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RESEARCH ARTICLE

THE INFLUENCE OF TECHNOLOGY, WORK EXPERIENCE, EDUCATION AND TRAINING ON THE PERFORMANCE OF PRODUCTION WORKERS IN EAST JAVA

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ABSTRACT

The purpose of this study was to determine the effect of technology, work experience, education and training, both simultaneously and partially on the performance of production workers in East Java, and the most dominant variable affecting the performance of production workers in East Java. In this study, there are three independent variables consisting of technology, work experience, education and training, as well as the dependent variable is the performance of the production workers. The analysis performed in this study involved testing of research instruments, classical assumption test, multiple linear regression analysis, and hypothesis testing. Calculation of multiple linear regression analysis produces coefficient determination R2 = 0.320 that has a probability value of F calculated equal Sig. F = 0.000. Because $\rho \neq 0$ and the probability F test is smaller than the research test level (Sig. F $<\alpha$ ie 0.000 <0.05), then Ho is rejected and Ha accepted which means the simultaneous effect of variables of technology, work experience, and education and training on the performance of labor production in East Java is significant. Partially, two independent variables consisting of technology and work experience have a positive and significant impact on the performance of production workers in East Java, while education and training variables negatively affect the performance of production workers in East Java. The most influential variable is the dominant technology with variable t value for 6.517, greater than the t value of other variables.

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INTRODUCTION

Globalization is happening at this time, forcing the human resources to keep on updating, improve its capacity and skills in order not to fall behind by globalization. Human resources are a major figure in any activities of the organization, although there are other resources needed in society together /enterprise. Without the support of good human resources activities of the company will not run as planned even further would be out of business. Therefore, human resource is a part that is vital for the survival and success of an organization or enterprise. That requires human resources that are competent in their fields, experienced, and always wanted to improve its ability so that it can perform well and can increase work productivity. In conducting its business, enterprise must be supported by competent workers in the field, ranging from workers at the lowest level or labor in the production to the highest level in the company or top executives. The company must be responsive to the development of increasingly advanced technology, constantly should always update the technology applied in the company so that the effectiveness and efficiency of production can be achieved. Companies must update the skills of workers in order to keep abreast of the latest technology so that it can improve its performance.

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Hypothesis

The hypothesis in this study are:

1. There is the influence of technology, work experience, education and training simultaneously on the performance of production workers in East Java.
2. There is the influence of technology, work experience, education and training partially on the performance of production workers in East Java.
3. There is the influence of the most dominant variable on the performance of production workers in East Java.

MATERIALS AND METHODS

The variables in this study are:

Independent Variables

Technology (X1)

According Poerbahawadja Harahap, Technology is: (1) Studies that investigate ways of working in engineering; (2) The science used in factories and industries. Limits on indicators of technology in the production of labor are:

1. Skilled at operating machines
2. Expert in using machines
3. Newest machine to produce more
4. Use of equipment with ease
5. Modern equipment to produce more productive

Work experience (X2)

Measuring the person's work experience (Asri, 1986: 131), are:

1. Steady and smooth movements, each experienced employees will do steady movement in working without a doubt.
2. Rhythmic movements, meaning the creation of a habit of doing the job on a daily basis.
3. Faster response to signs, meaning signs such as workplace accidents that will happen.
4. Can predict difficulties that may come so they are more prepared to deal with it. By the work experience that they have, an experienced employee can be expected to predict difficulties and ready to deal with it.
5. Work with calm, an experienced employee will have the confidence that is quite large.

Limits on indicators of work experience are:

1. Steady and smooth in doing the job.
2. Flexible in doing daily tasks
3. Quick response
4. Can predict any difficulties
5. Have a great confidence

Education and Training (X3)

According to Soeprihanto (1987) with education and training means the expertness and skills of employees is increased, it is expected that the employee is able to achieve maximum performance in their respective sectors. With the maximum achievement then the employee's productivity is increased. Handoko (2000) states that the education and training (development) has a wider scope to improve and enhance the knowledge, skills, attitudes and personality traits.

