r_{count} values surpassing the r_{table} benchmark of 0.2732, thereby confirming their validity. Additionally, reliability testing via Cronbach's Alpha revealed coefficients for all variables exceeding 0.60 (X^1=0,823; X^2=0,828; Y=0,778), which affirms the consistency and reliability of the research instrument.

One-Sample Kolmogorov-Smirnov Test

		Unstandardized Residual
N		52
Normal Parameters[a,b]	Mean	,0000000
	Std. Deviation	2,11154969
Most Extreme Differences	Absolute	,058
	Positive	,058
	Negative	-,057
Test Statistic		,058
Asymp. Sig. (2-tailed)		,200[c,d]

a. Test distribution is Normal.
b. Calculated from data.
c. Lilliefors Significance Correction.
d. This is a lower bound of the true significance.

Figure 7. Kolmogorov-Smirnov Normality Test

The requirements for classical assumption testing were fully met. The Kolmogorov-Smirnov normality test produced a significance value of 0.200 (> 0.05), indicating that the data follows a normal distribution. In terms of multicollinearity, the results displayed a tolerance value greater than 0.10 and a VIF of less than 10, signifying

that there is no correlation between the independent variables. Moreover, the heteroscedasticity test using a Scatter Plot exhibited a random dispersion of data points without any distinct pattern , confirming that the regression model remains free from symptoms of heteroscedasticity.

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	5,791	2,028		2,856	,006		
	TOTAL_X1	,468	,096	,500	4,894	,000	,968	1,033
	TOTAL_X2	,348	,084	,423	4,140	,000	,968	1,033

a. Dependent Variable: TOTAL_Y

Figure 8. Multicollinearity Test Results

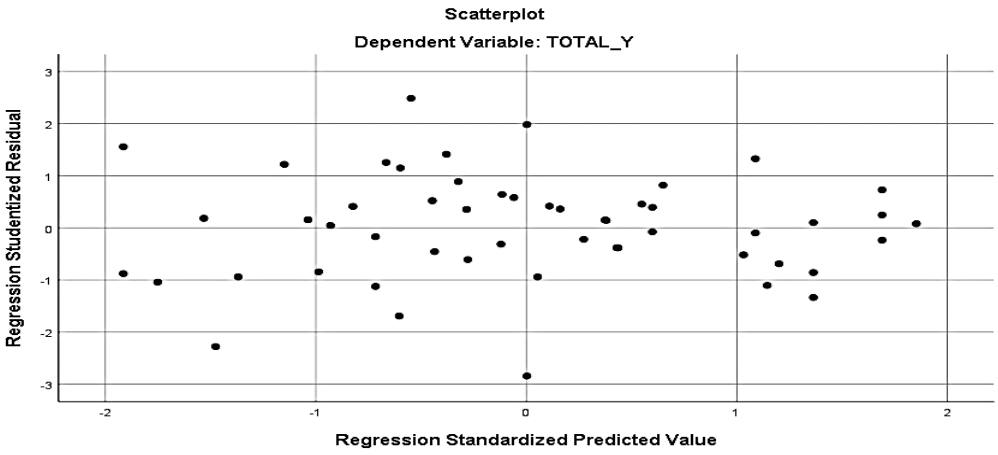

Figure 9. Heteroscedasticity Test Results

Multiple linear regression analysis was conducted to predict the influence of independent variables on the dependent variable. The obtained regression model is:

$$Y = 5{,}791 + 0{,}481X_1 + 0{,}348\,X_2$$

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	5,791	2,028		2,856	,006		
	TOTAL_X1	,468	,096	,500	4,894	,000	,968	1,033
	TOTAL_X2	,348	,084	,423	4,140	,000	,968	1,033

a. Dependent Variable: TOTAL_Y

Figure 10. Multiple Linear Regression Analysis

The regression equation identifies a constant of 5.791, which represents the projected level of career development assuming the variables for education and training are held at zero. The positive regression coefficients for education (0.468) and training (0.348) suggest that any improvement in these factors will result in a corresponding increase in employee career development.

The outcomes of the partial (t-test) and simultaneous (F-test) hypothesis tests are displayed in the table below.

Table 1. Partial Hypothesis Test Results (T-test)

Variabel	t_{hitung}	t_{tabel}	Sig.	Information
Education (X_1)	4,894	1,677	0,000	Significant
Training (X_2)	4,140	1,677	0,000	Significant

Table 2. Simultaneous Hypothesis Test Results (F Test)

F Test	f_{hitung}	f_{tabel}	Sig.	Information
X_1 & X_2 against Y	24,988	3,19	0,000	Significant

Based on the partial hypothesis test (t-test), the t_{count} value for education (4.894) and training (4.140) are both greater than t_{tabel} (1,677 , so the alternative hypothesis (H_1) is accepted. Simultaneously, the f-test shows that the f_{count} value (24,988) far exceeds f_{table} (3,19), confirming that both independent variables jointly influence career development. The coefficient of determination (R^2) was recorded at 0.505, meaning this model can explain 50.5% of the variation in career development, while the rest is explained by other factors outside the model.

DISCUSSION

Analysis of Results

Based on the comprehensive statistical testing conducted in this study, the variables of education and training empirically exert a positive and significant influence on employees' career development within PT. Asam Jawa Medan. The multiple linear regression analysis produced the mathematical equation $Y = 5.791 + 0.468X_1 + 0.348X_2$. The constant value of 5.791 indicates that when the education and training

variables are held constant or at zero, the baseline level of employees' career development already possesses an inherent foundational value of 5.791.

