

The Effect of Industrial Work Practice to Work Readiness of Vocational High School (VHS) at Indonesia

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ABSTRACT: From August 2016 to August 2017, there are as many as 7.4 million unemployed, due to the difference between the quality of power needed by the industry and the ability of applicants. Paying attention to these data, a number of questions can be asked: (1) why does the phenomenon of Vocational Schools mentioned above occur?; (2) Are the eight national education standards not implemented; and (3) how far is the influence of industrial work practices on the work readiness of vocational students? From a number of these questions, which will be examined and discussed in this article is the question no. 3, namely how far is the influence of industrial work practices on the work readiness of vocational students? This research was conducted by using a literature study method on related references, and a number of reports and research journals on "the influence of industrial work practices on vocational students' work readiness", followed by FGD. The study found that: (1) industrial work practices (apprenticeship) are a tangible manifestation of the implementation of dual system education in order to obtain "link and match" in learning programs in vocational education; (2) the implementation of internship has a positive influence on work readiness (in addition to other factors such as career expectations and work motivation); (3) internship activities can provide student experience and technical skills needed as their provision to enter the workforce; (4) The internship program needs to be arranged jointly between the school and the industrial world in order to increase the intensity of the implementation of internship and meet the needs of vocational students.

KEYWORDS: Vocational, infrastructure, dual system education; industrial work practices, and work readiness.

I. INTRODUCTION

The aims of education in Vocational Schools include: (1) preparing students to continue to higher education; (2) increasing the ability of students as members of the community in conducting reciprocal relations with the surrounding social cultural and natural environment; (3) increasing the ability of students to develop themselves in line with the development of science, technology and art; and (4) preparing students to enter employment and develop professional attitudes. How far the goal of vocational education is achieved, it seems that it is still a challenge for the Indonesian nation as a whole.

According to the Secretary-General of the Ministry of Industry (Munandar, 2018), that: (1) starting in August 2016 until August 2017, there are as many as 7.4 million unemployed, due to the difference between the quality of labor needed by the industry and the ability of applicants; (2) based on the results of World Bank research that Indonesia takes 45 years to catch up in the field of education, and it takes 75 years to catch up in the field of science. Therefore the Secretary-General of the Ministry of Industry (Munandar, 2018) said that increasing HR capacity was one of the government's priority policies at this time in order to encourage national economic equality, after infrastructure development. To create skilled human resources it is necessary to strengthen the education system, one of which is through vocational education.

In line with the data above, the Minister of Industry of the Republic of Indonesia (Hartarto, 2018) explained that currently there are as many as 3.3 million graduates from secondary schools in Indonesia, while existing universities can only absorb as many as 1.7 million students. Therefore around 1.6 million students must be directed to enter the labor market, so as not to increase the unemployment rate. However, the majority of them, after graduation, are not ready to work. This condition occurs, because the practice facilities and equipment owned by SMKs in Indonesia on average, are left behind two generations. With the "link and match" program, it is expected that vocational students can learn directly the current generation of production machines, which are used by industry in their production processes.

Taking into account the data above, the following questions can be asked: (1) why does the phenomenon of Vocational High School (VHS) mentioned above occur?; (2) Are the eight national education standards not implemented? (3) how far do VHSs have a number of teachers, especially productive teachers; (4) how far do VHSs have the necessary infrastructure ?; (5) how far has a dual system education program (DSE) been implemented? and (8) whether vocational learning has been carried out with the principle of "demand-driven for future" so that unemployment or waste does not occur, as stated by Sudira (2018, p. 52). From a number of these a questions, which will be examined and discussed in this article is question no. 7, namely how far is the influence of industrial work practices on the work readiness of vocational students?

II. THEORITICAL REVIEW

In the Minister of Industry Regulation Number 3 of 2017 concerning Guidelines for the Development and Development of Competency-Based Vocational High Schools, it is stated that the industry can develop as many as five Vocational Schools in their region, and each Vocational School can be fostered in more than one industry. To that end, the Ministry of Industry of the Republic of Indonesia implements industrial labor development policies in accordance with the mandate of Law No. 3/2014 on industry, and Government Regulation No.41 of 2015 concerning the development of industrial human resources through the following programs: (1) development industrial vocational education; (2) industrial apprenticeship; (3) competency-based industry training; and (4) competency certification such as, shown in Figure 1. below.



