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**Degree of Master of International Studies
(International Area Studies)**

**Challenges for Indonesia Vocational Education and
Training System in the Process of Incorporating
Dual Vocational Education and Training System**

August, 2018

Development Cooperation Policy Program

Graduate School of International Studies

Seoul National University

Astrid

**Challenges for Indonesia Vocational Education and
Training System in the Process of Incorporating
Dual Vocational Education and Training System**

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by

Astrid

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Challenges for Indonesia Vocational Education and Training System in the Process of Incorporating Dual Vocational Education and Training System

(Professor Hyeok Jeong)

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Astrid

Confirming the master's thesis written by Astrid

August 2018

Chair: Prof. Rhee, Yeongseop

 (Seal)

Vice Chair: Prof. Song, Jiyeoun

 (Seal)

Examiner: Prof. Jeong, Hyeok

 (Seal)

Abstract

The young generation is expected to be the assets to contribute to the great and strong economic growth in Indonesia. Indonesia's current economic condition is growing rapidly. However, there are still a lot of numbers of unemployment. One of the causes of this problem is the different skills demanded in the industry and those available in the market. The existing vocational schools were unable to place their graduates in the market. To overcome this problem, Indonesia is trying to take a closer look at the Dual Vocational Training and Education System. This system is believed to be a win-win solution for the industry and the labor. The government also established the Association of Advanced Politekniks Indonesia (APII) in the early 2017. APII is a formally registered industry and school platform aiming at the involvement of the industry in the vocational education in Indonesia with industry as association members. The vocational education and training System applied in Switzerland, Germany and South Korea also provided several features that can be adopted by Indonesia to improve their application of the dual vocational education and training System.

Keywords: Dual VET System, Challenges, Best Practices, APII

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List of Abbreviations and Acronyms

AK	Akademi Komunitas (Community Colleges)
APII	Association of Advanced Politekniks Indonesia
ASEAN	The Association of Southeast Asian Nations
ATMI	Akademi Teknik Mesin Indonesia (Technical Academy of Industrial Engineering Polytechnic)
BIBB	Bundesinstitut für Berufsbildung (The Federal Institute for Vocational Education and Training)
BIZ	Berufsinformationszentren (the centers for occupational information)
BLK	Balai Latihan Kerja (Vocational centers)
BMBF	Bundesministerium für Bildung und Forschung (The Federal Ministry of Education and Research)
BMWi	Bundesministerium für Wirtschaft und Technologie
BNSP	Badan Nasional Sertifikasi Profesi (National Professional Certification Agency)
BPS	Badan Pusat Statistik (Statistic of Indonesia)
CET	Continuing Education and Training
DGHE	Directorate General of Higher Education (MOEC, Indonesia)
DVET	Dual Vocational Education and Training
EHB	Eidgenössisches Hochschulinstitut für Berufsbildung
FVB	The Federal Vocational Baccalaureate
HRD	Human Resource Department
IA-CEPA	Indonesia-Australia Comprehensive Economic Partnership Agreement
ILO	International Labor Organization

IQF / KKNI	Indonesia Qualification Standard / Kerangka Kualifikasi Nasional Indonesia)
ISO	International Standard Organization
KMK	Kultusministerkonferenz (Ministers for Education and Cultural Affairs)
LSP	Lembaga Sertifikasi Profesi (Professional Certification Institute)
MEES	Multi Entry Multi Exit System
MEST	Ministry of Education, Science and Technology
MHS	Meister High School
MOEC	Ministry of Education and Culture
MOEL	Ministry of Labor, Rep. of Korea
MOF	Ministry of Finance
MOM	Ministry of Manpower
MORA	Ministry of Religious Affairs
MoU	Memorandum of Understanding
MRO	Maintenance, Repair and Overhaul
MSOE	Ministry of State-Owned Enterprise
NCS	National Competency Standards
NTQ	National Technical Qualification System
OECD	The Organisation for Economic Co-operation and Development
OPET	Federal Office for Professional Education and Technology
P4TK	Pusat Pengembangan dan Pemberdayaan Pendidik dan Tenaga Kependidikan (Center for Development and Empowerment of Educators and Education Personnel)
PET	Professional Education and Training
PISA	Program for International Student Assessment
PNS	Pegawai Negeri Sipil (public servants)

