

The Relevance of the Vocational Education Curriculum to the Business World and Education in Vocational High Schools

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Abstract. Teachers in Vocational High Schools mostly do not have much experience involved in the field. This makes teachers unable to organize good lessons or help develop students into what industry needs or seeks. The purpose of this research is to determine the relevance of the vocational education curriculum to the business world and education in Vocational High Schools. The method used in this research is qualitative research which can describe the results of research accurately by using data provided by schools related to the Implementation of Vocational Education Curriculum in the Industrial Era 4.0 in Vocational High Schools.

Keywords: Vocational Education; SMK Curriculum; Vocational Education; Curriculum; SMK

1 Introduction

Vocational education programs have long been one of the mainstay policies of an active labor market. The basic premise of the program is that by providing the specific skills needed in the labor market, the unemployed will find better paying jobs faster. The labor supply process is carried out using a simple model, namely by screening for new skills that can increase the prospective workers' wage offer, generating job prospects above their reservation wage (Blattman C. and L. Ralston, 2015; Brown & Koettl, 2015; McKenzie, 2017). Recent studies have shown that having job-specific skills can vary over time (Forster et al., 2016; Hanushek et al., 2017). This shows the importance of having specific skills to face the immediate transition from graduating school to the first job.

Vocational education is very important for students in helping them to have the knowledge, skills and abilities or hands-on work practice. At this time, there are many situations whereby the quality of most graduates seems irrelevant to the needs of the industry. They tend to only have theoretical skills rather than practical skills. Teachers in Vocational High Schools mostly do not have much experience involved in the field. This makes teachers unable to organize good lessons or help develop students into what industry needs or seeks.

Therefore, the idea of inviting industry to take part in curriculum development and Education Management in schools is considered to be the right solution to help create collaboration between schools and the business world in developing various curricula that are very suitable to support the industrial needs (İşgören et al., 2009). The vocational curriculum is considered a grade level that has a direct influence on students (Chookhampaeng, 2003). In implementing the vocational curriculum, teachers need to focus not only on the description of the subjects taught but also the results after learning that have a direct impact on students. These include knowledge, abilities or experience of the subjects, requirements in work, and so on because they are equally important (Sermsuk et al., 2014).

However, although it is assumed that there is a relationship between vocational education and employability, students who want to take vocational education are still limited. Many studies provide strong evidence that in the short term, vocational education has a positive effect on the smooth transition from school to work (Cedefop, 2012; CEDEFOP, 2013; Golsteyn & Stenberg, 2017; Grubb & Sweet, 2008; Hampf & Woessmann, 2017). Direct vocational programs, especially internships, can increase life opportunities even with modest incomes. (Cedefop, 2012; CEDEFOP, 2013) also concluded that vocational education graduates are more likely than general education graduates to be employed and find jobs relatively quickly. For individuals from socially disadvantaged families, the probability of choosing vocational education is higher because it is commensurate with higher levels of employment and income. (Bishop & Mane, 2005; Choi et al., 2019; Kemple, James J. and Willner, 2004; Kemple, 2001) found that vocational students seem to have significantly higher wages than general education students.

Vocational education is included in one aspect of the general education process, including education about technology and related sciences and practical skills, attitudes, understanding, and knowledge acquisition (Tripney & Hombrados, 2013). In other words, vocational education is education that aims to prepare high-skilled prospective workers as a provision to develop a career in life. Therefore, the vocational curriculum must always be adapted to the needs of industrial development. Vocational curriculum must be able to adapt to the rapid and even destructive industrial development. In this 4.0 era, the development of technological advances encourages vocational education and training to meet the needs of industrial capabilities. However, graduates can also adapt to the changes that have occurred (Wolf, 2011). Vocational education must cultivate students' attitudes, knowledge, skills, and values to make them productive individuals. The success of vocational education certainly depends on students' academic achievements at school and at work.

Various economic organizations that have succeeded in revitalizing vocational education show that the main characteristics of vocational education are partnerships with industry and strong government support. In addition, the system in countries that are members of the OECD shows evidence that (1) strong industry support to provide internship experiences to students, (2) the government must facilitate and ensure that industry plays an active role in the implementation of vocational curricula, and (3) research intensive cooperation between industry and partner institutions (Yang, 2014). Therefore, concrete collaboration between schools and industry is needed to achieve quality graduates (Hanushek et al., 2017; Schröder, 2019).

However, there are several problems associated with the vocational education curriculum. For example, in South Asia, the problem is the lack of adequate practical training as part of this vocational education curriculum and inadequate connections between higher and lower vocational partner institutions (Agrawal, 2013; Mulder, 2017). Although this was a problem in the early development of vocational education in East Asia, this weakness has been overcome, including in Vietnam, where, the main difference between public schools and vocational high

schools is that the proportion of theory and practice in each school is different. Technical high school courses consist of about 40% practical courses and 60% theory courses.