Figure 1. Workforce Development through the industrial vocation program and development of vocational industries by 5 related ministry (Source: Ministry of Industry of the Republic of Indonesia)

Furthermore, in accordance with Presidential Instruction No.9 of 2016 concerning revitalization of vocational education, that the development of vocational education (check Figure 2) includes: (1) preparation of distribution maps and industrial development projections; (2) preparation of maps of distribution of vocational and vocational education units; (3) preparation of maps of labor requirements and availability of prospective industrial workers; (4) preparation of industry and vocational education units; (5) development and preparation of supporting infrastructure for the competence of teaching staff and certification of prospective industrial workers; (6) preparation of fieldwork and / or apprenticeship industry; (7) providing instructors from industry; and (8) improving the quality and quantity of facilities and infrastructure for vocational and vocational education units.

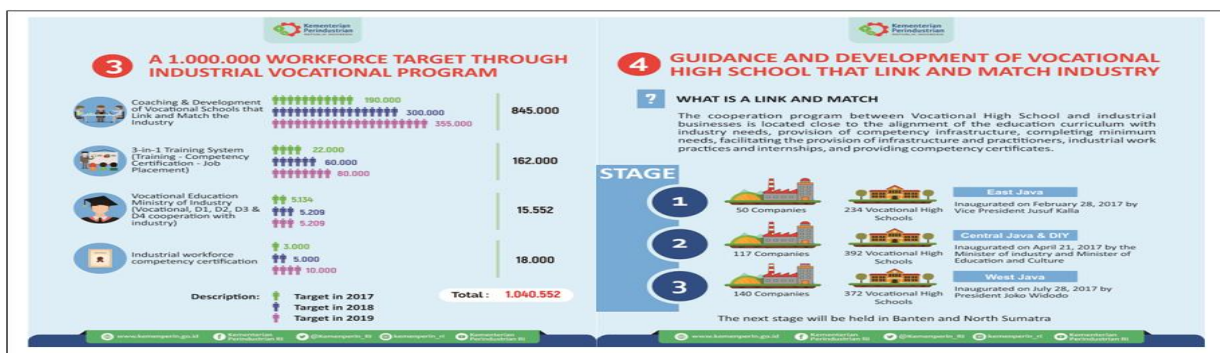


Figure 2. Workforce target through the industrial vocational program & Guidance and development of vocational school that link and match industry (Source: Ministry of Industry of the Republic of Indonesia)

In 2019, the Ministry of Industry of the Republic of Indonesia (Widiartanto, 2018) targets industrial vocational education programs to involve as many as 1,775 VHSs and 355 companies with an estimated number of certified graduates of 845,000 (check Figure 3). In order to meet these targets, starting in 2017 the guidance and development of Vocational Schools that have "link and match" with as many as 234 VHSs with 50 companies on February 28 2017, as many as 392 Vocational Schools with 117 industries on April 12, 2017 and 372 Vocational schools with 140 industries on July 28, 2017 (check Figure 4). In line with this policy, Minister of Manpower Dhakiri (Widiartanto, 2018) said that: (1) vocational education will focus on six industrial sectors, namely manufacturing, agribusiness, tourism, health, migrant workers and the digital economy; (2) in principle, there must be a balance between "supply" and "demand" of labor; and (3) investment through vocational education and training must be in accordance with market needs. Vocational learning without clarity on the orientation of fulfilling "demand driven for future", will be futile and a wasteful activity (Sudira, 2018, p. 52). In line with that there are three stages of vocational education, namely: (1) conventional schools that have not been oriented to market needs; (2) schools that have implemented "link and match" with the industry so that the curriculum can only adjust to the needs of the industry; (3) schools that implement "dual systems", with school learning activities and industry practices, whose portions are balanced. Because humans are designed by nature, to combine knowledge and action (Johnson, 2014, p. 50). Along with Barab and Landa's opinion (Johnson, 2014, p.120), that when students associate academic subjects and apply them in real-world situations, they will find meaning, remember lessons, and their IQ increases. Because the brain sees meaning in it, and given its use in real-life situations, combining school learning with the world of work is very reasonable (Johnson, 2014, p.122). The more authentic, real and contextual learning is, the more meaningful and impactful the students are concerned with (Sudira, 2018, p.50). This type of education model is an educational model that is commonly implemented in Europe, especially in Germany.

