

# Artikel Widarto 10

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# Learning model development for vocational education based on industry work culture

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**Abstract:** This study aims to: (1) examine the implementation of the industry work culture learning at the Mechanical Engineering Vocational Study Program of YSU; (2) conduct a mapping of the manufacturing industry work culture in Yogyakarta Special Region and Klaten regency based on clusters; (3) measure the relevance between the manufacturing industry work culture in Yogyakarta Special Region and Klaten regency and the work culture learning at the Mechanical Engineering Vocational Study Program of YSU. The data were collected through questionnaires, open interview, and direct observation. The research instruments were Likert-type scale with four alternatives and additional comment and suggestion sheets. After the descriptive statistical analysis was applied on the data, the study finds that: (1) the score of implementation of the industry work culture learning at the Mechanical Engineering Vocational Study Program of YSU is high with 3.22; (2) there are three industry clusters in Yogyakarta Special Region and Klaten regency, with different technology advancement levels of high, medium, and low; (3) the relevance levels between the work culture learning at the Mechanical Engineering Vocational Study Program of YSU and the manufacturing industry work culture in Yogyakarta Special Region and Klaten regency according to the clusters are reported as follows: 98% for cluster I, 102% for cluster II, and 131% for cluster III. While the overall results indicate very good relevance levels, when compared with the ideal condition of the preferred work culture, it only reaches 81%. In addition, there are two aspects that still need improvement, namely the Discipline and Innovativeness aspects.

## 1. Introduction

<sup>5</sup>Manufacturing industry is an economic activity that process natural materials, raw materials, semi-finished goods, and finished goods to create a product with higher value in the use. Manufacturing industry involves the design of activity and industrial engineering. The overall activities of the industry cannot be separated with the role of human resources working in it. Human resources are the most important production factors as humans are the main essence in all aspects of life, especially in the work life. On the other hand, as social being, humans also cannot be separated with social interaction and communication. Social interaction among employees or workers in a company is imperative because a company essentially consists of a group of humans that socially interact with each other. Social interaction can be defined as the relationship between individuals or between groups, or between individual and group who are dependent on each other to the extent that they are able to affect or change the other individual's behavior.

Despite having a complex nature and many potentials for continuous improvement, industry work culture, especially in the manufacturing industry, has not received much public exposure at the moment.



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In relation to this, vocational education, which has the responsibility to generate ready-for-work graduates as the supplier for human resources, still considers industry work to be limited only in transforming natural raw materials into finished products. As a result, the learning process only focuses on the improvement of practical competence. In fact, the success in industry work is closely related not only to the worker's practical competence, but also more to the work culture of each employee. When referring to some of the bestwork cultures in industry work, one must mention the 5R initiative. The 5R initiative (*Ringkas, Rapi, Resik, Rawat, Rajin*) is an Indonesian adaptation of the Japanese work culture of 5S (*Seiri, Seiton, Seiso, Seiketsu dan Shitsuke*) which has become the foundation of the strength of Japanese industry work culture. In English, both 5R and 5S can be defined as the five virtues in industry work culture, which include Efficiency, Tidiness, Cleanliness, Attentiveness, and Diligence. This philosophy is essential for instilling positive values and work culture in the industry work setting.

This type of work culture is expected to be instilled in each employee in order to achieve productivity, and eventually the company's profit. For this reason, the development of good work culture before entering the industry working world can be a good foundation to have for graduates of education, particularly the vocational education.

Vocational education is one of the main pillar in the economy of a country, whether it is developed or developing countries due to its role as the supplier of ready-for-work graduates which can address the industry's needs as the base of the economy. A study by Slamet PH (2011) suggested that vocational education can play a big role in the economic development if it can continuously address the surrounding the working world, whether in quantity, quality, location, or time. Therefore, vocational education must ensure that both the practical competence and work culture in the vocational learning process address the industry work culture.

