THE INFLUENCE OF TEACHING FACTORY LEARNING MODEL IMPLEMENTATION TO THE STUDENTS' OCCUPATIONAL READINESS

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ABSTRACT

This study examines the significance level of teaching factory learning model to the occupational readiness of the students. Using the research design of a quantitative approach with causal comparative, the study included the following variables: teaching factory learning model (X) and occupational readiness (Y).The population consisted of 30 students of the study program of Automotive Engineering Education, Faculty of Engineering, State University of Semarang. They were selected using proportional random sampling technique. The data was analysed using descriptive and inferential statistical analysis. The findings shows the implemetation of teaching factory learning models (X) contributes significantly with the percentage of 22.80% to the occupational-readiness (Y). These results suggest that the implementation of teaching factory in the learning process is strongly recommended for the vocational educators both lecturers and teachers. The implementation can be adjusted to suit the conditions and the learning resources available in the educational institution.

Keywords: occupational readiness, learning model, teaching factory

INTRODUCTION

Higher education is important investment of every individu to learn and build their competency to prepare and compete within the framework of the world of work. The learning process in higher education is continuously improved in the terms of learning programs, models, methods and teaching techniques. This continuing improvement aims to better prepare the graduates to function efficiently and adjust readily within the needs of business and industry contexts.

Theoretically, the employment rate of college graduates should be higher than the groups with lower level of educational attainment because the job opportunities is supposed to be decreased in accordance with the number of graduates with higher education levels (Keyfitz, in Suyanto 2014).

On the contrary, Suyanto (2014) finds that today the largest proportion of the unemployment rates is nominated to groups with higher education levels. The educational institution is currently facing serious criticism for not being able to produce well-prepared graduates. There is a discrepancy (mismatch) between the output of the education and the demands of economic development. The quality of graduates unsuccessfully satisfy the market needs.

The unexpected facts reveal that higher education causes the youth refuse to do manual works, including jobs in the agricultural sector, which is considered less appropriate to the level of education they have. Educated people, especially college graduates tend to prefer jobs in the services sector, while the growth of employment in the services sector was not able to keep pace with the growth of educated labor force.

Wirakusuma (2013) states that according to the data in February 2013 released by the Central Statistics Agency, of 7.17 million unemployed people in Indonesia, colleges' graduates account for 5.04% of the total unemployment or 360.000 people. Furthermore, Kompass (2014) states that more than 600.000 colleges graduates are still unemployed. The educated unemployment consists of graduates with bachelor degree in a large scale. It includes 420.000 bachelor graduates, and the rest are diploma graduates. It is an alarming report because it indicates that there is a certain mismatch between the qualifications of educational institution graduates and the labor market needs (Suyanto, 2014).

These facts reveals that the educational institution do not effectively function to generate optimum occupational readiness of the students in the direction of stable agreement between the qualifications of the graduates with the requirements of labor market needs. There is urgent need for improving and adjusting the teaching learning process in the educational institution to cope with the requirements of fast developing market needs.

One of the potential solutions is by implementing teaching factory learning model. This concept is an inovation in Indonesian vocational education. Vocational education in Indonesia is placed as the particular educational institution that has set the main goal of producing qualified human resources equipped with affective, cognitive and psychomotor competencies who are supposed to be completely ready to enter the workforce after accomplishing the learning process. (Siswandi and Sukoco, 2016). Therefore, it should connect between the skills and competencies built during the learning process and the requirements of labor market needs.

Fajaryati (2012) added that teaching factory learning model combines competency-based approach and production based learning. The process of expertise or skills is designed and implemented based on real standard and procedures to achieve products that comply with the demands of the market or consumers. The resulted product can be either goods or services. This study aims to examine the significance level of teaching factory learning model to the occupational readiness of the students.

METHOD

The study was designed using quantitative approach with causal comparative. The variables consisted of teaching factory learning model (X) and occupational-readiness (Y). Figure 1 presents the research design in this study.

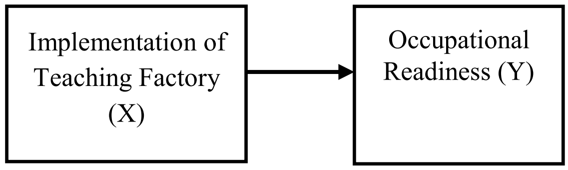


Figure 1. Research Design

The population of the study consisted of 90 students of Automotive Engineering Education, Faculty of Engineering, Semarang State University in the fourth semester of 2012 academic year. It was carried out in the subject of Motorcycle Practices and Small Motor. This study involved 30 samples selected using proportional random sampling technique. The data was elicited by way of questionnaires and a test. The questionnaires were administered to measure the variable of teaching factory while the test examines the occupational-readiness.

