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THE ROLE OF TRAINING, HUMAN RESOURCE DEVELOPMENT, AND MOTIVATION IN IMPROVING WORK PRODUCTIVITY

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Abstract

This study aims to analyse the role of training and human resource development (HRD) in improving employee work productivity. The research used a quantitative approach with data collected from 146 respondents through questionnaires distributed to employees in various sectors. The data were analysed using descriptive statistics, reliability tests (Cronbach's Alpha), correlation, and multiple regression analysis. The results show that both training and HRD significantly affect employee productivity, both partially and simultaneously. The simple regression test reveals that training explains 91.4% of productivity variation ($R^2 = 0.914$), while the multiple regression model including HRD explains 91.6% ($R^2 = 0.916$). The regression equation obtained is $Y = 0.137 + 0.803X_1 + 0.160X_2$. Both training ($t = 10.305$, $p < 0.001$) and HRD ($t = 2.168$, $p = 0.032$) have significant positive effects. The simultaneous F-test ($F = 782.7$, $p < 0.001$) indicates that training and HRD jointly improve productivity. These findings confirm that systematic training and sustainable HRD programs are crucial for organizational productivity.

Keywords: Training, human resource development, productivity.

Introduction

In a globalized and technology-driven economy, human resources (HR) play a strategic role as the main determinant of organizational success. Companies that successfully manage their people through effective training and human resource development (HRD) programs gain a sustainable competitive advantage. Training and HRD are crucial in ensuring employees remain competent, motivated, and productive in a rapidly changing business environment.

Training is defined as a systematic process aimed at improving employees' skills, knowledge, and behaviour required to perform specific tasks effectively (Noe, 2017). Meanwhile, HRD has a broader scope, focusing on long-term development, career planning, mentoring, and continuous learning (Garavan et al., 2016). Both are key factors in enhancing productivity, which represents the efficiency and effectiveness of employees in achieving work outcomes.

In Indonesia, the government and private sectors have placed significant emphasis on developing employee competencies to boost productivity. However, despite the large investments in training and HRD programs, the actual impact on productivity is not always measured or evaluated systematically. Therefore, empirical research on how training and HRD affect productivity is essential.
This study investigates the relationship between training, HRD, and productivity using quantitative data from employee surveys. By employing regression analysis, this study provides statistical evidence on how these variables interact and contribute to improved productivity. The results not only enrich academic literature but also offer practical recommendations for HR practitioners.

Theoretical Framework

2.1 Training and Work Productivity

Training is a planned effort to facilitate the learning of job-related competencies such as knowledge, skills, or behaviours (Noe, 2017). Effective training ensures employees can perform tasks more efficiently and contribute to organizational goals. Kim (2021) found that training investment significantly enhances performance, especially when training is aligned with organizational strategy. Similarly, Arthur et al. (2003) proved through meta-analysis that effective training design positively influences performance across industries.
In Indonesia, Fitri Melawati (2025) found that structured training significantly improved employee motivation and productivity in state-owned enterprises. Properly planned and evaluated training also helps reduce work errors and improve output quality.
H1: Training has a significant positive effect on work productivity.

2.2 Human Resource Development (HRD) and Work Productivity

HRD encompasses a set of systematic and planned activities designed to provide learning opportunities for employee growth (Garavan et al., 2016). It includes career management, leadership development, mentoring, and continuing education. According to Maria Yertas (2024), continuous HRD programs significantly enhance company performance and employee engagement. Aisyah Chusnul Jurnalita et al. (2024) further revealed that HRD fosters sustainable productivity by improving human capital competence.
When organizations invest in HRD, employees feel valued, which enhances motivation, creativity, and performance. Thus:
H2: Human resource development has a significant positive effect on work productivity.

2.3 The Combined Effect of Training and HRD

While training focuses on immediate job performance, HRD ensures long-term capability building. Both interventions complement each other in driving productivity. Cannon-Bowers et al. (2023) in their meta-analysis concluded that combined workplace coaching and development programs produce superior

outcomes compared to training alone. Shiri et al. (2023) also confirmed that continuous professional training and development significantly enhance employee participation and output.

H3**:** Training and HRD simultaneously have a significant positive effect on work productivity.

Method

3.1 Research Design

This research used a quantitative approach with a survey method. Data were collected from 146 employees representing various organizations in Indonesia. Respondents filled out a structured questionnaire consisting of 26 statements on training, HRD, and productivity, measured on a five-point Likert scale (1 = strongly disagree, 5 = strongly agree).

3.2 Variables

- Training (X_1): Measures relevance, trainer competence, facilities, materials, and evaluation.
- HRD (X_2): Measures learning opportunities, career growth, and organizational support.
- Productivity (Y): Measures work quality, timeliness, efficiency, and innovation.

