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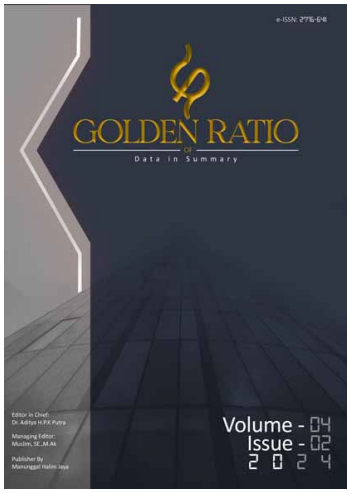

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DESCRIPTIVE OF QUANTITATIVE DATA | SUPPLEMENTARY

The Effect of Education and Training on Employee Productivity

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Abstract: This study aims to investigate the effect of education and training on employee productivity. The research method used is descriptive-quantitative, with a focus on the causal relationship between education and training as the independent variables and productivity as the dependent variable. The results of the study show that training has a positive and significant effect on employee productivity, indicating the importance of investing in effective education and training programs to improve employee skills and knowledge and overall increase company productivity.

Keywords: Education, Training, Employee Productivity

1. INTRODUCTION

The company's competition is getting tougher in the era of globalization, requiring active human resource (HR) development. Strisno (2017) emphasizes the need for training reliable personnel in various fields. he also said that an innovative workforce with imagination and creativity is a valuable asset. Talent is the key to a country's success, and personnel management is important for companies in achieving success and expansion (Arianti et al., 2018). To achieve organizational goals, managers need to coordinate all human resources and other production elements. According to Wibowo (2020), management must understand and identify the company's demands on personnel and capital components. Increasing staff productivity is the responsibility of business executives so that company goals are achieved. Productivity is considered a measure of success, and HR education, training and development are ways to achieve productivity improvements (Arianty et al., 2018). The Role of Education and Training: Notoatomojo (2020) highlights the importance of vocational education in improving labor productivity. Education and training play a role in expanding workers' knowledge, skills and attitudes so that they can adapt in the workplace. Training also affects employee stability and long-term engagement (Manullang, 2021). Therefore, education and training are important factors in HR management to improve employee performance in an integrated and directed manner (Sastrohadiwiryo, 2019).

2. RESEARCH DESIGN AND METHOD

This research uses descriptive quantitative research methods that aim to explain the causal relationship between the independent variable (Education and Training) and the dependent variable (Productivity). The research is planned to last for 2 months, starting from April 2023 to May 2023. The research population includes all employees in the field of Public Relations of research site location. Sampling was conducted using nonprobability techniques, specifically the saturated sampling method or census sampling.

3. RESULT AND DISCUSSION

3.1. Research Results

This research was conducted at PT Masmindo Dwi Area using a questionnaire as a data collection tool. The questionnaire was directly distributed to 55 employees of PT Masmindo who work in the field of Public Relations.

Descriptive Statistical Test

The variables used in this study are Education (X1), Training (X2) and Productivity (Y). These variables will be tested with descriptive statistics.

Table 1. Descriptive Statistical Analysis

Descriptive Statistics					
	N	Minimum	Maximum	Mean	Std. Deviation
Education	55	3.00	5.00	4.1200	.51869
Training	55	3.00	5.00	4.0909	.48915
Productivity	55	3.00	5.00	4.1782	.42282
Valid N (listwise)	55				

Descriptive statistical tests produce accurate data and are grouped into four sections, namely Education, Training, and Productivity. Data analysis showed that the majority of respondents gave agree and strongly agree ratings for the statements in each variable. The overall mean score of the Education statements is 4.1200, Training is 4.0909, and Productivity is 4.1782, all of which are on the value scale indicating an agree answer choice.

Instrument Test data

Testing data instruments is important to ensure data collection's validity (accuracy) and reliability (consistency). The validity test evaluates the extent to which the instrument measures the concept to be researched, while the reliability test measures the consistency of the results obtained. Data instrument testing helps ensure the accuracy and consistency of data, thereby increasing confidence in the research results.