The obtained data was analysed using descriptive and inferential statistical analysis. The descriptive statistical analysis analyse the data resulted from the questionnaires and it is presented in the form of percentages. While the inferential statistical analysis focus on the hypothesis testing to prove the significant contribution of teaching factory to the occupational-readiness through correlation and linear regression analysis.

The data was processed with the significance level of 0.05 (5%). It was firstly tested for normality and linearity to meet two basic assumptions that the data has normal and linear distribution, and has the same pair in line with the same subject.

RESULTS AND DISCUSSION

The research data consisted of two variables: teaching factory model as the independent variable (X) and the occupational-readiness as the dependent variable (Y). The presented description of the data includes minimum score, maximum score, mean, median, mode, standard deviation, variance, and the range aiming at describing and determining the correlation between the two variables. The instrument of the teaching factory consisted of 35 points. It was validated by two experts or specialists in advance. The research data was then processed using SPSS 20. The teaching factory variable has the minimum score of 70 and achieves the maximum score of 90. The mean, the median, and the mode scores are 78.63, 77.50, 75 respectively. While the scores of standard deviation, variant and range are 6.414, 41.137, and 20 respectively. The detailed data is presented in Figure 2.

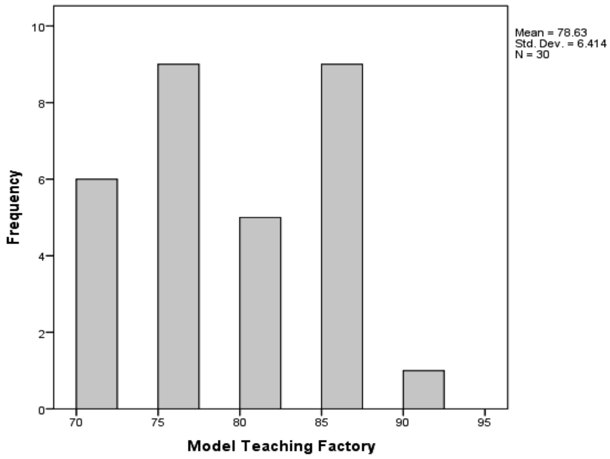


Figure 2. Teaching Factory Model

The instrument of occupational readiness includes 36 points and they were all validated by two experts / specialists. The processed data shows the minimum and the maximum scores were 75 and 88 respectively. The mean, the median, and the mode scores are 80.70, 81, and 82 respectively. While the standard deviation, the variance, and the range were 2.867, 8.217, 13 respectively. Figure 3 shows the occupational readiness of the students.

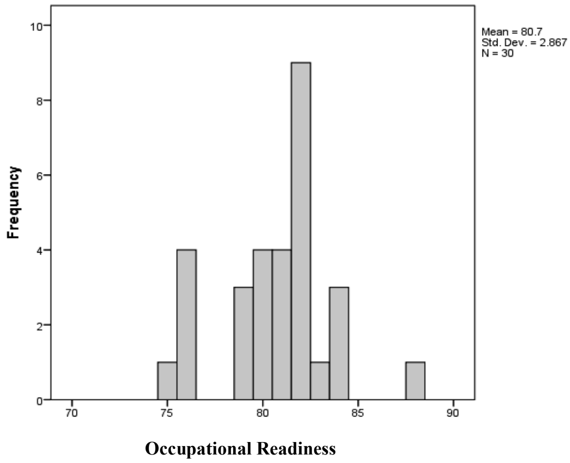


Figure 3. Occupational Readiness

The normality test is carried out with a kolmogrov smirnov. The distribution of variables is clasified into a normal curve if the probability is higher than 0.05, and vice versa. The normality test results is presented in Table 1.

Table 1. Normality Test

Variabel	$r_{arithmetic}$	Result	Decision
Model Teaching Factory	0.127	> 0.05	Normal
Occupational Readiness	0.439	> 0.05	Normal

Table 1 describes the significant values of the teaching factory and occupational readiness are 0.127 and 0.439 respectively. It can be concluded that each variable has normal distribution. The linearity test with SPSS 20 for windows is conducted using linear regression analysis. The criteria used in the linearity test is, if the probability value is less than 0.05, it is linier. The summary of linearity analysis is shown in Table 2.

Table 2. The Linearity Analysis

Variabel	Sig	Result	Decision
Teaching Factory to occupational readiness	0.001	< 0.05	Linier

Table 2 explains the significant value of the teaching factory to the occupational readiness is 0.001. It shows that the data of each variable is linear and there is not collinearity problem. The hypothesis testing is conducted using correlation and linear regression analysis with SPSS 20 for windows with a significance level of 0.05 (5%). The correlation analysis is presented in Table 3.