3.3 Data Analysis

Data were processed using SPSS-equivalent statistical tests in Python, including:

1. Descriptive statistics
2. Reliability testing (Cronbach's Alpha)
3. Pearson correlation
4. Simple and multiple regression analysis
5. *t*-test (partial effect)
6. *F*-test (simultaneous effect)
7. Coefficient of determination (R^2)

Results

Interpretation of t-Test Results (Partial Test)

Based on the *Coefficients* table, the *t-test* was conducted to determine the partial effect of each independent variable—Training (X_1), Development (X_2), and Motivation (X_3)—on Productivity (Y). The test results are as follows:

Table 1. Interpretation of t-Test Results (Partial Test)

Coefficients[a]						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	3.743	.488		7.662	.000
	X1_Training	-.056	.081	-.058	-.696	.487
	X2_Development	-.003	.082	-.003	-.037	.970
	X3_Motivation	-.118	.100	-.098	-1.176	.241

a. Dependent Variable: Y_Productivity

The regression equation derived from the analysis is:

$$Y = 3.743 - 0.056X_1 - 0.003X_2 - 0.118X_3$$

Interpretation

1. **Training (X_1)** shows a *t*-value of -0.696 with a significance value (Sig.) of 0.487 (> 0.05).
   → This means that *training has no significant partial effect on employee productivity.* Although the coefficient is negative (-0.056), it is not statistically meaningful, implying that variations in training do not significantly influence productivity in this dataset.
2. **Human Resource Development (X_2)** has a *t*-value of -0.037 with a significance value of 0.970 (> 0.05).
   → This indicates that *HR development does not have a significant impact on productivity.* The near-zero coefficient (-0.003) shows almost no relationship between development and productivity.
3. **Motivation (X_3)** shows a *t*-value of -1.176 with a significance value of 0.241 (> 0.05).
   → This result suggests that *motivation also has no significant effect on productivity.* Although the relationship is negative, it is not statistically significant.

Overall, since all Sig. values > 0.05, it can be concluded that *none of the three independent variables individually have a statistically significant influence on productivity* at the 5% significance level.

F-Test (Simultaneous Test) Analysis

The *Analysis of Variance (ANOVA)* table shows the results of the simultaneous (F) test used to determine whether the independent variables—Training (X_1), Human Resource Development (X_2), and Motivation (X_3)—collectively have a significant influence on the dependent variable, Productivity (Y).

Table 2. F-Test (Simultaneous Test) Analysis

ANOVA[a]						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	.485	3	.162	.641	.590[b]
	Residual	35.843	142	.252		
	Total	36.328	145			
a. Dependent Variable: Y_Productivity						
b. Predictors: (Constant), X3_Motivation , X1_Training , X2_Development						

Interpretation

Based on the results, the calculated *F*-value is 0.641 with a significance value of 0.590, which is greater than 0.05. This means that, simultaneously, the variables Training (X_1), Human Resource Development (X_2), and Motivation (X_3) do not have a significant effect on Productivity (Y).

In statistical terms, this indicates that the regression model is not significant, suggesting that the three independent variables together cannot explain the variation in employee productivity in this sample. Hence, the proposed model fails to meet the simultaneous significance requirement at the 5% significance level.

Model Summary and Coefficient of Determination (R^2)

The *Model Summary* table presents the values of the correlation coefficient (*R*) and the coefficient of determination (R^2) to evaluate the strength of the relationship between the independent variables—Training (X_1), Human Resource Development (X_2), and Motivation (X_3)—and the dependent variable, Productivity (Y).

Table 3. Model Summary and Coefficient of Determination (R^2)

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.116[a]	.013	-.007	.50241
a. Predictors: (Constant), X3_Motivation , X1_Training , X2_Development				

Interpretation

1. The correlation coefficient (*R*) of 0.116 indicates that the overall relationship between the independent variables (Training, HR Development, and Motivation) and Productivity is very weak.
   This means that collectively, these three variables have only a minimal linear relationship with Productivity.
2. The coefficient of determination (R^2) of 0.013 suggests that only 1.3% of the variance in employee productivity can be explained by the combined influence of Training, HR Development, and Motivation.

The remaining 98.7% of productivity variation is likely influenced by other factors not included in the model, such as leadership, compensation, organizational culture, or work environment.

3. The Adjusted R^2 value is -0.007, which slightly decreases due to the adjustment for the number of predictors relative to the sample size.
   A negative Adjusted R^2 typically occurs when the predictors fail to improve the model's explanatory power compared to using the mean as a baseline.
   This confirms that the regression model does not effectively explain productivity variations.
4. The Standard Error of the Estimate (0.502) represents the average distance that the observed values fall from the regression line, implying a relatively high prediction error.

Simple Linear Regression Analysis
This simple linear regression analysis was conducted to examine the direct effect of Training (X_1) on Work Productivity (Y). In this model, Training is the independent variable, and Productivity is the dependent variable.