The "link and match" and "dual system" programs as described above are actually in line with 16 Prosser propositions. Dr. Charles Allen Prosser (1871-1952) is a US practitioner and academic who is often regarded as the father of vocational education, especially in America. Prosser is a teacher of Physics and History at New Albany High School and has a Ph.D from Columbia University. In vocational and vocational education academics in Indonesia, the Prosser name is quite well known as the compiler of 16 Principles of Vocational Education (which is often referred to as the 16 Prosser Propositions). Prosser believes that schools must help students get jobs, maintain jobs and move forward in their careers. Therefore according to Prosser, there must be a vocational school for the public as an alternative to existing public schools. The vocational school in question is a school that provides lessons for various types of work in the industry.

The principles of vocational education according to Prosser & Quigley (1950) are: (1) vocational education will be efficient, if the environment in which students are trained, is a replica of the environment where they will later work; (2) effective vocational education can only be provided where the training tasks are carried out in the same way, tools and machines as specified in the workplace; (3) vocational education will be effective if it trains someone in the habit of thinking and working as needed in work; (4) vocational education will be effective if it can enable each individual to capitalize on his interests, knowledge and skills at the highest level; (5) effective vocational education for every profession, position or job can only be given to someone who needs, who wants and who benefits from it; (6) vocational education will be effective if the training experience is to form work habits and correct thinking habits, repeated so that they are appropriate for the future work; (7) vocational education will be effective if the teacher has had successful experience in applying skills and knowledge to the operations and work processes to be carried out; (8) at each position there is a minimum ability that must be possessed by someone so that he can continue to work in that position; (9) vocational education must pay attention to market demand; (10) the process of fostering effective habits in students will be achieved, if training is given to real work; (11) a reliable source for knowing the content of training in an occupation, is from the experience of the occupational experts; (12) each job has body of content that varies from one another; (13) vocational education will be an efficient social service, if it suits one's needs and is most effective if done through vocational learning; (14) vocational education will be efficient, if the learning methods are used and personal relationships with students consider the characteristics of these students; (15) the administration of vocational education will be efficient if it is flexible; (16) vocational education requires certain costs and if not fulfilled, vocational education should not be forced to operate.

In order to carry out the sixteen principles of vocational education from Prosser above, learning in Vocational Schools is carried out through dual system education. Dual system education is a form of professional expertise education, which integrates systematically and synchronously between school education programs and business programs obtained through direct work in the workforce to achieve a level of professional expertise. Where professional expertise can only be formed through three main elements, namely science, technique and tips. Science and technique can be learned and mastered when and where students are, while tips cannot be taught but can be mastered through the process of doing work directly in the field of the profession itself.

Dual System Education (DSE) is carried out to meet the needs of a professional workforce in their field. Through DSE it is hoped that a professional workforce can be created. Students who implement DSE are expected to be able to apply the knowledge acquired and at the same time study the industrial world. Without DSE, students cannot go directly into the industry, because they do not know the situation and conditions of the work environment. In addition, the company cannot know which workforce is professional and which workforce is less professional. Thus, DSE must indeed be implemented because it is in line with Proser's argument about vocational education, and can benefit all parties. DSE aims to: (1) produce workers who have professional expertise (with a level of knowledge, skills and work ethic that is in accordance with the demands of employment); (2) strengthening the "link and mechanism" between schools and the world of work; (3) improving the efficiency of the education process and training of professional quality workforce; and (4) giving recognition and respect for work experience as part of the education process.