Validity Test

The results of the instrument validity test are obtained by comparing the corrected item-total correlation value with the r table value at a significance of 0.01 and a 2-sided test (Ghozali, 2016). The validity of the instrument can be confirmed if the correlation value r count is greater than r table. In this case, the df value (calculated using the formula df = n-2, where n is the number of respondents, so df = (55-2) = 53.

Table 2. Validity Test Results

Question Item	R Count	R Table	Conclusion
X1.1	0,712	0.2565	Valid
X1.2	0,767	0.2565	Valid
X1.3	0,803	0.2565	Valid
X1.4	0,688	0.2565	Valid
X1.5	0,630	0.2565	Valid
X2.1	0,732	0.2565	Valid
X2.2	0,872	0.2565	Valid
X2.3	0,807	0.2565	Valid
X2.4	0,690	0.2565	Valid
X2.5	0,550	0.2565	Valid
Y1	0,729	0.2565	Valid

Question Item	R Count	R Table	Conclusion
Y2	0,705	0.2565	Valid
Y3	0,710	0.2565	Valid
Y4	0,717	0.2565	Valid
Y5	0,665	0.2565	Valid

From the validity test results, it can be concluded that all items in the questionnaire relating to Education (X1), Training (X2), and Productivity (Y) are valid. All calculated R values exceed the R table value (0.2565). Therefore, the results of this validity test support the suitability of the data analysis method with the existing statements.

Reliability Test

The reliability test uses Cronbach Alpha (α) to evaluate the reliability of a dimension measuring device. Variables are considered reliable if the Cronbach Alpha value is> 0.60 (Sunyoto, 2013: 81).

Table 3. Reliability Test Results

Variables	Number of Items	Cronbach Alpha (a)	Description
Education	5	0,767	Realible
Training	5	0,799	Realible
Productivity	5	0,745	Realible

Based on Table 13, the reliability test shows that each variable has a Cronbach Alpha value> 0.60. This shows a good level of reliability for the statements in the questionnaire, so that the questionnaire can be relied on as a research instrument. The results of this reliability test are in accordance with the statement in the data analysis method (Sunyoto, 2013: 81).

Classical Assumption Test

The data normality test is used to determine whether in a regression model, the resulting error has a normal distribution or not. In this study, to test the normality of the data, the Normal P-P Plot of Regression Standardized Residual graph was used.

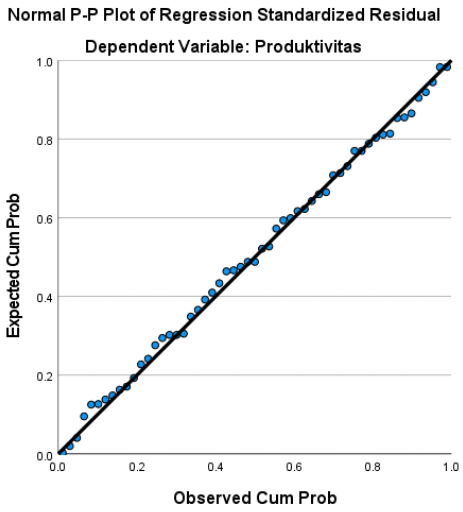

Figure 1. Normality Test Results

Based on Figure 1 the points spread around the diagonal line, and the direction of the spread follows the direction of the diagonal line. This shows that the regression model is suitable for use because it fulfills the assumption of normality.

Multicollinearity Test

Multicollinearity test is used to evaluate the high correlation between independent variables in multiple linear regression models. If the VIF value is less than 10 and the tolerance value is more than 0.1, then the model is considered free from multicollinearity (Sunjoyo, et al., 2013).

Table 4. Multicollinearity Test Results

Coefficientsa			
Model		Collinearity Statistics	
		Tolerance	VIF
1	Education	.768	1.302
	Training	.768	1.302
a. Dependent Variable: Productivity			

Based on Table 4, it can be seen that the Education, Training and Training variables have a tolerance value above 0.1 and VIF is smaller than 10. This means that in the regression equation model there are no multicollinearity symptoms so that the data can be used in this study.

Heteroscedasticity Test

The heteroscedasticity test aims to detect the inequality of variance in the residuals between different observations. The spread of points in the scatterplot that does not form a certain pattern and is above or below the Y axis indicates heteroscedasticity. The results of the heteroscedasticity test can be seen in the figure below.