Simultaneously, the vocational high school courses cover about 70% practical courses and 30% theory courses (Tripney & Hombrados, 2013). In addition, graduates of vocational high schools are eligible for university admission. However, it is different in South Asia, vocational high school graduates cannot enter technical colleges, and vocational school graduates cannot enter university. Fortunately, Vietnam has recently rectified this situation. In these two types of institutions, the ratio of theory to practice has become more standardized, and vocational school graduates can now enter university (Tripney & Hombrados, 2013). These problems can be solved computationally. Computational methods have proven successful in solving educational problems.

For example, in college, this method is used to predict student graduation (Meiriza et al., 2020), to select students on admission selection (Alejandrino et al., 2020) and to predict students who would fail and drop out of school (Márquez-Vera et al., 2013). High school is used to solve students' academic predictions (Musau et al., 2019), to predict students' performance (Pattiasina & Rosiyadi, 2020), and to predict students' final grades (Khan et al., 2015). Meanwhile, elementary schools are used for a comprehensive classification between teachers and students (Guimarães & Oliveira, 2016), for predicting students' performance (Singh et al., 2019), and for assessing students on the quality of teaching (Dardiri et al., 2020; Fauth et al., 2014). Of the many studies, the field of vocational education has not been widely discussed, hence it is still possible to develop it.

2 Research Method

The type of research that was used in this study was a qualitative method that is inductive in nature, namely by collecting, compiling, and describing various data, documents, and actual information. The materials obtained were interpreted in the form of exposure and analysis to achieve the objectives of this research. According to Sugiyono, qualitative research is a research method based on the philosophy of post positivism which views social reality as something complete, complex, dynamic, full of meaning, and the relationship of symptoms is interactive (reciprocal) (Abdul Aziz: 2005, 47). The research process began by seeking information from informants who have an important role in the development of the creative economy in the city of Medan. The assumptions and rules of thinking were then applied systematically in data collection and processing to provide explanations and arguments.

In qualitative research, the information is collected and processed by the researchers themselves. This research focused on case studies which are detailed research on an object during a certain period which was carried out completely, thoroughly, and in depth using various data sources. In relation to time and place, this research can be considered as a contemporary case study, as its objects are ongoing or have taken place but still leaves a broad, strong or special impact, and influence at the time the research.

This type of research is field research because it is based on data collected directly in the field to make observations to the object, namely at SMK YPP IPPI. The approach used is descriptive qualitative. The point is that in qualitative research the data collected is not in the form of numbers but the data comes from interview scripts, field notes, personal documents, memo notes, and other official documents. This study seeks to describe and interpret the existing data. In addition, this research is limited to express a problem or a state of events as they are, so that it is merely using facts (Nawawi, 2015).

This research was conducted at SMK YPP IPPI. Meanwhile, the object of the research was the vocational school curriculum. At the same time, the data sources used were primary data sources and secondary data sources, (Sugiyono: 2016: 225). Primary data sources are sources of data obtained or collected by researchers directly from the source. In the context of this study, the primary data source was the data obtained from the observations of researchers and interviews with the principal of SMK YPP IPPI. Simultaneously, the secondary data obtained by researchers from existing sources in the form of evidence, records, and files in the collection. In this case, the data were related to the curriculum used by SMK YPP IPPI.

To obtain the completeness of the required information in a valid and accountable manner, data collection methods used in this study were: Observation, Interview, and Documentation. The researcher took the data analysis theory from Miles and Huberman in Sugiyono (2016:338), whereby the stages of data analysis included three activity lines, namely data reduction, data presentation, and conclusion drawing/verification.

3 Results

Application of Industrial Curriculum

The application of the industrial curriculum at SMK YP IPPI is strengthened by the axioo special class program, namely the industrial class program, designed to improve students' abilities by synchronizing industrial skills with the school curriculum. In this class, a smart classroom is used as a support in increasing absorption in the teaching and learning process.

Benefits for schools include 1) Having Axioo as an industrial partner, 2) Activating School Business Centers (Authorized Axioo Service Point), 3) Being a place for TUK (Authorized Testing & Training Center Axioo and International Certification Program, 4) Being an AXIOO Teaching Factory, 5) Having modern facilities to support the teaching and learning process, and 6) Adding school accreditation points. Benefits for teachers include 1) Improving teachers' competence, 2) Being a representative of Axioo as an assessor in competency tests, and 3) Increasing teachers' accreditation points. Benefits for students include 1) Having competencies according to industry standards, 2) Having international and industrial certifications, 3) Increasing the ability to absorb material in the teaching and learning process, 4) Graduates have more competitiveness in finding jobs, and 5) Increasing entrepreneurial skills among students.