Limits of the indicators on education and training of the production workers are:

1. Increased knowledge
2. Increasing the expertness and skills
3. Better attitudes
4. Improved performance
5. Increased motivation

Dependent variable is the performance of production workers (Y)

Performance is essentially what is done by the employees. The performance of the employees that are common to most jobs include several elements as follows (Mathis and Jackson, 2006, 378):

1. Quantity of results
2. Quality of results
3. Timeliness and results
4. Presence
5. The ability to cooperate

Population and Sample

The population in this study is the production workers in the province of East Java. In this study, samples were taken at four companies in East Java are located in four cities/ districts namely, PT Interbat located in Sidoarjo, PT HM Sampoerna in Surabaya, PT Garuda Food, located in Gresik and PT Sung Hyun located in Pasuruan. Because the population is very large and not known for certain, the author define the sample size of 158 people

Technical Analysis

In analyzing and testing hypotheses with respect to the issues in this study, the authors used multiple regression statistical analysis tool with the help of a computer program Statistical Product and Service Solutions (SPSS) 20 for windows, with the formula:

Multiple regression: $Y = a + b1X1 + b2X2 + b3X3 + e$

Where:

Y = Performance of production workers
X1 = Technology
X2 = Work Experience
X3 = Education and Training
a = a constant value
b1, b2, b3 = Coefficient Regression
e = error estimation

RESULTS

Regression Analysis Model

The results of multiple regression analysis in this study to test the effect of technology, work experience, education and training on the performance of production workers are presented in the following table:

Table 1. Multiple Linear Regression Model Summary X1, X2, and X3 to Y

Model Summary[b]				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	,566[a]	,320	,307	,44192

a. Predictors: (Constant), X3, X1, X2
b. Dependent Variable: Y
Source: results of the analysis

Table 2. Anova Regression X1, X2, and X3 to Y

ANOVA[a]						
Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	14,153	3	4,718	24,157	,000[b]
	Residual	30,076	154	,195		
	Total	44,229	157			

a. Dependent Variable: Y
b. Predictors: (Constant), X3, X1, X2
Source: results of the analysis

Coefficient determination R2=0.320, has a probability value of F calculated by sig. F=0.000. That means 32% of the variation of performance of production workers affected jointly by the technology, work experience, education and training,while the remaining 68% is influenced by other variables not examined.

Table 3. Coefficient regression of X1, X2, andX3, Against Y

Coefficients[a]						
Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	Beta		
1	(Constan)	2,758	,267		10,318	,000
	X1	,363	,056	,506	6,517	,000
	X2	,215	,086	,245	2,501	,013
	X3	-,265	,082	-,295	-3,248	,001

a. Dependent Variable: Y
Source: results of the analysis

From the table calculation results of multiple linear regression analysis above can be formed regression model and its significance as follows:

Y = 2.758 + 0.363X1 + 0.215X2 + -0.265X3 + e

Multiple linear regression models can be interpreted as follows:

constants of a = 2.758 is significant, because the calculated probability value is lower than the research test level (Sig. t <α or 0.000<0.05). This implies that if the technology, work experience, education and training does not exist or is zero then the performance of production workers will be positive for 2.758

If the technology (X1) increases by one unit, then the performance of production workers (Y) will increase by 0.363 units assuming other variables constant.

If the work experience (X2) increses by one unit, then the performance of production workers (Y) will increase by 0.215 units assuming other variables constant.

If education and training (X3) increases by one unit, then the performance of production workers (Y) will decrease by 0.265 units assuming other variables constant.

Hypothesis Testing Results

First Hypothesis Testing

Coefficient determination R2=0.320 has a probability value of F calculated by Sig. F=0.000. because ρ ≠0 and the probability F calculated is smaller than the research test level (Sig. F <α ie 0.000<0.05), then Ho is rejected and Ha accepted which means the simultaneous effect of variables technology, work experience, education and training on the performance of production workers is significant.

Second Hypothesis Testing

Technology variable (X1)

Regression coefficient of b1=0.363X1 has a probability value of significant t=0.000. Because b1≠0 and the probability is smaller than the research test level (Sig. t <α or 0.000<0.05), then Ho rejected and Ha accepted which means that the effect of partially technology (X1) on the performance of production workers (Y) significant.

Work Experience variable (X2)

Regression coefficient of b2=0.215X2 has a probability value of significant t=0.013. because b2≠0 and the probability is smaller than the research test level (Sig. t <α or 0.013<0.05), then Ho rejected and Ha accepted which means the partial effect of work experience variables(X2) on the performance of production workers (Y) significant.

Education and Training variable (X3)

Regression coefficient of b3 =-0.265X3 has a probability value of significant t=0.001. because b3≠0 and the probability is smaller than the research test level (Sig. t <α or 0.001<0.05), then Ho rejected and Ha accepted which means partial effect education and training variable (X3) on the performance of production workers (Y) significant.

