

## The Effect of Training, Development, and Innovative Work Behaviour on Employee Performance in the Heavy Equipment Industry

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### Article History

Received : 2024-07-19

Revised : 2024-11-19

Accepted : 2025-02-06

Published : 2025-05-14

### Keywords:

Training, Development, Innovative Work, Employee Performance

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### Paper type:

Research paper

### Cite this article:

Septyanur, A. D., Sukanda, J. M., Majdi, M. Z. I., Hanoum, S., & Saraih, U.M. (2023). The Effect of Training, Development, and Innovative Work Behaviour on Employee Performance in the Heavy Equipment Industry. *International Journal of Business and Management Technology in Society*, 1(2), 71-81.

### Abstract

**Purpose** – The study aims to determine the impact of training, development, and innovative work behavior on employee performance in the heavy machinery industry.

**Methodology** – This study employs an explanatory approach using a logistic regression model with data collected through questionnaires from 79 respondents working in a heavy machinery industry in Indonesia. The variables studied include training, development, and innovative work behavior as independent variables, and employee performance as the dependent variable.

**Findings** – The results show that training and development have a significant positive effect on employee performance ( $p < 0.05$ ), while innovative work behavior does not show a statistically significant impact ( $p > 0.05$ ). The Nagelkerke R Square value indicates that 23.2% of the variance in employee performance can be explained by the model.

**Practical implications** – From findings suggest that companies should focus on improving training and development programs to enhance employee performance. Meanwhile, efforts to foster innovative behavior may require a reevaluation of current strategies and organizational support mechanisms.

## Introduction

Employees are a crucial component of a company's success, acting as the driving force behind its progress. In the engineering and manufacturing sectors, particularly in the production of heavy equipment components and attachments, employees play a vital role in meeting the demands of the industrial, maritime, and energy sectors. Given the high level of mechanical activity in these industries, it is essential for employees to continually enhance their skills and capabilities to meet the evolving requirements of the company.

Employee competence can be developed through various company-initiated programs, with training and development being key among them. According to Kharim & Choudhury (2019), training programs are designed to maintain and improve current job performance, while development programs aim to enhance skills for future roles. These initiatives are critical in improving employees' abilities for both daily tasks and future challenges. As Abbas (2014)

noted, training programs significantly impact employee performance, leading to increased productivity and better customer service.

Improved employee performance is essential for sustaining a company's growth in its respective business fields. Training and development not only enhance employee competence but also fosters innovative work behavior. Sari & Amalia (2022) describe innovative work behavior as the initiation and implementation of new ideas, processes, products, or procedures. Such behavior is crucial for improving efficiency in work functions, which can reduce costs, enhance delivery, and improve quality, among other aspects. Shanker & Bhanugopan (2017) found that innovative work behavior directly impacts individual employee performance, highlighting its importance for organizational success.

In 2023, empirical data from a heavy equipment company showed that employees generated 202 improvement ideas, both technical and non-technical, demonstrating the value of innovative contributions. These ideas, documented according to company standards, underscore the positive impact of fostering a culture of innovation within the company.

This research aims to identify the variables that affect the performance of employees at a heavy equipment company. By exploring these questions, the research seeks to provide insights into the most effective strategies for enhancing employee performance and, consequently, organizational success.

## **Literature Review**

The influence of training, development, and innovative work behavior on employee performance has been a significant topic of interest among researchers, academics, and practitioners. Numerous studies have investigated the individual impacts of these variables on employee performance, yet there remains a gap in the literature concerning their combined effects. This section reviews relevant literature on each variable's impact on employee performance and identifies the research gap.

### **Training and Development**

Training and development are essential for organizations aiming to achieve their goals. Kharim & Choudhury (2019) emphasize that training programs are designed to maintain and improve current job performance, while development programs aim to enhance skills for future roles. These initiatives not only improve employees' abilities for daily tasks but also prepare them for future challenges. Training programs significantly impact employee performance, leading to increased productivity and better customer service (Abbas, 2014). Furthermore, employees rewarded with skill development and career advancement become valuable assets to the company, enhancing task effectiveness (Kharim & Choudhury, 2019).

### **Innovative Work Behavior**

Innovative work behavior is defined as individual actions that initiate and implement new ideas, processes, products, or procedures, contributing to group or organizational innovation (Sari & Amalia, 2022). Such behavior is crucial for improving efficiency in work functions, which can reduce costs, enhance delivery, and improve quality. Shanker & Bhanugopan (2017) found that innovative work behavior directly impacts individual employee performance, highlighting its importance for organizational success.

