Development of Industrial-Work Culture through Teaching Factory Program in Vocational Schools

Iswayuni Wulandari¹ and Sudiyatno²

¹Post Graduate Student, Universitas Negeri Yogyakarta, Indonesia
²Lecturer in Faculty of Engineering, Universitas Negeri Yogyakarta, Indonesia

E-mail: Iswahyuniwulandari.2017@student.uny.ac.id; sudiyatno@uny.ac.id

Abstract. This study aims to describe the industrial culture of SMK N 1 Kalasan. This research is an evaluation research with a gap model. The data collected came from State Vocational Schools in Sleman as reference schools, through interviews and observations, then analyzed descriptively. Indicators of industrial culture in the teaching factory are measured based on guidelines from teaching factory governance from the Directorate of Vocational Development, namely: management, team work, human resources, workshops, learning patterns, product-services, marketing production, and industrial and consumer relations. The results of this study indicate that these indicators show mostly as very good categories.

Keywords: teaching factory, industrial culture, smk, vocational education, art

1. Introduction

According to the Central Statistics Agency (BPS) the national open rate of unemployment in August 2017 reached 7 million people and as many as 1.6 million of them were vocational graduates. The ability of human resources in Indonesia needs to be improved to prepare human resources who are more professional and competent along with the development of the Industrial Revolution 4.0, for that education must play an active role in improving the quality and quantity of competence and quality human resources and can compete with the global world workforce. In the Law of the Republic of Indonesia Number 20 of 2003 states that education is a conscious and planned effort to realize a learning atmosphere and learning process so that students actively develop their potential to have spiritual, religious, self-control, personality, intelligence, noble character, and skills needed by themselves, society, nation and State.

Juridically, the basic definition of Indonesian vocational education can be found in the National Education System Law (Sisdiknas) Number 20 of 2003 article 15 states that vocational education is secondary education which prepares students primarily to work in certain fields. Vocational education in Indonesia entered a new phase in the face of global challenges in the Industrial Revolution 4.0 in the XXI century, seeing that the President issued Presidential Instruction No. 9 of 2016 concerning Revitalization of Vocational High Schools. This vocational revitalization can be referred to as the third vocational education reform, after the previous reform of the first vocational education in 1964 and the second reform in 1976.

The Ministry of Education and Culture pioneered 125 Vocational Schools which have expertise in accordance with national development priorities, namely Maritime, Tourism, Agriculture, and Creative Industries which are spread throughout Indonesia. Furthermore, the Director General of Primary and Secondary Education of the Ministry of Education and Culture (Dirjen Dikdasmen) Hamid Muhammad mentioned four points that became the focus of revitalization of Vocational High Schools (SMK) which encompassed link and match revitalization, educators & education personnel, cooperation, and
graduates. One link and match program that prepares to adjust between learning materials in vocational schools and the needs of the work / industrial world (DU / DI) namely the teaching factory.

In Indonesia, the application of the teaching factory concept was introduced in vocational schools in 2000 in the simplest form, namely in the form of the development of production units carried out in SMK. Then in 2005 the concept developed into a simple industry-based SMK development model. There are three basic forms of category of industrial-based vocational development, namely: 1) Simple industrial-based vocational development; 2) Development of industry-based vocational schools that develop; 3) Development of industrial-based vocational schools that develop in the form of factories as a place of learning. Furthermore, at the beginning of 2011 the development of the third vocational school, namely the development of industrial-based vocational schools that developed in the form of factories as a place of learning is known as the teaching factory.

One vocational school that has run the teaching factory program is SMK N 1 Kalasan since 2016. SMK N 1 Kalasan is a vocational school in the field of Craft and Tourism Arts in Sleman Regency, Yogyakarta. The expertise competencies possessed are Kria Tekstil, Kria Kulit, Kria Keramik, Kria Logam, Kria Kayu, Hospitality Accommodation, Catering Services. Several brands of teaching factory products have also been registered in Kemenhum Ham, namely Equal (leather products), Kemala (bakery & catering products), and Sekar Kalasan. Based on some of the above, SMK N 1 Kalasan was designated as a reference school for teaching factory developers in the Kria arts. This study aims to describe aspects of industrial culture that are applied in SMK N 1 Kalasan and the constraints faced in the implementation of the teaching factory.

1.1. Teaching Factory Program
Teaching factory is a concept of learning in production / service-based vocational schools that refers to standards and procedures that apply in the industry, and is carried out in an industry-like atmosphere. Teaching factory as an approach that combines learning and the work environment to produce realistic and relevant learning experiences. "Factory teaching as an approach that combines the learning and working environment from which is realistic and relevant learning experiences arise"[1](Nanyang Polytechnic, 2003).

The Directorate of Vocational Development explained that the teaching factory integrates the learning process to produce basic products that are suitable for selling to produce added value for schools, meaning that the teaching factory process can foster an entrepreneurial spirit for students. Triatmoko [2] (2009: 35) states that vocational schools are still difficult to implement production-based education, therefore the term teaching factory is raised which requires schools to have a place for students to carry out practical learning designed to resemble a real work environment. Thus in a simple teaching factory is the development of dual system education, namely Competence Based Training (CBT), and Production-based Education and Training (PBET) carried out by vocational schools.