Polman	Politeknik Manufaktur (Manufacture Politechnic)
SBBK	Schweizerische Berufsbildungsämter-Konferenz (Swiss Conference of VET/PET Agencies)
SFIVET	The Swiss Federal Institute for Vocational Education and Training
SMA	Sekolah Menengah Atas (General Senior Secondary School)
SMK	Sekolah Menengah Kejuruan (Vocational Senior Secondary School)
SOE	State-Owned Enterprise
TVET	Technical and Vocational Education and Training
UN	United Nations
USAID	United States Agency for International Development
VET	Vocational Education and Training
VSSS	Vocational Senior Secondary School
WEF	World Economic Forum

Chapter I

Introduction

1. Background

In the midst of the uncertain economic situation, Indonesian Government is committed to maintain the good macro-economic fundamentals, monetary, and fiscal policy. Their efforts in improving the investment climate and accelerate infrastructure development are expected to stimulate investment in the business sector. In this accelerated development year, the government focused on three groundbreaking step for the poverty alleviation, unemployment, and social inequality. These three steps include speeding up infrastructure development, preparation of production capacity and human resources as well as deregulation and de-bureaucratization.

The young generation is expected to be the assets to contribute to the great and strong economic growth for Indonesia. Indonesia's current economic condition is growing rapidly. However, there are still a lot of unemployment. This is happening due to the different skills from those needed in the industry than those available in the market.

Recently, Indonesia is trying to take a closer look at the Dual Vocational Training and Education System. In this system, students are required to learn at two places, at school and at the industrial sites. This process synergy education and industry or local partners. The government of Indonesia hopes that by applying this system, industrial sector can

absorb the manpower particularly the younger generations to come. Therefore, it is important to see Indonesia's challenges in applying the Dual Vocational Training and Education System.

Indonesia's Dual VET program is a part of its program to develop its Industrial Priority Sector up to 2035. Dual VET is believed to be a win-win solution for the industry and the labor. However, if a country willing to use another country's vocational education and training system, they need to adjust to the existing education, social and economic situation. A lot of thing need to be in our consideration in order to reform the education system and it might need a long process as well as time.

This research attempts to look for the challenges in Swiss Dual Vocational Training and Education for Indonesia in applying the Dual VET system. We will start by describing Swiss, German and South Korean Dual Vocational Training and Education System as well as an Indonesia current system of Dual VET. This research will compare their application to find the best method of Dual VET application to Indonesia's Dual VET system. We will try to utilize the Ministry of Industry regulation No. 3/2017 about the "Guidance on Development and Development of competency-based SMK that Link and Match with the industry" and the Memorandum of Understanding (MoU) of 5 Ministries about Development of Vocational Education Based on Link and Match Competency with Industry". By using this information, we will also try to see the differences between the role of government, training and private agency, and the local authority.

2. Statement of the Problem

Back in 2012, Indonesia had 10,256 vocational schools at senior secondary level. However, the graduates were unable to meet the market demand. Even though Indonesia already started the vocational schools since long time ago, Indonesia still faces a lot of obstacles to the application of the system. Currently now, a huge number of worker graduated from secondary qualification serve the low-skill occupations. From this observation we may tell that even though they are holding the degrees, they are lack of the “right” skills which suitable with their background. Allen (2016) mentioned that 52% of the employed population were underqualified for their positions in 2015. McKinsey (2012) predicted that the demand for semi-skilled and skilled workers may reach 113 million in 2030. This means that the skills shortage and skills mismatch will worsen throughout the Indonesian economy.