METHODS

This research is a literature research as an information gathering activity that is relevant to the topic used as the object of research (Notar & Cole, 2010). The data collection technique was carried out by conducting a study of vocational education books and related government regulations as well as relevant research results on multiple education systems, industrial work practices and factors that affect vocational student work readiness. Data analysis technique used is to describe data and information in sentences that are easily understood as an effort to get answers to the problems studied (Sugiyono, 2006), related to the effect of industrial work practices on vocational students' work readiness.

III. RESULT AND DISCUSSION

There are a number of studies that look at industrial work practice procedures, and several factors that influence the work readiness of vocational students. Fitriyani, Sukirman, and Hamidi (2014) conducted a study entitled "Efforts to Increase Work Readiness of Students Graduates of Vocational High Schools in Karanganyar District (Case Study at 1 Karanganyar State Vocational School) concluded that: (1) 1 Karanganyar State Vocational School has made efforts in increasing work readiness of students through teaching and learning activities, industrial work practices, pickets at school, industry visits as well as providing career motivation and guidance; (2) there are constraints faced by schools in an effort to improve student work readiness, namely the constraints of financing, time management, curriculum and evaluation systems, low motivation of students, less optimal participation of business/ industrial partners; and (3) efforts made by schools to overcome these obstacles, are to utilize production units in schools, use time effectively and efficiently, utilize discussions between teachers, provide motivation through various activities, and find business partners/industries that are in accordance with the objectives program.

Related to the procedures and benefits of apprenticeship, Oktaviastuti, Dardiri, and Nindyawati (2016) reported in his research journal entitled "Improving the Technical Skill of Building Engineering Vocational Students Through the Implementation of Industrial Work Practices" which concluded that: (1) internship is a tangible manifestation of education dual system; (2) apprenticeship programs need to be arranged jointly between schools and the industrial world in order to meet student needs; (3) parties active in internship activities include students as implementing parties, and industry and teachers as parties who train students; (4) internship activities can give students experience before entering the workforce; and (5) through internship activities, students obtain technical skills needed as provisions to enter the workforce. The results of this study provide clues, the better the implementation of parking, the better vocational students gain learning experience and technical skills in the real work environment, so students are more ready to work when they graduate later. Therefore the program and curriculum of apprenticeship must be prepared through synchronization between the school and the industry. The quality of apprenticeship curriculum through synchronization greatly determines the quality of learning experiences and technical skills for students.

Some studies show that there are several factors that influence the level of work readiness of vocational students. Damasanti (2014), through a study entitled "Work Readiness Judging from Work Motivation, Entrepreneurship Attitudes, and Women's Fashion Skills Competencies in Vocational High School Students" found that (1) work motivation, entrepreneurial attitudes, and competency in women's clothing expertise were able to explain work readiness ; and (2) partial correlation analysis shows that there is a significant relationship between the independent variable and the dependent variable. The recapitulation of the three independent variables shows that the largest partial correlation coefficient is in the relationship between work motivation and work readiness, then the competency of women's clothing expertise with work readiness, and entrepreneurial attitudes with work readiness of vocational students. This means that to improve work readiness of vocational students, it can be done by increasing work motivation variables, competency in women's clothing skills, and entrepreneurial attitudes. The higher the work motivation, the competency of women's clothing expertise, and the entrepreneurial attitude, the higher the level of work readiness.