Third Hypothesis Testing

Table 4. Summary of t test

Independent variables	t Value	Specification
Technology (X1)	6.517	Dominant
Work Experience (X2)	2.501	
Education and Training (X3)	-3.248	

Source: results of the analysis

DISCUSSION

Results of the study found that, together technology, work experience, and education and training can affect the performance of production workers in East Java. This is justified because Sig. F is smaller than the research test level. In partial, technology and work experience positive and significant impact on the performance of production workers in East Java. This is justified by the Sig. t smaller than the research test level. While education and training variables are negative and significant effect on the performance of production workers in East Java. Samples taken from four companies operating in four districts / cities in East Java, PT Interbat in Sidoarjo, PT HM Sampoerna in Surabaya, PT Garuda Food in Gresik, Indonesia and PT Sung Hyun in Pasuruan. The technology used by the company will determine the techniques and knowledge used by production workers,

which include: skilled to operate the machine, experts use the machine, the latest engine will produce more, the use of machinery or equipment with ease, generate more productive modern equipment. Someone who has a high work experience will provide a high output compared to a person who does not have work experience, it is because: a steady and smooth movement, each experienced employees will perform steady movement in working without a doubt. His movements were rhythmic, meaning the creation of the habit of doing the job on a daily basis. Faster response to signs, it means signs like accidents that would happen. Can be assumed to be the onset of difficulty so it is more prepared to face it, as supported by work experience has then an experienced employee canpredict their difficulties and are ready to face it. Work quietly; an experienced employee will have the confidence that is large enough. It is not uncommon companies often require work experience as a requirement in hiring in the company; it is helpful to boost performance.

Through education and training, there will be an increase include: increased knowledge, expertness and skills improvement, better attitudes, improved achievement, increased motivation. This research resulted in the coefficient of education and training amounted to -0.265, the negative effects show that the higher education and training held then the performance going down. This can be explained as follows by having higher education and training; a person will be challenged to work on parts that have a high challenge, with high expertise and skills that a person motivated to improve his performance, so it will feel bored quickly when placed in parts of the repetitive work and static as the lowermost part of the production, it is of course an effect on performance. In the education and training of sufficient will provide a significant improvement for production workers.

Conclusion

Based on the research that has been done, it can be concluded as follows:

1. Calculation of generating multiple linear regression analysis calculated F value of 24.157, with a value significantly smaller than the research test level (Sig. F <α ie 0.000 <0.05), then Ho is rejected and Ha accepted which means the simultaneous effect of technological variables, work experience, and education and training on the performance of production workers in East Java is significant for 0.000.

2. That the partial all independent variables, namely technology, work experience, and education and training have an effect on the dependent variable (performance production workers).

In the technology variables, obtained by coefficient regression b1 = 0.363 t probability value of significant t = 0.000. because b1 ≠ 0 and the probability of t is smaller than the research test level (Sig. t <α or 0.000 <0.05), then Ho is rejected and Ha accepted which means that the partial effect of technology on the performance variables is significant. The significance of the test results proves the influence of technology on the performance of production workers is positive. The positive influence shows that the higher the technology used by the company, the higher the performance of production workers. The variable work experience, obtained by regression coefficient b2 = 0.215 has the value of a significant probability of t = 0.013. because b2 ≠ 0 and the probability t is smaller than the research test level (Sig. t <α or 0.013 <0.05), then Ho is rejected and Ha accepted which means that the partial effect on the performance of work experience is significant. The significance of the test results proves the partial effect of variables on the performance of work experience of workers who are positive. The positive influence shows that the higher the work experiences of the workers, the higher the performance. In the education and training variables, coefficient regression obtained by b3 = -0.265 has a probability of value of t count equal to significantly t = 0.001. because b3 ≠ 0 and the probability t is smaller than the research test level (Sig. t <α or 0.001 <0.05), then Ho is rejected and Ha accepted which means that the partial effect on the performance of education and training of production workers significantly. Significance testing results shows that the variable partially influences on the performance of education and training of workers is negative. The negative effect shows that the higher education and training held, the lower the performance.

3. The most dominant variable influence is variable technology (X1) with t value greater than t of other independent variables.

Recommendations

Based on these results, the recommendations given is as follows:

1. Of the three variables: technology, work experience, and education and training, together have a significant influence on the performance of production workers, the company can continue to update its technology in order to increase performance, look for experienced workers, provide education and enough training. With the increasing performance of production workers, then the company's performance will also increase.
2. The negative effect on the education and training variables showed that the higher education and training held the lower of the performance. The company should really pay attention in this case, because of the high education and training acquired knowledge and skills is also high, with the provision of high skill and knowledge worker does not show the maximum performance when employed in the air that is done repeatedly and static. But with sufficient education and training will be able to improve its performance.
3. The company must always improve the technology used in order to win the competition and to reduce the cost per unit, so that the performance of the company can continue to increase.

For further research is intended to examine the same topic, it is recommended to further increase the specific variables related to the performance of production workers.

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