Some of the supporting programs implemented by YP IPPI Vocational School to align the school curriculum with the world of work and industry include first, Smart Factory Notebook Assembling & Troubleshooting Training, namely basic laptop assembly training in accordance with industry standards, followed by training on laptop maintenance and repair techniques. Second, Smart Classroom Fun & Smart Learning with Axioo Technology, and thirdly, Axioo Edu Board in the form of turning walls into touch screens. Leaving the old-fashioned way with whiteboards, IT-based teaching will be easy to implement with these tools (It is as easy as writing on the blackboard and as sophisticated as using a touch screen computer).

Fourth, the Classroom Management System is related to controlling what students are doing in front of their laptops, displaying the teachers' screens, and can even be used as an online exam tool. With this software, IT-based teaching would be easy to run in ALL E-Learning Portal subjects. Schools will get an e-learning portal that can be used to access teaching materials offline, to take offline exams, and to make semi-online lesson plans. The fifth program is Teaching Factory (Axioo Sales, Service & Training Center).

Moreover, the sixth tool is Axioo Training Center in the form of an authorized Testing Center for International Certification Programs and industrial competency-based training. Seventh, Computer Clinic by Axioo in the form of an official service center at school, where

students learn to repair various IT products, including Axioo as a provision for future work experiences. Lastly, Axioo Point is an incubator for Axioo's shop business, as a place for students to practice entrepreneurship. Here, students would be able to learn the organizational structure of a company, entrepreneurship, and business ethics

The development of the flow of information technology requires experts to be able to compete with domestic and foreign workers. Competition to find jobs will be even more difficult if students do not have skills that are globally recognized by the industry. Through the Axioo Class Program, every student is given the opportunity to take part in an international certification program and a capability validation program from international industries such as Microsoft, Mikrotik, Seagate, and Axioo. The certificate will be issued directly by the relevant industry parties and signed by the CEOs of the companies directly from their head office so that the validity of the certificates are more guaranteed. In addition, graduates will receive a professional certification degree and be recognized by the industry around the world.

Analysis of the Conditions and Potentials of Computer and Network Engineering at YP IPPI Vocational School

In the curriculum aspect, it has strengths in the form of K 13 combined with Microtik and Cisco Technology, and it has weaknesses in the form of structuring student schedules at teaching factories that are not yet efficient and effective. Besides, it has opportunities in the form of the Ministry of Education and Culture Regulation o. 60 of 2014 which allows for synchronization of materials according to industry's needs and threats. The development of networking technology continues to grow.

In the aspect of human resources, it has strengths in the form of teachers who have been trained in Mikrotik MTCNA and MTCTC and students who have participated in field industrial practice at PT Citra Web for 3 months. In addition, it has weaknesses in the form of some teachers who have not been trained at Microtik and Cisco. However, it has the opportunities in the form of upgrading teacher competencies about networking technology based on Microtik and Cisco with threats in the form of upgrading teacher competence on Microtik and Cisco-based networking technologies

In terms of facilities, it has strengths in the form of Networking Workshops in accordance with industry standards and it has weaknesses in the form of inadequate number of Networking workshop equipment's compared to the number of students. Nonetheless, it has opportunities in the form of networking workshop development which is still ongoing as well as threats in the form of procurement of the latest networking tools and literature.

In the Financing aspect, it has strengths in the form of all costs for teaching factories from the government and schools and has weaknesses in the form of slow money turnover. It, nonetheless, has the opportunity to benefit from voucher sales services as well as threats in the form of captive markets expanding beyond the nearest areas. In the management aspect, it has strengths in the form of the principal as the person in charge and the head of the commanding officer as the chief executive. In the meantime, it has weaknesses in the form of limited ability of good teaching factory management and it has opportunities in the form of building a representative teaching factory management system and threats in the form of not many competitors who have been running teaching factories with representative management.

In the aspect of Regional Potential, having a large Wi-Fi penetration along with the increase in smartphone use can be considered as strengths. It has a weakness in the form of increasing operator internet services resulting in fierce competition. Furthermore, it has an opportunity in the form of mobile phone and laptop/computer users competitive in price and threats in the form of large operators selling data packages with cheap prices.

Production Plan

The competence of computer and network engineering skills at the YP IPPI Vocational School is developed through Teaching Factory activities that are directly related to the implementation of the industrial curriculum at the school. Some of the teaching factory activities that can be developed include 1) Wi-Fi voucher base, 2) ISP: Hosting, Website, 3) Computer and laptop repair services, CCTV and 4) Outdoor-Indoor billboards.