In line with these findings, Eliyani, Yanto, and Sunarto (2016) in a study entitled "Determinants of Work Readiness of Class XII Vocational Students in Accounting Skills Competencies in Semarang" found that: (1) student competencies did not directly affect work readiness; (2) student competence indirectly influences work readiness through self-efficacy; (3) knowledge of productive training eyes does not directly affect work readiness; (4) knowledge of productive training eyes has an indirect positive effect on work readiness through self-efficacy; (4) family support does not directly affect work readiness; (5) family support indirectly influences work readiness through self-efficacy; (6) family support indirectly influences work readiness through internship experience; (7) internship experience has a direct effect on work readiness, (8) internship experience has an indirect positive effect on work readiness through self-efficacy; and (9) self-efficacy has a direct positive effect on work readiness. In connection with that, Eliyani, Yanto, and Sunarto (2016) suggest: (1) "students should increase self-confidence and improve experience in internship; and (2) the business world provides opportunities for students to internship, as a comfortable learning place ". When students see meaning in their work, when they are invited to apply new lessons to situations that touch their lives, they will persist until they succeed (Johnson, 2018, p. 263). Through apprenticeship, students know the benefits of competence, both competencies concerning skills, thinking and work process skills. According to Hadi, Hasan, Razzaq, and Mustafa (2015), there are at least six skills obtained by students through internship namely: (1) caring to observe; (2) assess; (3) ask; (4) imagine; (5) remembering; and (6) asking questions and evaluating. The results of this study provide guidance that the ability to remember, observe, assess, ask, imagine, and the ability to provide evaluations for vocational students, can be trained through apprenticeship. The better the implementation of the internship, the better the six abilities. The results of this study are in line with Johnson's statement (2014, p.91) which states that when students can associate content from academic subjects such as mathematics, and natural sciences, with their own experiences, they find meaning, and meaning gives them the reason to learn. Therefore, in order to improve the various abilities of vocational students, combining school learning with the world of work, is very reasonable (Johnson, 2014, p.122).

To find out some factors that influence the level of work readiness, Sirsa, Dantes, & Sunu (2014) have reported the results of their research through a journal entitled "Contribution of Career Expectations, Work Motivation, and Industrial Work Experience to Work Readiness of Class XII Students of Seririt State Vocational School ", Which concluded that: (1) there was a significant contribution of career expectation factors to the work readiness of Seririt 2 Vocational High School students; (2) there is a significant contribution to work motivation on the work readiness of Seririt 2 Vocational High School students; (3) there is a significant contribution between industrial work experience on work readiness of students in Seririt 2 Vocational High School; and (4) there is a significant contribution between career expectations, work motivation, and industry work experience together to work readiness of students in Seririt 2 Vocational High School. Based on these findings, it can be concluded that career expectations, work motivation and industrial work experience significantly contribute to the work readiness of Seririt 2 Vocational High School students, both separately, and simultaneously. Industrial work practices have also been referred to as work based learning (WBL). WBL is basically a learning approach that uses workplaces as a medium for transferring learning from school to industry, thus creating an integrated experience for students (Ismail, et al., 2015).

On the other hand, Erfelina, and Ediati (2017) through a study entitled "The Relationship Between Work Readiness and Fear Facing Failure in Blora 1 Vocational High School Students" reported that: (1) there is a significant negative relationship between work readiness and fear of failure ($r = -0.288$; $p < 0.001$), which means that the higher the student's work readiness, the lower the fear of facing failure; (2) the majority of the research subjects had work readiness in the high category ($n = 179$; 62.59%) and fear of facing failure in the low category ($n = 200$; 69.93%). Furthermore, Muktiani (2014), in a research journal entitled "The Influence of Industrial Work Practices and Academic Achievement of Productive Education Courses on the Work Readiness of Class XI Students of the 2012/2013 Academic Year Patient National Vocational Accounting Expertise Program" found that there were influences of industrial work practices and achievements academic eye productive education and training accounting for work readiness simultaneously by 30.01%. Partially the effect of industrial work practices on work readiness is 3.76% and the effect of accounting productive training academic achievement on work readiness is 4.12%. In line with that, Rizqi, Kusumah, Sulaeman (2016), in a research journal entitled "Work Readiness Before and After Industrial Work Practices of Vocational Students in Bandung Regency" found that: (1) there were differences in student work readiness before and after implementing internship; and (2) there is an increase in student work readiness after internship with a percentage of 10%. The results of this study are supported by the results of the research of Pratama, Daryati, and Arthur (2018) in a research report entitled "The Relationship of Industrial Work Practices with Work Readiness of Students of Cibinong 1 State Vocational School Class XII Building Image Engineering Competence" which found that there was a significant positive relationship between industrial work practices on work readiness of students in Cibinong 1 State Vocational School Building Picture Engineering Competence, at a significance level of 5%.