Furthermore, in preparing the industrial era 4.0, which involves digital elements in each value chain of its manufacturing processes, it is required to have skilled workers who are able to adapt to technological developments. Employers in the industrial sector are expected to provide input to the educational curriculum in accordance with technological developments as well as to provide practical facilities and apprenticeship for students and teachers/lecturers so that both learners and educators can keep up with the latest technological industry developments. Therefore, developing a comprehensive school system by collaborating with respective actors such as the employer and educational institutions is necessary to create an abundant pool of skilled workforce.

3. Significance of the Study

Aligned with the National Industrial Development Master Plan (RIPIN) 2015-2035 and the National Medium Term Development Plan (RPJMN) 2015-2019, the findings of this research study will be served as significant tools for supporting the government officials and the policymakers to set up policy agendas and to structure the Dual VET system based on the current status and lessons learn from other countries.

VET is not a new concept in Indonesia. It's already been there since the Dutch colonial rule and the existence is sporadic these days. Even though Indonesia already started the vocational schools a long time ago, Indonesia is still faces a lot of obstacles in applying the system. The VET in Indonesia has not been successful as it hoped. They were unable to place their graduates in the market. Therefore, incorporating the vocational schools into a comprehensive school system is required.

This research will try to utilize the Ministry of Industry new regulation No. 3/2017 about the "Guidance on Development of the competency-based SMK that Link and Match with Industry". This new regulation mentions about how Indonesia can support the development of the VET system by defining we should prepare regarding trainer, curriculum, funding and institutions. By comparing the Dual VET system with Germany, Switzerland and South Korea, we try to analyze the best practices of those systems are for Indonesia's Dual VET system.

The findings of this research study will be served as significant tools for supporting the government officials and the policymakers to set up policy agendas and to structure the Dual VET system based on the analysis of current status and lessons from other countries.

4. Purpose of the Study

The purpose of the research is to analyze the best method and strategy of Dual VET system in application to Indonesia's Dual VET System, by comparing the system of countries which we consider to have good practices of VET System. This research will investigate the differences of responsibilities among the Dual VET actors in Indonesian education systems, discussing the new roles set by the government in 2017.

5. Research Methodology and Research Questions

This research will be a comparative analytical study. Primary documents collected from the government institutions, including the Ministry of Industry. Secondary documents from the international development partners, and scholars to meet the data shortage from the government institutions.

Firstly, this research will try to analyze the Dual VET System in Germany, Switzerland, and South Korea. The analysis can start from the institution, training regulation, problems within the system, the structure of the Dual VET System, teacher and trainers and funding for the Dual VET system. After comparing each system, the Author will try to combine

the possible scheme for Indonesia to adapt. Later, the analyses of the Indonesia's Dual VET system will also concerning about the recent regulations that already set into force and about to implement by the government and other related parties.

The aim of this project is to define the best method for Indonesia in applying the VET System. A lot of institutions will work together, the education institution, government institution and private sectors. In order to make this connection clear, the function of each institution should be made clear. The following are the questions to be asked:

1. What are the challenges of the application of the Dual VET system in Indonesia?
2. What are the essential differences between the responsibilities of all actors within the Dual VET System in Indonesia and those in Germany, Switzerland and South Korea?
3. What can be the best practices from the existing Dual VET system in Germany, Switzerland and South Korea?
4. How Dual VET through link and match system supply Indonesia's industrial need of skilled human resources?
5. How Indonesia can maximize its opportunity in applying Dual VET System?

6. Research Limitations

- a) The responsibilities of 5 Ministries as stipulated in the MoU about The Development of Vocational Education which is linked and matched with the industry.

- b) The scheme of applying the VET system that mentioned in Ministry of Industry regulation No. 3/2017 about the “Guidance on Development of the competency-based SMK that Link and Match with Industry”.
- c) During the process, this research will look only to VET system in 3 countries, they are VET System in Germany, Switzerland and South Korea.

Germany’s Dual VET system is highly recognized in the education sector. This system brings Germany to have the lowest youth unemployment rate in European countries (6.4%)¹. Therefore, many countries with high unemployment rates are beginning to look at the vocational education system implemented in Germany. However, Indonesia are more focusing on the Switzerland Vocational Education and Training System. It is mostly discussed in this research since Indonesia recently gain more assistance for our domestic education system through the Switzerland Association. By learning from Switzerland’s vocational and education system, Indonesia wants to apply an education system that combines the theoretical education in the classroom, as well as the internship practices in industry.