Partial testing through the t-test demonstrates that the education variable yields a calculated t_{value} of 4.894, exceeding the critical t_{table} threshold of 1.67655 at a five per cent significance level. The regression coefficient of 0.468 confirms that every one-unit increase in the quality or level of education enhances the probability of career development by 0.468 units. Empirically, this condition reflects the high urgency of academic background in shaping a strong conceptual framework, analytical capability, and cognitive maturity required to sustain the company's operational dynamics. When viewed from the demographic profile of employees at PT. Asam Jawa Medan, the dominance of senior high school or vocational graduates, accounting for 53.8 per cent of the total population, indicates substantial room for acceleration. Employees with adequate educational attainment are demonstrably more agile in adopting new technologies and mastering complex Standard Operating Procedures, thereby possessing a far more solid foundation for promotion to more strategic positions.

In testing the training variable, the statistical results reveal a calculated t-value of 4.140, which also lies significantly above the t-table value of 1.67655. The regression coefficient of 0.348 signifies that a one-unit increase in the intensity and effectiveness of training programmes corresponds to an increase in career development of 0.348 units. The company's operational data record that technical field training programmes dominate employee participation, reaching 42.3 per cent. This fact aligns with the objective demands of the plantation industry, which requires precise mastery of motoric and field-based technical skills. Training functions as a vital instrument for bridging competency gaps that are often overlooked within formal educational curricula.

Simultaneous verification through the F-test yields a calculated F_{value} of 24.988, which decisively exceeds the F-table value of 3.19. This result confirms that education and training do not operate in isolation; rather, they interact synergistically to generate a significant leverage effect on career development. The combination of these two variables records a coefficient of determination of 0.505. This metric clearly indicates that 50.5 per cent of the variation in the career advancement of employees at PT. Asam Jawa Medan is directly attributable to the quality of education and training they receive.

Literature Comparison

The empirical findings of this study exhibit a high degree of consistency with prior human resource management literature, while simultaneously addressing the research gap within the context of the palm oil plantation industry, which possesses distinctive operational dynamics. The results reinforce the postulate proposed by Ahmad and Rizal (2022), asserting that education and training constitute primary catalysts in shaping employees' promotion readiness and vertical mobility.

The positive correlation between the independent and dependent variables in this study is also congruent with the work of Patmarina et al (2022) , which validates that competency enhancement through structured training schemes is directly associated with employee performance and career progression. Furthermore, this study provides concrete empirical support for the hypothesis of Mandang et al. (2021) that the integration of academic intelligence derived from formal institutions with practical field expertise constitutes an indispensable prerequisite for organisations seeking to establish a healthy promotion system.

From the perspective of work readiness, the analytical results are in agreement with the findings of Saputra & Sudiro (2017), who emphasise that employee involvement in self-development programmes culminates in both mental and technical readiness to assume greater managerial responsibilities. In addition, the argument of Prasetyo et al. (2021) regarding the critical role of vocational training in aligning individual skills with contemporary industrial demands is proven to be valid and applicable within PT. Asam Jawa Medan. The convergence of these findings with previous scholarly studies strengthens the objectivity of the data, demonstrating that although the plantation industry is labour-intensive in nature, the fundamental principles of human resource development remain governed by universal competency management frameworks.

Implications of Findings

Theoretically, these findings reinforce human resource management principles, positing that the synergy between theoretical knowledge (education) and practical expertise (training) is fundamental to achieving career success. On a practical level, PT. Asam Jawa Medan is encouraged to integrate education and training policies directly into its promotion mechanisms. The company should develop a transparent, competency-driven career structure where training assessments and educational qualifications function as objective

criteria for performance evaluation. Furthermore, upgrading training programs to address specific technical and managerial needs is strongly recommended to fully leverage employee potential.

Despite the significant influence indicated by the regression model, it is important to acknowledge the study's limitations. The coefficient of determination (R^2) stands at 0.505, implying that 49.5% of the variance in career development stems from variables not analyzed in this research. Such external factors could include work experience, intrinsic motivation, leadership styles, organizational culture, and compensation schemes. Accordingly, future research should consider incorporating these additional variables to provide a more comprehensive perspective on the drivers of career development.

CONCLUSION

This study effectively confirms the crucial role of human resource capabilities in facilitating vertical career mobility within the plantation sector. Empirical evidence demonstrates that education and training, whether examined individually or concurrently, exert a positive and significant impact on the career progression of employees at PT. Asam Jawa Medan. Statistical analysis verifies that formal education establishes a robust conceptual framework enabling employees to grasp complex tasks, whereas effective technical training acts as a practical catalyst for the competencies required for promotion. Together, these two variables account for 50.5% of the variance in career development, reflecting a strong correlation. This suggests that the integration of academic credentials with ongoing skill enhancement is a primary determinant in establishing optimal career preparedness within the organization.

While this study offers sound empirical data, the interpretation of these results requires consideration of specific methodological and contextual constraints. First, the research is confined to a single entity (PT. Asam Jawa Medan) with a relatively small sample size (N=52); consequently, extending these findings to the broader plantation industry should be approached with caution. Second, the coefficient of determination (R^2) alue of 0.505 implies that 49.5% of the variance in career development remains unaccounted for by this model. This points to a "missing link" or additional latent variables beyond education and training that substantially influence employee career dynamics but were not captured in the current research design.

In light of the gaps highlighted by the residual values of the model, it is recommended that future studies investigate other potential exogenous variables. Subsequent researchers are encouraged to incorporate psychological and work environment factors, including intrinsic motivation, transformational leadership styles, organizational culture, and work experience, into the regression model to enhance the study's explanatory power. Moreover, broadening the population scope to include multiple companies within similar industrial sectors, or employing mixed-methods approaches, is strongly advised to achieve a more holistic comprehension of the complex and dynamic determinants of career development.

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