The basic principles in carrying out teaching factory in Vocational Schools are: (1) the integration of work world experience into the vocational curriculum; (2) all equipment and materials and education actors are prepared and designed to produce products (goods and services); (3) the combination of production-based learning and competency learning; (4) in production-based learning, vocational students must be directly involved in the production process, so that their competence is built based on production needs. Production capacity and types of products are the main keys to the successful implementation of production-based learning.

The main components in implementing the teaching factory are as follows: (1) Learners; (2) teachers; and (3) school management. The three components follow the provisions contained in the national curriculum.

1.2. Work Culture in Industry
The parameters of industrial culture in teaching factory based on the book of governance in the implementation of teaching factory are as follows: Management commitment and function are important in the implementation of teaching factory which can be the spearhead for improving graduate
competencies while meeting the needs of DU / DI in the form of products / services. The management function are planning, organizing, actuating, controlling (POAC). Human resources in the teaching factory are people who give their energy, talent, creativity, and effort in carrying out the teaching factory goals. The teaching factory must have experienced human resources, be able to innovate, and be able to work well together in teams. Workshop / workshop / lab is a place of practical learning so that it must meet the standards according to the standard of basic infrastructure facilities of SMK based on Permendiknas No. 40 of 2008 which regulates the minimum criteria for infrastructure facilities. The learning patterns implemented are directed towards industry-based learning. Products in the teaching factory are media to deliver competencies and parts in the learning process. Marketing Promotion is related to the implementation of teaching factory in clarity of target, market segment, market reach, and adjusting methods and behavior of promotional activities. Industries and consumer relationship is implemented in a collaboration or cooperation between vocational schools and industry and vocational schools and consumers is the key to success in carrying out the teaching factory. As it is stated by Sunar Rochmadi [3] that the implementation of the developed model of collaboration shows that the model is feasible and effective to prepare the students with the competencies required by the world of work.

2. Method

This research is an evaluation research with a discrepancy model. The discrepancy evaluation is an evaluation of the program gap, seeing the program gap that occurs between what is expected and the implementation of the program (reality). The implementation parameter used in this study is the parameter of industrial culture in the book of governance in the implementation of teaching factory which was developed by the Directorate of Vocational High Schools. The study was conducted at SMK N 1 Kalasan in September 2018. The research data was taken from direct observation to the vocational high school and structured interviews with the deputy head of the school for the development of SMK N 1 Kalasan. The variables studied in this study include aspects of industrial culture in the implementation of teaching factory consisting of management, workshop workshop, team work, learning patterns, product-services, marketing promotion, industrial relations & consumer relations.

3. Results

3.1. Management and Team Work

Based on Table 1 it is shown that the source statement that the factory include teaching program in teaching and learning, because this is the learning process of the learning method so that those involved in the teaching factory are automatic teachers and toolman. As for the management there is in the structure of the expertise and central structure. But the point is this is a learning model to become a teacher who is directly involved in the teaching factory.

| Indicator                  | Classification |
|----------------------------|----------------|
| Appreciate ideas of others | Good           |
| Able to lead/be willing to be led | Good       |
| Care to others             | Good           |
| Prioritizing mutual success| Very Good      |

Differences of opinion often occur because this art school has its own characteristics, it is precisely what is being tried to be developed in the teaching factory according to expertise competency, there is a product standard but later each competency does have its own distinctive characteristics all must be
product oriented but the implementation is at level 1, level 2, level 3, level 4 but all are still in the teaching factory.

3.2. Workshop
SMK N 1 Kalasan is a revitalization, the ministry of SMK N 1 Kalasan is used as a pilot so that it is given assistance to refine the equipment in all departments and plans to make art galleries, the target is the end of December the repair shop, planning to make ICT space for students to explore designs and so on, then equipment also approaching industry standards.

3.3. Learning Pattern
The hallmark of the teaching factory is to implement a block system (rolling groups every week) meaning that all subjects are taught at the same time as grouping students based on the subjects and the teacher forgives according to the subjects. As an illustration, it is presented as follows: 1 class consists of 36 students divided into 4 subjects so that 1 group is 9 children, children with numbers 1-9 in Shoe lessons, 10-18 in bag lessons, 19-27 in fashion lessons, 28-36 in the cleft lesson. So at the same time 4 subjects are taught later the following week on rolling.

The advantage is when there is a bag order, it can be done by the bag group's children, when there is an order of shoes, a shoe group can do it, so every week all the product forms are there, and the teacher keeps on working. 1 teacher 2 groups of lessons according to the schedule of the center 2 teachers empowered 2 groups with different material.

The assumption is that all teachers master all competencies, when teaching and learning continues, anyone who teaches continuously for a week from Monday to Friday, and so on, the advantages of students have more practice opportunities so they will be more competent than those who do not use the block system. For example, when making bags from Monday to Friday, learning about automatic bags is more effective and efficient. The hope is in addition to competence to work but they also prepare for entrepreneurship.