### **Research Gap and Proposed Model**

The above literature review underscores the importance of training, development, and innovative work behavior in enhancing employee performance. By addressing the identified research gap, this study aims to provide insights into the combined effects of these variables, offering valuable guidance for organizations seeking to enhance their employees' performance and overall organizational success.

Despite extensive research on training, development, and innovative work behavior, there is a lack of studies that combine these three variables to examine their collective impact on employee performance. Most existing research focuses on individual effects, leaving a gap in understanding how these variables interact and influence employee performance when considered together. This research aims to fill this gap by exploring the combined effects of training, development, and innovative work behavior on employee performance.

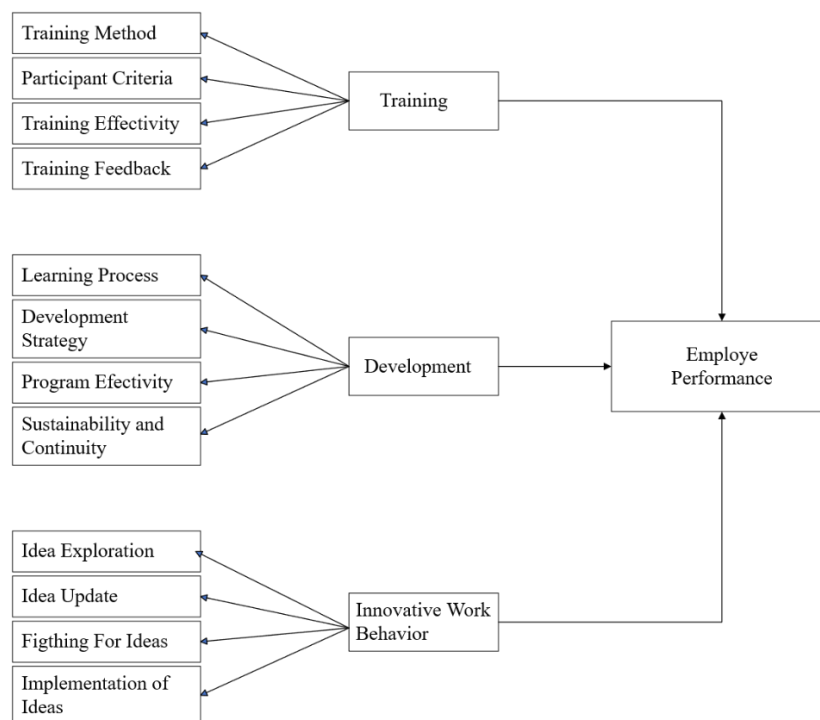


Figure 1: Conceptual Model

The first hypothesis (H1) training affects employee performance (Y), the second hypothesis (H2) development affects employee performance (Y), the third hypothesis (H3) innovative work behaviour affects employee performance (Y).

## Research Methods

### Type of Research

The type of research used in this study is explanatory research. Explanatory research is research that aims to analyse the relationships between one variable and another or how one variable affects another (Umar, 1999). The approach in this study is to use a logistic regression model approach by distributing questionnaires or questionnaires as research instruments. According to Ghozali (2005), logistic regression is suitable for research where the dependent variable is categorical (nominal or non-metric), and the independent variable is a combination of metric and non-metric. It aims to test the effect of independent variables on the dependent variable. In this study, to determine the effect of training, development and innovative behaviour as (independent variable) on employee performance as (dependent variable).

The research methods section describes the main stages and procedures of the research to investigate a research problem and the rationale for the application of specific procedures or techniques used to identify, select, process, and analyze information applied to understand the main problem of the research. In detail, research methods must be explaining the methods used, the influences that determined your approach, and why you chose samples, etc. This section must focus on answers about collected or generated data, and the process to analyze data with the relevant analytical tools. The writing should be direct and precise and always written in the past tense.

### Sample

The sample is part of the number and characteristics possessed by the research population (Sugiyono, 2018). In this study using one of the techniques in probability sampling is simple random sampling. Simple random sampling is the taking of sample members from a population that is carried out randomly without regard to the strata in that population (Sugiyono, 2018). By using the slovin formula in determining sampling, with the following formula:

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

Description:

$n$  : Number of samples

$N$  : Total population

$e$  : Error tolerance

In using this formula, determine what the error tolerance limit is. This error tolerance is expressed as a percentage. The smaller the error tolerance, the more accurately the sample describes the population. In this study, the percentage of tolerance error limit was 5%. The sample is taken based on random sampling in each department in the case company belong to a heavy equipment industry. Total sample data of 79 respondents were obtained from all departments. The distribution of samples obtained as in the Table 1.