South Korea has ever experienced the same level of situation when they want to implement the dual vocational and education system. South Korea now has a very strong industrial economy and has come up to be a develop country before previously listed as among the poorest country in the world. Therefore, this research also trying to get some

¹ Youth unemployment rate in Europe (EU member states) as of August 2017 (seasonally adjusted). [online access on October 1st, 2017]

best practices from South Korea. How they manage the system and adapt to its industrial circumstances.

7. Structure of the Study

The next chapter will provide literature reviews about the important factors in creating the Dual VET system and how to adapt the system. In Chapter 3, we will try to look at the current system of vocational training in Indonesia including the consumer preferences, government rule and try to describe the funding, training regulation and challenges in the current Dual VET system. The Dual VET System in Germany, Switzerland, and South Korea will be described in Chapter 4. In Chapter 5, we will try to describe the best practices from existing Dual VET system of the three countries to Indonesia VET system. This chapter will also cover the information about the Association of Advanced Politekniks Indonesia (APII) as a new hope for the development of the vocational education system in Indonesia. Chapter 6 will summarize the research findings and provide policy recommendations for the government of Indonesia to shape and scale up Dual VET System for accumulating the skilled labor forces and to narrow down the skill gap in the labor market.

Chapter II

Literature Review

1. Important Factors in Creating the System

A lot of study has been done about the vocational education and training system. Bukhari's (1968) mentioned that it is important to incorporate the existing vocational school in develop a comprehensive school system. The VET system in every countries will be different to each other. In Latin America, Staley's (1971) point out that vocational training were less productive than the training centers run by national manpower training organizations. The training centers in Latin America is more flexible, less cost, and create a well-trained worker.

In Nepal, Newbry and Martin (1972) found there is problem with the skill difference. Among 161 (or 95%) of the 169 graduates, only 5 students got a suitable jobs related to their training. From this kind of situation, various countries have developed several approaches to help young people to find a working place. There are 3 different models used mostly by some countries. First, is the market-based or liberal model, commonly use in some countries which don't have any standardize vocational education system. Within this system, the market regulate the supply and demand for training. Second, the school-based or bureaucratic. In this case, vocational training is organized and financially supported by the state, and the existing vocational skills are not facilitate the labor-market

demand. The last model is the dual-corporatist model, which combines the previous 2 models. This model commonly applied in German-speaking countries. According to this model, both schools and companies used as learning function. The apprenticeship will take place through the company-based training, while the theoretical component will be provided by the vocational schools. The particular feature of this system is that the provision of knowledge and skills is closely linked to the acquisition of necessary job experience. For this reason, trainee will experience a similar condition in both training places and the workplace (Greinert, 2004).

The main challenges for Dual VET systems to develop in many countries is that companies are not used to hire and educate apprentices. Companies hesitate to invest in the education of young people. As skilled professionals are in high demand in the labor market, most of the skilled graduates are leaving the company after their graduation. Other scholars also mentioned the challenges to apply the VET system. Kadir, Nirwansyah and Bachrul (2016), listed the challenges on VET in Indonesia. Most people in Indonesia still have the negative stigmatization about the vocational schools. Other challenges vary from the funding, the quality of vocational teachers and lectures, the industry involvement for vocational education, and the inter-agency coordination. The Indonesia geographical features also become a challenge for Indonesia to provide the same level of education facilities between the cities and remote areas.

Woolway (2013) found that the arrangement are vary within each countries. This arrangement consists of several aspects such as the system of certification, the

competencies focus, apprenticeships and the ratio of time consuming between the workplace and school. Hoffman (2011) emphasizes that all of the stakeholders, such as the employers, unions, government, professional organizations, licensing programs, educational boards as well as the individual schools need to join together in creating the policy and building a legal framework to actualize the vocational system.