Table 3. The Correlation Analysis

		Teaching Factory Model	Occupational Readiness
Factory Teaching Model	Pearson Correlation	1	.478**
	Sig. (2-tailed)		.008
	N	30	30
Occupational Readiness	Pearson Correlation	.478**	1
	Sig. (2-tailed)	.008	
	N	30	30

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

The criteria of the correlation testing is if the probability is less than 0.05, it indicates there is a significant correlation and vice versa. The analysis shows the value of sig. is 0.008, it means the value of sig.0.008 < 0.05. It can be concluded that there is a significant correlation between the variables with the value of 0.008. The data is then further analysed by linear regression analysis.

The results of linear regression analysis shows the R value is 0.478 and the determination coefficient (R square) is 0.228. This suggests occupational readiness (Y) is influenced 22.80% by the teaching factory (X) while the rest (100% -22.80% = 78.20%) is influenced by other factors. The calculation is presented in Table 4.

Table 4. Linear Regression Analysis

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.478[a]	.228	.201	2.563	.228	8.279	1	28	.008

The Anova test shows that the value of F is 8.279 with a probability level sig. of 0.008 The probability level of 0.008 is lower than 0.05, then the regression model can be used to predict the contribution of the teaching factory model to the occupational readiness. The anova calculation results are presented in Table 5.

Table 5. Anova Calculation Results

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	54.379	1	54.379	8.279	.008[b]
	Residual	183.921	28	6.569		
	Total	238.300	29			

The decision criterion for hypotheses testing based on t test is if the value of t observed ≥ the t table, then H0 is rejected and Ha is accepted, it reveals the correlation is significant. If t observed ≤ t table, then H0 is rejected and Ha is accepted, it means the correlation is insignificant. DOF or degrees of freedom is used for N-2 or 30-2 = 28, so the t table = 2.048. Then based on the table Coefficients, t observed is 2.877 Thus, the value of t observed > t table, or 2.048> 2.877, it can be concluded that there is a significant contribution of the teaching factory model to the occupational-readiness. The analysis of the table coefficients is presented in Table 6.

Table 6. The Table of Coefficients Analysis

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	63.912	5.854		10.918	.000
	Model Teaching Factory	.214	.074	.478	2.877	.008

The decision criterion for hypothesis testing is if the probability value of 0.05 is less than or equal to the probability Sig or (0,05 ≤ Sig), then H0 is accepted and Ha is rejected, it means insignificant. If the probability value of 0.05 is higher than or equal to the probability Sig or (0,05≥Sig), then H0 is rejected and Ha is accepted, it means significant. Table 6 shows the variables of the teaching factory model and occupational readiness have the value of sig. 0.008, and it is then compared with the probability of 0.05, 0.05 > 0.008. Thus it can be concluded that H0 is rejected and Ha is received. It means that there is a significant contribution. The result of the normal probability plot analysis as shown in Figure 4, indicates that the deployment of existing data on the variables of teaching factory model and occupational readiness illustrates the linear regression line, because the points located near or around the straight line.

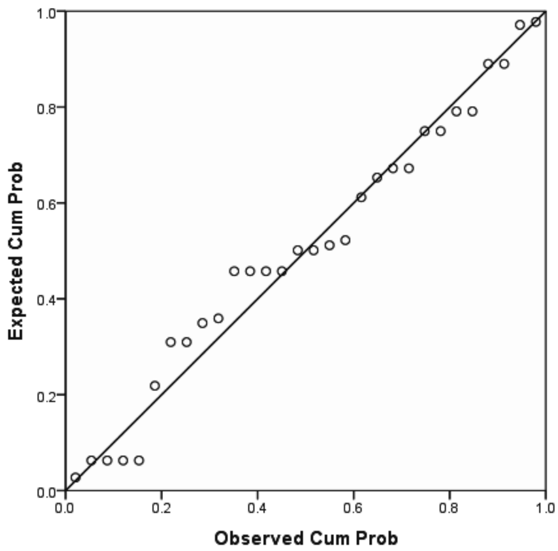
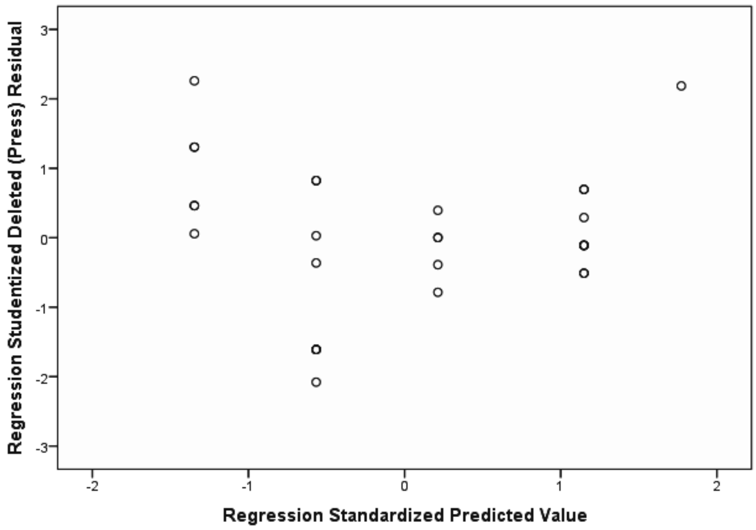