Product priorities include Wi-Fi Voucher Sales for students, teachers, employees of SMK YPIPPI Cakung and the general public; ISP hosting for schools or educational institutions; laptop, computer, CCTV repair services; and network installation. Steps of business work carried out include 1) Preparing human resources and equipment needed, 2) implementing appropriate business strategy, 3) conducting appropriate market penetration, 4) marketing, 5) preparing customer service

Implementation of industrial curriculum

Types of work that realize the implementation of the industrial curriculum at SMK YP IPPI are in the form of My Hotspot Id Vouchers with job analysis include 1) Consumer Acceptance, 2) Checking network conditions and wifi vouchers, 3) Receiving consumer complaints about Wifi networks and/or vouchers, 4) Submitting possible actions to be taken, 5) Implementation of follow-up, 6) Inspection (Quality control) of the wifi network, 7) Confirmation to consumers, and lastly 8) Reporting activities. The work plan is approved by the service advisor/teacher. In carrying out the work it is adjusted to the plan based on the SOP. We check the results of the work by means of a test or final check by students accompanied by a service advisor/teacher. The transaction administration process flow is done according to the SOP.

The results of the research provide the discovery that the business world and the industrial world, Vocational High Schools (SMK) have done their best in designing school partnership programs with the business world and the industrial world in promoting their students in their respective majors. In this case, the school is very fully functional in promoting its students and as a result the school is able to provide donations to the business world and the industrial world who have collaborated in providing training to students as a place of application for students and as an internship place for students to prepare students when they enter the industrial world.

The forms of cooperation made by schools with the business world and industry include curriculum synchronization, apprenticeship/prakerin programs, training program collaborations, and graduate distribution programs. The collaboration that the school runs is the main program of the school in the field of public relations which only aims to channel students into the industrial world according to their field of expertise.

4 Discussion

The results of the research found by the researchers are in line with the theory put forward by (Putra & Hariyati, 2017) which says that Vocational High Schools (SMK) with the business world through link and match as a form of partnership can provide benefits in terms of the roles of technology in the business world so that after graduation, it will no longer be awkward to deal with technological processes in the business world. Vocational High School (SMK) students are also given motivation to create new innovations because they have seen it firsthand.

Moreover, the partnership is able to improve the quality of Vocational High School (SMK) graduates because in the business world the most important thing is discipline so that they can continue to survive. One small example which indicates that quality has begun to blossom in

school is a commitment to time and learning discipline, work ethic, a culture of competition and achievement. The partnership has also made it easier to design a competency-based curriculum because it directly meets the demands of the business world.

The partnership has also eased labor recruitments, that is, Vocational High School (SMK) stakeholders can recommend any student who excels to become a workforce. This is also supported by the results of research conducted by (Widodo et al., 2020) who reported that the partnership between learning institutions and the business/industry world is the main key to the success of implementing the industrial curriculum in Vocational Schools, where learning arrangements are designed, implemented and evaluated together, so that the relevance of graduates' competencies to the demands of the labor market increases. A marker of relevance related to the partnership between schools and the business world as well as the industrial world is a match between areas of ability and type of work and absorption in the world of work.

Based on the author's analysis, the implementation of good and mutually beneficial cooperation between Vocational High Schools (SMK) and the business world and industry is very important to support the achievement of special school programs in the field of public relations.

The results of this research when compared with previous studies are more comprehensive as they cover the development of the partnership between Vocational High School (SMK) curriculum with the business world and the industrial world. This matured relevance of the partnership has been made possible through various strategies. First, schools have been proactive in carrying out communication with the business world and the industrial world in synchronization curriculum. Secondly, schools submit proposals to industry according to schools' abilities (graduate placement, teacher OJT).

Thirdly, schools are actively exploring activities related to school promotion, and fourth schools invite certain individuals from the business world and industry as guest teachers, offer places for field industrial practice, school funding, and scholarships, as well as give outsource opportunities for graduates to the industry. Lastly, the schools also formalize their cooperation with their partners in the business and the industrial world in the form of an MoUs.

5 Conclusions

The implementation of partnerships between Vocational High Schools (SMK) with the business and the industrial world was carried out through an MoU, the contents of which were in accordance with the agreed areas of cooperation, including curriculum synchronization, industrial visits, guest teachers, internships, vocational competency tests (UKK), teacher OJT, certification, encouragement of practical equipment, school funding, scholarships from industry, as well as recruitment/job placement for graduates. The results of the partnership were still not optimal, making the placement of graduates in work did not match the competencies possessed by students.

Controlling the Implementation of the Vocational High School (SMK) Partnership Program with the Business World and the Industrial World is needed. This effort can be implemented by employing and carrying out increased training for Vocational High School (SMK) students, as well as partnering with partners, either from the Business World and the Industrial World in the industry, or industry in the vicinity according to the competence and the ability of each student. This research suggests the importance of high commitment in implementing a curriculum that can adapt to the expectations of the industrial world where students are ready to work with the required skill and competencies.

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