Table 1. Population and sample data

Area	Quantity Manpower	Sampel Manpower	Rounding
Quality and Engineering	11	8,81	9
Marketing Officer	5	4,76	5
Assembly	6	5,66	6
Diassembly	11	9,90	10
Machining	34	25,37	25
Surface Machining	6	5,66	6
SCM and PPC	22	18,03	18
<b>Total</b>	<b>95</b>	<b>78,21</b>	<b>79</b>

### Research Variables

Independent Variables (X) are variables that affect the results related to the dependent variable. In this study there are three independent variables, namely Training (X1), Development (X2), and Innovative work behaviour (X3). As for the dependent variable (Y), the dependent variable is the variable that is influenced by the independent variable. The dependent variable in this study is Employee Performance (Y). Table 2 listed indicators for each variable.

Table 2. Variables and Indicators

Variable	Indicator
Training (X1) Mangkunegara (in Elizar, 2018)	Training Method Participant Criteria Training Effectiveness Training Feedback
Development (X2) Sinambela (in Arifianti, 2022)	Learning Process Development Strategy Programme Effectiveness Programme Sustainability and Sustainability
Innovative Work Behaviour (X3) De Jong & Den Hartog (2010)	Idea Exploration Idea Renewal Fighting for Ideas Idea Implementation

### Measurable

The variable measurement scale studied in this study uses a Likert scale. The Likert scale is used to measure respondents' attitudes, opinions, and perceptions of social phenomena (Sugiarto, 2017). The way of measurement is by confronting a respondent with a question or statement and then being asked to provide an answer. The scale answers in this study use a score of 1 to 5. So, with the Likert scale, 5 (five) answer options are used for each question. The indicators used in this Likert scale are as follows:

1. Score option 1 (Strongly disagree)
2. Score option 2 (Disagree)
3. Score option 3 (Moderately Agree)
4. Score option 4 (Agree)
5. Score option 5 (Strongly agree)

## Results and Discussion

### Validity Test

At the validity test stage, the results of  $r$  count are greater than  $r$  table, this is done to determine that the validity test qualifies as research material. This is also to ensure that respondents do not experience difficulties in filling out the questionnaire. Validity or validity refers to the extent to which a measuring instrument can measure precisely and accurately. The validity of an instrument or test is very important to ensure that the measurement results are in accordance with the intended measurement objectives. Thus, validity ensures that the instrument or test can measure what should be measured (Umar, 2003).

Table 3. Validity test results

Indikator	r hitung	r tabel	Keterangan
X1.1	0,585	0,1876	Valid
X1.2	0,574	0,1876	Valid
X1.3	0,795	0,1876	Valid
X1.4	0,625	0,1876	Valid
X2.1	0,582	0,1876	Valid
X2.2	0,818	0,1876	Valid
X2.3	0,713	0,1876	Valid
X2.4	0,544	0,1876	Valid
X3.1	0,642	0,1876	Valid
X3.2	0,601	0,1876	Valid
X3.3	0,719	0,1876	Valid
X3.4	0,636	0,1876	Valid
Y1	1	0,1876	Valid

**Source:** Data processing

From the above results, it can be concluded that all variables used in this study can be declared valid and can be measured.

**Reliability Test**

At the reliability test stage, it can inform that the possibility of an error can be very small if the alpha value obtained is more than 0.05. This can also be used to find out if one time it is carried out in future research it will produce the same results. Below are the results of the data from the reliability test.

Table 4. Reliability test result

Indicator	Cronbach's Alpha	N of Items
Training	.498	4
Development	.781	4
Innovative work behavior	.449	4
Performance employee	1.000	4

**Testing the overall model fit**

Table 5. The -2 log likelihood value which only consists of a constant

Iteration		-2 Log likelihood	Coefficients
			Constant
Step 0	1	97,053	,785
	2	97,020	,829
	3	97,020	,829

**Source:** Primary data processed, 2023

- Constant is included in the model.
- Initial -2 Log Likelihood: 97,020
- Estimation terminated at iteration number 3 because parameter estimates changed by less than ,001.

Table 6. The -2 log likelihood value which consists of constants and independent variables.

Iteration		-2 Log likelihood	Coefficients
			Constant
Step 0	1	97,053	,785
	2	97,020	,829
	3	97,020	,829

**Source:** Primary data processed, 2023

- Method: Enter
- Constant is included in the model.
- Initial -2 Log Likelihood: 97,020
- Estimation terminated at iteration number 5 because parameter estimates changed by less than ,001.