Another finding that supports the research results of Rizqi, Kusumah, Sulaeman (2016), is the findings of Anggraeni, Handayani, and Sugiarti (2016) in his research journal entitled "The Effect of Implementation of Industrial Work Practices on the Work Readiness of Agribusiness Vocational School Students" who concluded that the implementation of industrial work practices has a positive influence on the work readiness of class XI students in agricultural processing technology majors at SMK Negeri 4 Garut, where the better the implementation of industrial work practices, the higher the level of readiness of student work. The results of this study support Johnson's (2014, p. 154-155) opinion, that actively seeking and combining information from workplaces, communities, and classrooms, then using it for certain reasons, will embed that information in memory, where self-learning emphasizing action, giving the brain the opportunity to feel the outside world, in countless ways. This opinion is supported by the findings of Rojuli, Rahayu and Disman (2017) who concluded that observational learning in internship has a significant positive effect on work readiness, where indicators of attention processes, retention processes, reproduction / motor behavior, and motivational processes contribute positively towards observational learning variables.

Therefore vocational learning in the XXI century, said Sudira (2018, p. 262), must be designed to provide an impressive learning experience, so that students: (1) know what is done; (2) willing and able to do what must be done; and (3) aware or aware, why should it be done. Such learning experiences, according to Usman and Tasmin (2015) are to support the acquisition of practical life skills, to make students more aware of the context of their work and better able to capture opportunities and to provide a foundation for entrepreneurs in establishing social or commercial activities. Such learning experiences are important for students who will live later on. Because according to Sudira (2018, p.200), workers of the XXI century are not only produce enough, but they must be able to build services that are fast, careful, smart and satisfying to customers. Therefore Boahin and Hofman (2013) suggest that in order to meet the demands for industrial change, competency-based industry training (CBT) in the vocational education and training system should be a priority in many countries. Competency-based industry training (CBT) will be more effective if equipped with media. Media is very influential on student learning outcomes. In line with the findings of Muslim, et al. (2018), through a study entitled "Development of electrical learning control motors as learning media support for electrical power installation courses in the department of electrical engineering, Surabaya State University", found that: (1) based on the validator's assessment, that the EMC Trainer that had been developed was very feasible to use in learning; (2) based on the assessment of students, that the EMC Trainer is very suitable to be used in learning courses in Electrical Power Installation in the Department of Electrical Engineering, Surabaya State University; and (3) EMC trainers are very effective, as many as 26 (74.28%) students have obtained learning outcomes scores in the 71-100 range, with good and excellent categories.

The learning media will provide benefits in the learning process (including in apprenticeship learning), which facilitates interaction between teacher/instructor and students, so that learning activities will be more effective and efficient (Muslim, Karno, Aribowo, and Achmad, 2018). In addition, it is also necessary to consider the use of e-learning. Soeparno and Muslim (2018) conducted a study entitled "Effectiveness of E-Learning for Vocational High School Building Engineering Program Students" found that e-learning as a learning media in building techniques has advantages, because it can be accessed anytime, anywhere, materials and tasks can be accessed easily, and are efficient in communication and discussion. Learning media in the form of e-learning as such will be very helpful in the learning process of Vocational students including psychomotor domains, both for those who have a low level of creative thinking (LLCT) and for those who have a high level of creative thinking (HLCT). Psychomotor domains for students, both those with HLCT and LLCT who study using adobe flash professional learning media, were significantly higher than students who studied using CourseLab learning media (Muslim, et al., 2018).

IV. CONCLUSION

Based on a review of a number of literature and relevant research results, and continued with focus group discussion (FGD), the following conclusions were obtained:

1. Industrial work practice (apprenticeship) is a concrete manifestation of the implementation of dual system education to obtain "link and match" in learning programs in vocational education, so that students know what to do, want and be able to do, and realize and realize why must be done.
2. Implementation of the internship has a positive influence on work readiness (in addition to other factors such as career expectations and work motivation). The better the implementation of industrial work practices, the higher the level of student work readiness.
3. Industrial internship activities can provide student experience and technical skills needed as their provision to enter the workforce of the XXI century, where they as workers, are not only produce enough, but they must be able to build services quickly, meticulously, smartly and satisfy customers.

4. The internship program needs to be arranged jointly between the school and the industrial world in order to increase the intensity of the implementation of internship and meet the needs of vocational students.

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