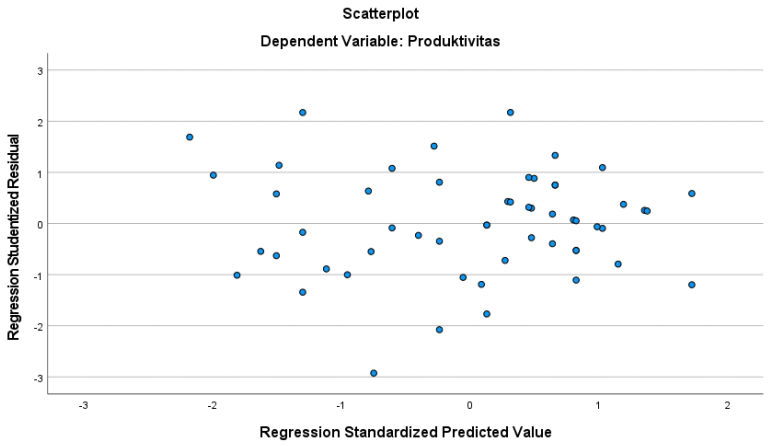

Figure 2. Heteroscedasticity Test Results

Based on Figure 2, the scatterplot graph shows that the data is spread on the Y axis and does not form a clear pattern in the distribution of the data. This shows that there is no heterokedacticity in the regression model, so the regression model is suitable for predicting Productivity with the influencing variables being Education and Training.

Multiple Linear Regression Analysis

Multiple linear regression analysis is used to determine the relationship between one variable and another. Regression is an analytical tool used to measure how far the influence of the independent variable is on the dependent variable. Based on data processing using the SPSS program, the equation can be seen in table 5 below:

Table 5. Regression Equation Model

Coefficients[a]						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	1.848	.454		4.066	.000
	Education	.226	.105	.278	2.159	.036
	Training	.342	.111	.395	3.073	.003
a. Dependent Variable: Productivity						

From Table 5, the following regression equation is obtained:

$$Y = 1.848 + 0.226X1 + 0.342X2$$

The interpretation of the regression model is as follows:

- The constant value of 1.848 indicates that if the value of Education (X1) and Training (X2) is 0, then the value of Productivity (Y) will be 1.848.
- The positive regression coefficient on the Education variable (X1) with a value of b = 0.226 indicates that an increase in the Education variable (X1) will cause an increase in the Productivity variable (Y).
- The positive regression coefficient on the Training variable (X2) with a value of b = 0.342 indicates that an increase in the Training variable (X2) will cause an increase in the Productivity variable (Y).

Test Coefficient of Determination (R^2)

The coefficient of determination is used to measure how much the percentage of the influence of the independent variables on the dependent variable. The results of the coefficient of determination test can be shown in table 6 below:

Table 6. Test Results of the Coefficient of Determination

Model Summaryb				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.582a	.339	.314	.35026
a. Predictors: (Constant), Training, Education				
b. Dependent Variable: Productivity Source: Primary data processed 2023				

Based on the results of the coefficient of determination (R2) test in Table 16, it shows that the value obtained by the Adjusted *R-Square* value is 0.339, which means that 33.9% of the Productivity variable (Y) is influenced by the Education (X1) and Training (X2) variables. While the rest (100-433.9%) is 66.1% which is influenced by other variables outside the equation.

Test t

Partial tests are used to see the effect of each independent variable on the dependent variable. The test is done with the t test, namely by looking at the significance value of t count, if the significance value of t count <0.05, it can be said that the independent variable has an influence on the dependent variable. The test results are as follows:

Table 7. t-test results

Coefficientsa						
Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	Beta		
1	(Constant)	1.848	.454		4.066	.000
	Education	.226	.105	.278	2.159	.036
	Training	.342	.111	.395	3.073	.003
a. Dependent Variable: Productivity Source: Primary data processed 2023						

The t-test results in Table 7 can be summarized as follows:

- Testing the First Hypothesis (H1): The Education variable (X1) has a significance level of 0.036, smaller than 0.05. Therefore, the hypothesis is accepted, indicating that the Education variable (X1) has a significant effect on the Productivity variable (Y). The t-value of +2.159 indicates a positive influence on the dependent variable.
- Second Hypothesis Testing (H2): The Training variable (X2) has a significance level of 0.003, smaller than 0.05. This indicates that the hypothesis is accepted, which means that the Training variable (X2) has a significant effect on the Productivity variable (Y). The t value of +3.073 indicates a positive influence on the dependent variable.