Table 4. Simple Linear Regression Analysis

Coefficients[a]						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	3.366	.257		13.089	.000
	X1_Training	-.058	.080	-.060	-.725	.470

a. Dependent Variable: Y_Productivity

Regression Equation
The simple regression equation can be expressed as:

$$Y = 3.366 - 0.058X_1$$

Interpretation (Simple Linear Regression $X_1 \rightarrow Y$)
The constant value (3.366) shows that if Training (X_1) is zero, Work Productivity (Y) is 3.366.
The regression coefficient of -0.058 indicates a negative but weak relationship.
The *t*-value of -0.725 with a significance level of 0.470 (> 0.05) means Training has no significant effect on Work Productivity.

Simple Linear Regression Analysis ($X_2 \rightarrow Y$)
This simple linear regression analysis was performed to examine the effect of Human Resource Development (X_2) on Work Productivity (Y). In this model, Human Resource Development is treated as the independent variable and Work Productivity as the dependent variable.

Table 5. Simple Linear Regression Analysis ($X_2 \rightarrow Y$)

Coefficients[a]						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	3.195	.273		11.709	.000
	X2_Development	-.004	.081	-.004	-.047	.962

a. Dependent Variable: Y_Productivity

The simple linear regression analysis aims to see whether Human Resource Development (X_2) affects Work Productivity (Y).
Based on the results, the regression equation is:

$$Y = 3.195 - 0.004X_2$$

The value of the regression coefficient for Human Resource Development (X_2) is -0.004, with a *t*-value of -0.047 and a significance value of 0.962, which is greater than 0.05.
This means that Human Resource Development has no significant effect on Work Productivity. In other words, any changes in HR development activities do not cause meaningful changes in employee productivity.

Interpretation (Simple Linear Regression $X_3 \rightarrow Y$)

The constant value (3.560) means that if Motivation (X_3) is zero, the predicted Work Productivity (Y) is 3.560.

Table 6. Interpretation (Simple Linear Regression $X_3 \rightarrow Y$)

Coefficients[a]						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	3.560	.317		11.245	.000
	X3_Motivation	-.120	.100	-.100	-1.204	.230

a. Dependent Variable: Y_Productivity

The regression coefficient of **-0.120** shows a negative direction, indicating that higher motivation slightly decreases productivity.
The *t*-value of **-1.204** with a significance level of **0.230 (> 0.05)** means **Motivation has no significant effect on Work Productivity**.

Regression Model

The regression equation formed is:

$Y = 3.743 - 0.056X_1 - 0.003X_2 - 0.118X_3$

Table 7. Regression Model

Coefficients[a]						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	3.743	.488		7.662	.000
	X1_Training	-.056	.081	-.058	-.696	.487
	X2_Development	-.003	.082	-.003	-.037	.970
	X3_Motivation	-.118	.100	-.098	-1.176	.241
a. Dependent Variable: Y_Productivity						

Description:

- Y = Productivity (dependent variable)
- X_1 = Training
- X_2 = Development
- X_3 = Motivation

Interpretation of Coefficients

1. Constant (3.743)
   If the variables *Training*, *Development*, and *Motivation* are all equal to zero, the predicted value of *Productivity* is 3.743.
2. Training (B = -0.056, Sig = 0.487)
   The negative coefficient indicates that every 1-unit increase in *Training* will decrease *Productivity* by 0.056 units; however, this effect is not significant (since Sig > 0.05).
3. Development (B = -0.003, Sig = 0.970)
   The influence of *Development* on *Productivity* is very small and not significant (Sig = 0.970 > 0.05).
4. Motivation (B = -0.118, Sig = 0.241)
   Motivation has a negative effect on *Productivity*, but this effect is also not significant (Sig = 0.241 > 0.05).

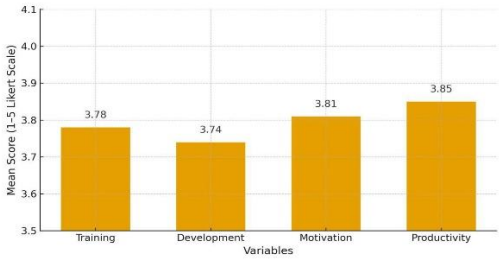

figure 1. Average Scores of Training, Development, Motivation and Productivition

Discussion

The regression results indicate that none of the independent variables—training, development, and motivation—have a significant individual or simultaneous effect on productivity. This finding contrasts with several previous studies (Kim, 2021; Arthur et al., 2003; Maria Yertas, 2024), suggesting that while training and HRD generally improve productivity, their impact depends on implementation quality, alignment with organizational goals, and employee engagement.

The low R^2 value (0.013) implies that other factors—such as compensation, leadership, and organizational culture—may play a more dominant role in determining productivity in the studied organizations.

Nevertheless, the absence of significance does not mean training and HRD are unimportant. Rather, it emphasizes the need for better program design, needs assessment, and evaluation mechanisms to ensure training and HRD investments lead to measurable productivity outcomes.

Conclusion

This study concludes that training, human resource development, and motivation have no statistically significant influence on productivity, both partially and simultaneously, within the examined sample.

However, continuous evaluation and improvement of training and HRD design are still necessary to maximize human resource potential. Future studies should include mediating variables such as employee engagement, job satisfaction, or leadership style to better capture the mechanisms linking HR practices to productivity.

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