Figure 4. Normal Probability-Plot

The results of the scatter-plot analysis as shown in Figure 5 explains the distribution of the data of the variabel of teaching factory model to occupational readiness. This helps to predict the value of linear regression of the variables. Based on the figure, it can be identify that the points do not form a clear pattern, and the points spread above and below the number of 0 on the Y axis, thus it can be accepted that there is not a problem of heteroscedasticity in the regression model.



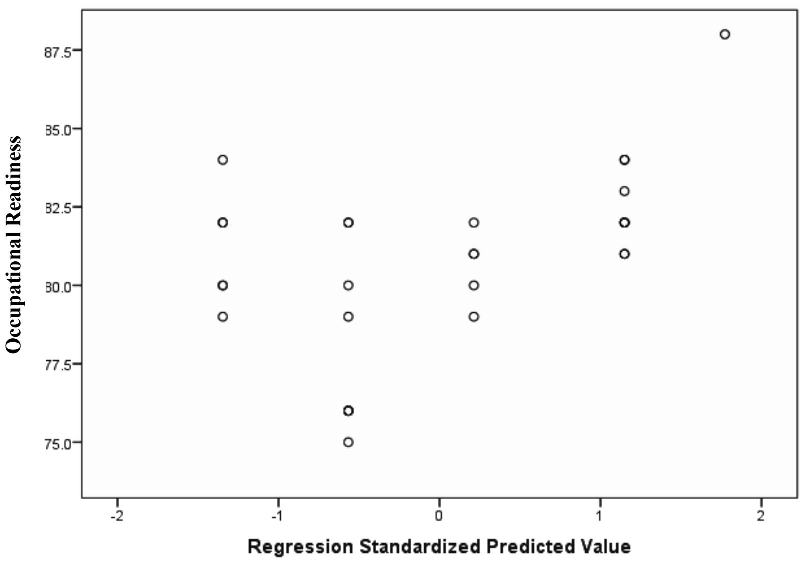


Figure 5. Scatterplot of Dependent Variable: Occupational Readiness

The calculation of the determination coefficient (R-Square) in Table 4 above is 0.228. It indicates the variabel of occupational-readiness (Y) is 22.80% influenced by the variable of teaching factory learning model (X). It also suggests that the teaching factory learning model contributes significantly to the students' vocational competence for the world of work, especially in industries.

The results of this study are relevant to the study conducted by Matt, et.al (2014) concerning the concept of learning factory, established and inaugurated in 2012, through a small factory laboratory at the Faculty of Science and Technology, University of Bolzano. The results show that the success in the learning process has an intense relation with both learning theories and practices.

The significant contribution of teaching factory learning model to the occupational readiness of the students suggests the vocational educators both lecturers in and teachers to apply the model of teaching factory in the learning process. The implementation can be adjusted to suit the learning conditions and the existing learning resources. The graduates of vocational education have increasing challenges in dealing with the world of work. It is caused by the dynamic and complex development of the technology. In addition, Wagner et al (2014) states that the engineers and practitioners of modern industry are faced with the dynamic challenges in global markets.

Dealing with these challenges, one of solution is the development and improvisation of teaching factory model implemented in vocational education programs. The implementation of teaching factory model in educational settings will connect the learning environment and the reality in the workplaces. Harja (2013), explains based on a study carried out in Class XII of Electrical Installation Program in SMK N 2 Yogyakarta, there is positive and significant correlation between job competencies and motivation toward occupational readiness with the correlation value of 0.721 at a significance level of 5% and with a contribution of 52%. This indicates that the occupational readiness is influenced by the students' internal factors acquired during the learning process.

The internal factors could be grown, managed and developed during the learning process with a method that integrates learning environment with the real context of workforce. The students are able to learn and experience the factual conditions and the challenges of the workforce in schools. One of learning models that can be implemented in accordance with the results of this study is teaching factory learning model.

CONCLUSION

Based on the research findings and discussions, it can be concluded that the implemetation of teaching factory learning model (X) contributes significantly to occupational readiness (Y) with the percentage of 22.80% in the Study Program of Automotive Engineering Education, Faculty of Engineering, State University of Semarang. Therefore, the educators should be consistent in applying the model of teaching factory in the learning activities to foster the students' competencies in order to accomodate the industry standards. Finally, the development of teaching factory learning model, especially in colleges is expected to be continuously improved and developed. The other supporting facilities and infrastructures also should be prioritised to build the students' competency to prepare and compete within the framework of the world of work.

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