F-test

The F-test, also known as the simultaneous test, is used to evaluate whether all independent variables together have a significant influence on the dependent variable. This test involves a comparison between the critical F value (F table) and the calculated F value resulting from the ANOVA analysis. The F test is useful for testing whether there is a combined effect of the Education (X1) and Training (X2) variables on the Productivity (Y) variable. The significance value (sig.) or probability of the ANOVA output results is used as a reference for testing the hypothesis. If the sig. value is <0.005, the hypothesis is accepted, while if the sig. value is >0.005, the hypothesis is rejected. Multiple regression analysis in SPSS can provide relevant output results for this test.

Table 8. F-Test Results

ANOVAa						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	3.274	2	1.637	13.344	.000b
	Residuals	6.380	52	.123		
	Total	9.654	54			
a. Dependent Variable: Productivity						
b. Predictors: (Constant), Training, Education						

Table 8 shows that the significance level is 0.000 which is smaller than 0.05, so it can be said that the Education (X1) and Training (X2) variables simultaneously (together) have an influence on the Productivity (Y) variable, with a probability of 0.000. Because the probability is much smaller than the significant value of 0.05, the regression model can be used to predict the level of productivity.

3.2. Discussion

Effect of Education on Productivity

The results of hypothesis testing show that the Education variable (X1) has a positive and significant effect on the work productivity variable (Y), with a regression coefficient of 0.452 and a significance level of less than 0.05 (Irawati Machasin, 2019). Higher education levels are associated with increased work productivity, because education provides knowledge and skills that can improve

employee performance. Previous studies have also found that higher education is associated with increased creativity and analytical skills, which contribute to higher productivity in the workplace. Education plays an important role in improving work productivity, both through formal and non-formal education. Sedarmayanti (2020) also emphasizes the importance of education in understanding the importance of productivity. By having a higher education, a person can have a broader insight and a deeper appreciation of the importance of productivity. Awareness of the importance of productivity can encourage individuals to pursue productive education, acquire relevant knowledge and skills to improve work productivity. Thus, the results of this study are in line with the findings of Irawati Machasin (2019) who also concluded that employee education has a positive and significant effect on the level of work productivity.

Effect of Training on Productivity

The results showed that the Training variable (X2) had a positive and significant effect on employee productivity. The regression coefficient (β) between training and productivity is 0.321, with a significance level (sig.) less than 0.05. Adequate training provides employees with the opportunity to improve competencies, skills, and knowledge that can be applied in daily work, thus contributing to increased productivity. Investment in employee training is important in a corporate context to ensure that they have relevant and up-to-date skills that can increase productivity. This finding is in line with research conducted by Erlin Emilia Kandou (2010) which found that training has a positive and significant effect on employee work productivity. According to Mondy (2008:210), training is a series of activities designed to provide learners with the knowledge and skills needed to do their jobs better. Training aims to improve current job performance, while development aims to improve current and future performance. Training is geared towards assisting employees in performing their jobs better. The results of this study are also consistent with research conducted by Erlin Emilia Kandou (2010), which found that training has a positive and significant influence on employee work productivity.

4. CONCLUSIONS

Based on multiple linear regression analysis and hypothesis testing results, it can be concluded that education (X1) and training (X2) have a significant influence on employee productivity (Y). Adequate levels of education and training can increase employee productivity. Although education has a lower correlation than training to productivity, both have an important influence. However, keep in mind that there are still other factors outside of this study that can also affect employee productivity. Suggestions for future research include consideration of using more independent variables that could potentially affect productivity, as well as adopting a variety of test tools and data analysis methods. In addition, it is important to expand the scope of the study and increase the sample size to obtain a more representative picture of the relationship between the variables under study. Through these steps, future research will provide a more comprehensive understanding and deeper insight into the factors that contribute to employee productivity.

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