The SPSS output results in table 5 are the -2 log likelihood value consisting of constants only, explained in table 6 is the -2 log likelihood value consisting of constants and independent variables. The -2 log likelihood value that only includes constants is 97.053 while the -2 log likelihood value that includes constants and independent variables is 82.843. The comparison of the two -2 log likelihood values is 14.210. As shown in the Chi Square table in table 7 below.

Table. 7 Comparison of -2 log likelihood value omnibus tests of model coefficients

		Chi-square	df	Sig.
Step 1	Step	14,176	3	,003
	Block	14,176	3	,003
	Model	14,176	3	,003

**Source:** Primary data processed, 2023

Table 7 is a comparison display of -2 log likelihood values consisting of constants only (table 1) and -2 log likelihood consisting of constants and independent variables (table 2). The comparison follows the chi square distribution. The chi square value is 14.176 with df 3. Based on the table above, the Sig. Model of 0.003 because this value is smaller than 5%, it can be concluded that Training Development and Innovative Performance Behaviour significantly do not affect the Performance of Employees of PT UTPE. The coefficient of determination table (Nagelkerke R Square) The coefficient of determination is used to determine how much variability the dependent variable has. The coefficient of determination in logistic regression can be seen in Nagelkerke R Square. The Nagelkerke R value can be seen in the table below.

Table. 8 Coefficient of determination model summary

Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
1	82,843 <sup>a</sup>	,164	,232

**Source:** Primary data processed, 2023

The magnitude of the coefficient of determination in the logistic regression model is indicated by the Nagelkerke R Square value. The Nagelkerke R Square value is 0.232, which means that the variability of the dependent variable that can be explained by the independent variable is 23.2%, while the remaining 76.8% is explained by other variables outside the research model.

Table 8 Testing the Feasibility of the Regression Model To see whether the empirical data is in accordance with the model so that the model can be said to be fit, the suitability or feasibility of the regression model in this case is used Hosmer and Lemeshow's test with the following criteria:

- If the Hosmer and Lemeshow value  $< 0.05$  means that there is a significant difference between the model and its observations so that the goodness fit is not good, because the model cannot predict the value of the observations.
- If the value of Hosmer and Lemeshow  $> 0.05$  means that the model is able to predict the value of its observations, or it can be said that the model is acceptable because it matches the observation data. The Hosmer and Lemeshow Goodness of fit test can be shown in table 8 below.

Table. 9 Testing the appropriateness of the hosmer and lemeshow test model

Step	Chi-square	df	Sig.
1	6,651	8	,575

**Source:** Primary data processed, 2023

Table 9 shows the Chi Square value of 6.651 with a significance (p) of 0.575. Based on these results, because the significance value is greater than 0.05, there is no significant difference between the model and the observations, so the goodness fit is good, because the model can predict the value of the observations.

### Research Hypothesis Testing

Hypothesis testing is done through the Wald test by entering one by one the Training Development variable and innovative work behaviour into the employee performance variable. This test is to determine the effect of each independent variable on the dependent variable.

Table. 10 Wald Test Variables in the Equation

		B	S.E.	Wald	df	Sig.	Exp(B)
Step 1	X1	-,734	,254	8,364	1	,004	,480
	X2	,410	,188	4,773	1	,029	1,508
	X3	-,114	,184	,381	1	,537	,892
	Constant	8,413	4,263	3,894	1	,048	4504,833

**Source:** Primary data processed, 2023

a. Variable(s) entered step 1: X1, X2, X3.

Based on table 10, the test results are individually or partially as follows:

#### Variable (X1) Training

From Table 10, it is evident that the Wald value for the training variable is 8.364, with a significant value (sig) of 0.004. Since this significance value is less than the 0.05 (5%) threshold, we conclude that the hypothesis is accepted. This indicates that the training variable has a significant positive effect on improving employee performance. This finding aligns with Kharim and Choudhury (2019) and Abbas (2014), who highlighted the importance of training programs in enhancing employee performance and productivity.

#### Variable (X2) Development

According to Table 10, the Wald value for the development variable is 4.773, with a significance value (sig) of 0.029. Given that this significance value is below the 0.05 (5%) threshold, we conclude that the hypothesis is accepted. This result shows that the development variable significantly improves employee performance. This is consistent with the findings of Kharim and Choudhury (2019), who emphasized that development programs are crucial for skill enhancement and career advancement, thereby improving job performance.