In order to address the work culture learning from the education perspective with the actual work culture in the industry, there needs to be an intensive research focusing on the subject. This study attempts to investigate the problem by using the Mechanical Engineering Vocational Study Program, Faculty of Engineering at the Yogyakarta State University as the research setting to represent the vocational education scope. Meanwhile, the industry was represented by the manufacturing industry in Yogyakarta Special Region and Klaten regency. To obtain the maximum result, the following steps are needed: (1) examine the implementation of the industry work culture learning at the Mechanical Engineering Vocational Study Program of YSU; (2) conduct a mapping of the manufacturing industry work culture in Yogyakarta Special Region and Klaten regency based on clusters; and (3) measuring the relevance between the work culture learning at the Mechanical Engineering Vocational Study Program of YSU and the manufacturing industry work culture in Yogyakarta Special Region and Klaten regency.

The aspects of the industry work culture aspects which became the subject of the study can be seen in Table 1 below in details.

**Table 1.** The aspects of industry work culture

No	Measured Aspects	Point Numbers
1	Discipline (diligence)	1
2	Cleanliness	2
3	Attentiveness	3
4	Efficiency	4
5	Tidiness	5
6	Commitment	6
7	Continuous Learning	7
8	Safety and Health	8
9	The "do it right at the first time" culture	9
10	The "zero defect" culture	10
11	The "zero discrepancies" culture	11
12	Professionalism	12

13	Integrity	13
14	Innovativeness	14
15	Competitiveness	15
16	Productivity	16

## 2. Research Method

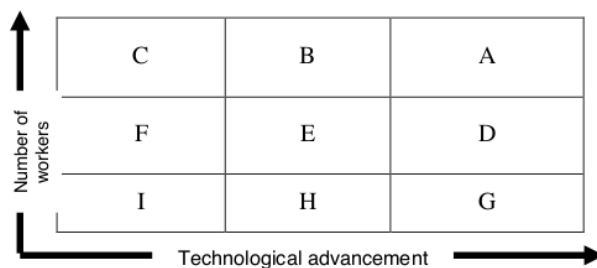
This was a survey research with quantitative approach aimed to measure the level of relevance between the vocational education work culture as seen in the learning process at the Mechanical Engineering Vocational Study Program of YSU and the manufacturing industry work culture in Yogyakarta Special Region and Klaten regency. Survey was considered to be the most appropriate method used to obtain data in certain points or parts in order to depict the condition or identify the standards between the compared subjects, as well as to determine the relationship between variables (Cohen, Manion & Morrison, 2007: 205). The research began on February 3, 2017 and ended on June 29, 2018. The research instrument validity employed logical and empirical data validity. Logical validity generally consists of content and construct validity. While content validity is used for testing the scope of instrument items on the measured object, construct validity is for assuring that the results of the used instruments address the theory (Sekaran, 2003: 207).

## 3. Results and Discussion

Based on the research aim stated in the Introduction, this study will discuss the followings:

### 3.1. The mapping of manufacturing industry work culture based on clusters

This study groups three clusters of industry in Yogyakarta Special Region and Klaten regency based on the level of technological advancement they use into high, medium, and low.



**Figure 1.** Clusterization of manufacturing industries in Yogyakarta Special Region and Klaten Regency

Figure 1 shows the clusterization of manufacturing industry in Yogyakarta Special Region and Klaten regency based on the technological advancement level and the number of employee. According to the technological advancement level, the industry is divided into three groups, namely high (A,D,G), medium (E,H), and low (C,F,I). Similarly, based on the number of employee, the industry is grouped into big (A,B,C), medium (D,E,F), and small (G,H,I). The industries with the highest level of technological advancement and the most number of employee are grouped in cluster A, while those with

the lowest technological advancement level and the least number of employee are in cluster I. Nevertheless, this study focuses on the technological advancement level due to its relevance with the industry work culture. The number of employee, on the other hand, acts as the additional variable, which is excluded from this study.

### 3.2. *The level of relevance between Mechanical Engineering Vocational Study Program of YSU and the industry work culture*

The results of the study on the implementation of the industry work culture in Yogyakarta Special Region and Klaten regency based on the technological advancement level are presented in Table 2.