3.4. Products and Marketing
Based on Table 2 it is shown that the source statement that the equipment is in accordance with the teaching factory standards using advanced standards. Because our Vocational Schools are designated as revitalization Vocational Schools in the creative industry, representatives from 6000 Vocational Schools take 5 Vocational Schools and 1 Vocational School, namely the creative industry, maritime, tourism, hospitality, agriculture, health.

| Indicator                          | Category |
|-----------------------------------|----------|
| Quality-oriented                  |          |
| Work based on standard            | Good     |
| Work on time                      | Good     |
| Work with appropriate machines and tools | Good     |
| Efficiency-oriented               |          |
| Using material efficiently        | Good     |
| Using procedures efficiently      | Good     |
| Innovation                        |          |
| Solution oriented                 | Very Good|
| New product orientations          | Very Good|

Standar operational procedure for the use of materials already in Sarpras applies to all departments, for students carry materials in accordance with the pattern, if there is no pattern the child should not take the material. But for those from which the original market orders students already know what they want to make later there is their own division to cut in large quantities, remove it per 20 pcs of ingredients and then do it when it is almost finished then give it another 20 pcs and then work again, and so on. If to train students' competencies using a roll on system ranging from design, making patterns, cutting,
siting, sewing, ornamental, to finishing done alone. But to order the production market using an industrial line system each phase is done by different people, some are cut, some are sewing, until there is a finishing process that continues until the product is finally finished. In a day students can produce 25 bags and it takes 4-5 days to produce 100 bags. To be more competent to prepare for class XII UKK children to apply the roll on system.

All department competencies have their own characteristics. Department of leather has a backpack that has been sold in Indonesia, the Jakarta directorate, MGMP teachers have also ordered, even products of SMK N 1 Kalasan have already been abroad. But for export cooperation with the company as a shipping service.

3.5. Industry and Consumer Relationship

SMK N 1 Kalasan established Artshop to sell products produced by students in teaching factory program and Edutel for hospitality. Art Gallery is currently under construction to become a display of students’ art works so that customers can see the products produced by students of teaching factory program. There is also after-sales service at Artshop as a warranty service if the product that has been purchased has been damaged in a certain period.

**Table 3. Industry-consumers relationship**

| Indicator                      | Criteria |
|-------------------------------|----------|
| Satisfaction of the clients   | Good     |
| Easy to be contacted by consumers | Good     |
| Providing post-sale services  |          |

From the narrative speakers there are things that become obstacles in the implementation of the teaching factory, namely the problem of regulation of the teaching factory which until now is not yet clear. Existing regulations must be adjusted to the revitalization program including teaching factory programs that are based on selling products in collaboration with industry and producing market orders. Local government regulation reads that all the proceeds from products sold directly deposited not to buy raw materials means that the government has not taken sides to revitalize vocational schools even though in other areas there are those who use the district general service board (Badan Layanan Umum Daerah) system or cooperative system. This has become a national problem not in Yogya alone from the Ministry of Education will make regulations on the management of teaching factories related to finance of course cooperation with the Ministry of Finance. Vocational schools cannot be equated with regional assets that must deposit income like that later the impact of vocational schools will not develop to especially the teaching factory program. Even so, that does not mean that schools are willing to take advantage of as much as possible from existing facilities in schools and regional areas but this is solely for strengthening students’ competencies.

4. Conclusion

Based on the analysis of industrial culture portraits at SMK N 1 Kalasan it can be concluded that the aspects of industrial culture in SMK N 1 Kalasan consist of management, team work, workshop- workshop, teaching patterns, product-services, marketing promotions, industrial and consumer relations shows very good category.

Acknowledgments

Authors wishing to acknowledge assistance or encouragement from colleagues, special work by technical staff or financial support from Engineering Faculty and SMK N Kalasan Yogyakarta.
5. References

[1] Nanyang Polytechnic, (2003). Teaching factory concept. http://www.nyp.edu.sg/seg/innovative-teaching-n-learning/the-teachingfactory-concept. Accessed on 04 September 2018.

[2] Departemen Pendidikan Nasional, 2003. Undang-Undang Nomor 20 Tahun 2003 tentang Sistem Pendidikan Nasional.

[3] Sunar Rochmadi. (2016). Industry partnerships learning models for surveying and mapping high schools. Jurnal Pendidikan dan Teknologi, 23, 2, p. 210-2015.

[4] Direktorat Pembinaan SMK. (2008). Roadmap Pengembangan SMK 2010-2014. Jakarta: Departemen Pendidikan Nasional.

[5] Direktorat Pembinaan SMK. (2017). Tata kelola pelaksanaan teaching factory. Jakarta: Direktorat PSMK.

[6] Instruksi Presiden Republik Indonesia Nomor 9 Tahun 2016 tentang Revitalisasi Sekolah Menengah Kejuruan dalam Rangka Peningkatan Kualitas dan Daya Saing Sumber Daya Manusia Indonesia.

[7] Kemendikbud. (2015). Grand Desain Pengembangan Teaching Factory dan Technopark di SMK. Jakarta. Diakses: 04 September 2018.

[8] Sukardi. (2012). Evaluasi pendidikan: prinsip dan operasionalnya. Jakata: PT Bumi Aksara.