#### Variable (X3) Innovative Work Behavior

Table 10 shows that the Wald value for the innovative work behavior variable is 0.381, with a significance value (sig) of 0.537. Since this significant value exceeds the 0.05 threshold, we conclude that the hypothesis is rejected. Therefore, the innovative work behavior variable does not have a significant effect on improving employee performance. This result contrasts with Shanker and Bhanugopan (2017), who found that innovative work behavior directly impacts employee performance. This discrepancy suggests that further research may be necessary to explore the conditions under which innovative work behavior influences performance.

The test results indicate that both training and development significantly improve employee performance, while innovative work behavior does not show a significant impact in



this study. This underscores the importance of focused training and development programs in enhancing employee capabilities and overall performance in the heavy equipment industry.

### **Managerial Implications**

The findings from this study offer several important managerial implications for the heavy equipment industry:

**Emphasize Training Programs:** The significant positive impact of training on employee performance underscores the need for companies to invest in robust training programs. Managers should ensure that training programs are regularly updated and aligned with the latest industry standards and technological advancements. By doing so, employees can maintain high levels of performance and adapt to new challenges effectively.

**Focus on Development Initiatives:** The significant effect of development on employee performance indicates that continuous professional development is crucial. Managers should create opportunities for employees to engage in development programs that enhance their skills and prepare them for future roles. This could include workshops, seminars, certification courses, and career development plans. Encouraging employees to pursue personal and professional growth can lead to higher job satisfaction and retention rates.

**Re-evaluate Innovative Work Behavior Strategies:** The lack of a significant impact of innovative work behavior on employee performance suggests that current strategies to foster innovation might need re-evaluation. Managers should investigate potential barriers to innovation within the organization and create an environment that supports and rewards innovative thinking. This might involve setting up dedicated innovative teams, offering incentives for creative solutions, and providing resources for experimenting with new ideas.

**Integrated Approach to Performance Enhancement:** Given that training and development significantly enhance employee performance, managers should adopt an integrated approach that combines these elements. A holistic strategy that includes regular training, continuous development, and efforts to encourage innovation can lead to sustained performance improvements. This comprehensive approach ensures that employees are not only skilled but also motivated to contribute innovative solutions to the company's challenges.

**Tailored Programs for Employee Needs:** Managers should tailor training and development programs to address specific needs identified through performance evaluations and feedback mechanisms. By customizing programs to meet individual employee needs, managers can ensure more effective learning outcomes and higher performance levels.

**Monitor and Adjust Programs:** Continuous monitoring and assessment of training and development programs are essential. Managers should use performance metrics and feedback to gauge the effectiveness of these programs and make necessary adjustments. This iterative process ensures that programs remain relevant and impactful over time.

**Foster a Culture of Continuous Improvement:** Finally, managers should cultivate a culture that values continuous improvement and learning. Encouraging employees to take ownership of their professional development and supporting their efforts can lead to a more engaged and high-performing workforce.

By focusing on these managerial implications, companies in the heavy equipment industry can enhance their employees' performance, drive organizational success and maintain a competitive edge in the market.

## Conclusion

This study has demonstrated that training and development significantly enhance employee performance in the heavy equipment industry. Specifically, training programs have been shown to improve employees' current job performance, while development initiatives prepare them for future roles. However, the study found that innovative work behavior does not have a significant impact on employee performance in this context. These findings suggest that while continuous learning and skill enhancement are crucial for maintaining high performance levels, the strategies to foster innovation may require re-evaluation to be effective.

This research contributes to the existing literature by integrating the effects of training, development, and innovative work behavior on employee performance, an area that has been relatively underexplored. The results validate existing theories that emphasize the importance of training and development in boosting employee productivity and performance, as noted by Kharim and Choudhury (2019) and Abbas (2014). However, the study challenges previous findings by Shanker and Bhanugopan (2017) regarding the positive impact of innovative work behavior, suggesting that its effectiveness may be contingent on contextual factors. Additionally, this study provides valuable insights specific to the heavy equipment industry, underscoring the necessity of sector-specific research to understand the dynamics of employee performance.

Future research should delve deeper into the contextual factors that might influence the relationship between innovative work behavior and employee performance. Factors such as organizational culture, management support, and industry-specific challenges could play a significant role in determining the effectiveness of innovation initiatives. Longitudinal studies would also be beneficial to examine the long-term impacts of training, development, and innovative work behavior on employee performance, providing a more comprehensive understanding of these relationships over time.

Comparative studies across different industries could identify sector-specific differences and help generalize the findings. Employing qualitative research methods would offer deeper insights into how employees perceive and experience training, development, and innovation programs. Expanding the scope of research to include additional variables such as leadership styles, employee engagement, and organizational support could provide a more holistic view of the factors influencing employee performance.

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