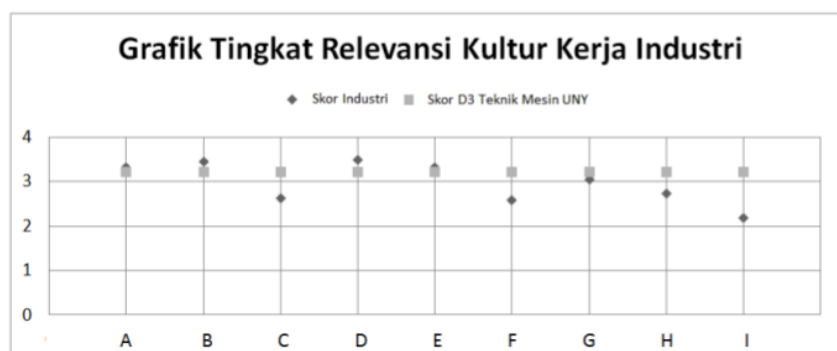
**Table 2.** Scores of the industry work culture implementation

The industry clusters		
Advanced (1)	Average (2)	Low (3)
3.32	3.45	2.62
3.48	3.32	2.58
3.05	2.73	2.19
Mean= 3.28	Mean= 3.16	Mean= 2.46
Ideal score= 4.00		
Mechanical Engineering Vocational Study Program of YSU= 3.22		
98% relevance	102% relevance	131% relevance

Table 2 shows the percentage of relevance between each of the cluster of manufacturing industry work culture and the work culture learning at the Mechanical Engineering Vocational Study Program of YSU. When compared with the three the manufacturing industry clusters, namely cluster I, cluster II, and cluster III, the relevance levels are 98%, 102%, and 131%, respectively. The percentage numbers that are over 100% mean that the implementation of work culture at the Mechanical Engineering Vocational Study Program of YSU have exceeded the needs of the manufacturing industry of the middle and low clusters. However, when compared with the ideal score, it only reaches 81%. This suggests that certain aspects of the work culture still have a room for improvement. Based on the obtained data, the aspects with the lowest scores are the Discipline (2.78) and Innovativeness (2.67) aspects.

The relevance level between the industry work culture and that in the Mechanical Engineering Vocational Study Program of YSU can be seen in Figure 2.





**Figure 2.** The relevance level between the industry work culture and work culture learning at the Mechanical Engineering Vocational Study Program of YSU

The research results indicate that the work culture in the Mechanical Engineering Vocational Study Program can be considered as satisfactory, meaning that it is still above the daily work culture in the C, F, G, H, and I industries, yet below industry A, B, D, and E. Nevertheless, this is understandable considering the fact that industry A, B, D, and E are all world class companies in hospital equipments. The responses of the questionnaires reveal that the two aspects that still have room for improvement in the learning process at the Mechanical Engineering Vocational Study Program of YSU are the Discipline and Innovativeness aspects. Consequently, they must be developed and improved further in order to meet the big industry work culture. There is only a slight gap of scores between the industry work culture and that in the learning process at Mechanical Engineering Vocational Study Program of YSU, and it is suspected that the difference was caused by work experience and different work patterns.

#### 4. Conclusion

This study shows that the industry work culture goes hand-in-hand with the industry's technological advancement. Industries with higher technological advancement arguably has a better work culture than those with simpler technology. Labor intensive industry with a great number of workers tend to have a lesser work culture. This means that the increasing number of workers must be met with a good and appropriate management control. The score of the industry work culture implementation at the Mechanical Engineering Vocational Study Program of YSU is found to be 3.22. The analysis found that this score is not quite different with the big industries in Yogyakarta Special Region and Klaten regency. Conclusively, the implementation of the industry work culture at the Mechanical Engineering Department of YSU is about 81% of the ideal condition.

In regards to the conclusion, the current learning system of industry work culture at the Mechanical Engineering Vocational Study Program of YSU must be maintained. The obtained score is already quite high and addresses the big industries in Yogyakarta Special Region and Klaten regency. Nevertheless, there still needs to be improvement for the industry work culture learning at the Mechanical Engineering Vocational Study Program of YSU, particularly on the Discipline and Innovativeness aspects.

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