On the other hand, Eichhorst (2012) mentioned that based on international experiences, it is not easy to implement the dual VET system. Even though this system may seem the best system to implement in to link the education and the industry. Dual VET and VET usually only effective if it is significantly supported by major actors. For example, this system will work effectively if the employer engages in a structured and systematic training as well as up to date training curriculum. To come to this achievement, it is important to include the employers to design the training schemes, since they understand better what they need in the working place. Moreover, the vocational school could only be successful if they have accepted as a promising option to start a career.

The features in the Dual VET system also possible to be implemented in the developing countries and not only bound to developed countries. With the sufficient interest and support from the stakeholders, it is possible to establish the regional or sectoral training clusters. Once they fulfilled the support needed, it is easier to implement feasible forms of dual VET. The shared interest could be focused in a specific skilled labor force in particular relevant occupations, a large as well as foreign-owned firms in modern sectors or sectoral training schemes run by employer associations. Mutually recognize certificate

for the workers could be led by a basic agreement on training curriculum and training provision. The support from the society could also be helpful. This support could come in many important aspects, such as support for schooling phases as well as some non-bureaucratic regulation of the training elements and standards in order to acknowledge the acquired skills.

Some countries have found that it is helpful for the young people to have a smooth transition to the work field if the system able to connect the existing VET systems and the recent demands of the labor market. In particular, vocational education provided in the framework of secondary schooling should be developed and updated along the phases of practical work experience, such as internships or passing the final year with an employer. Furthermore, it is important to engage the employer to design the vocational school curriculum. Within the system, the school needs to have a well-organized correlation with any other stakeholders including the trade unions.

Vocational education often seen as the last option in the education path. In terms of avoiding the negative perception of vocational education, it is important to facilitate the transition to further education, including the tertiary education. Moreover, it is effective to have a low vocational education fees to increase the enrollment number in some countries.

2. Adapting the Dual System of Vocational Education and Training

Marco (2015) mentioned that the Dual VET systems successfully implemented in Switzerland and other European countries are treated as a common task of schools, industry and state. Thereby, the schools are taking care of the theoretical part of the education (40%), and the industry (companies hiring apprentices) is provided for the practical part (60%). The state has regulatory and financing functions. Such "tripartite" VET systems are successful models in countries practicing Dual VET, they effectively counter the skills shortage as well as youth unemployment, thus they are powerful instruments for the economic development in these countries.

The dual apprenticeship system is seen to contribute significantly to the successful economic development and strength of Switzerland and some other European countries. The dual system requires a relation between the state and the private sector characterized by mutual esteem and trust. Practical training is expensive because it requires up-to-date infrastructure, proper equipment and consumables. Depending on the trade, the costs can be substantial. Batliner (2014) point out and describe four conditions that favorably influence the dual apprenticeship scheme practiced in Switzerland, such as the manual skills are regarded as expertise to take pride in, the formal education system in Switzerland is highly decentralized, the Swiss economy is highly organized and regulated, the federal or decentralized political structure of Switzerland is based on the principle of subsidiarity, which Swiss society upholds and defends.

Where the socio-cultural conditions described above are not in place, the total implantation of the dual apprenticeship system tends to ultimately result in rejection. Even when it is possible to create an appropriate legal framework and to reach a broad consensus about the advantages and benefits of the dual system, its implementation and stabilization requires more time and endurance than usually given in development cooperation. Many of the people involved, who have never had a real life experience with the system, do not know how to transform the letters of the law into real life and training. From the perspective of the parents, it seems risky to put their children into a VET system that nobody knows. Understandably, they choose the well-trodden and therefore seemingly safer academic path for their children.

An additional difficulty is that the dual apprenticeship system of Switzerland appears to be bewilderingly complicated because the simple pattern of four days' work, one day of school only applies to a few trades. For instance, in the case of the tourism sector, time in school clustered in blocks, since all available hands are needed at work in hotels and restaurants during the high season. However, the differences are merely variations adapted to the different needs of the sectors.

Chapter III

Dual VET in Indonesia

1. Vocational Education in Indonesia

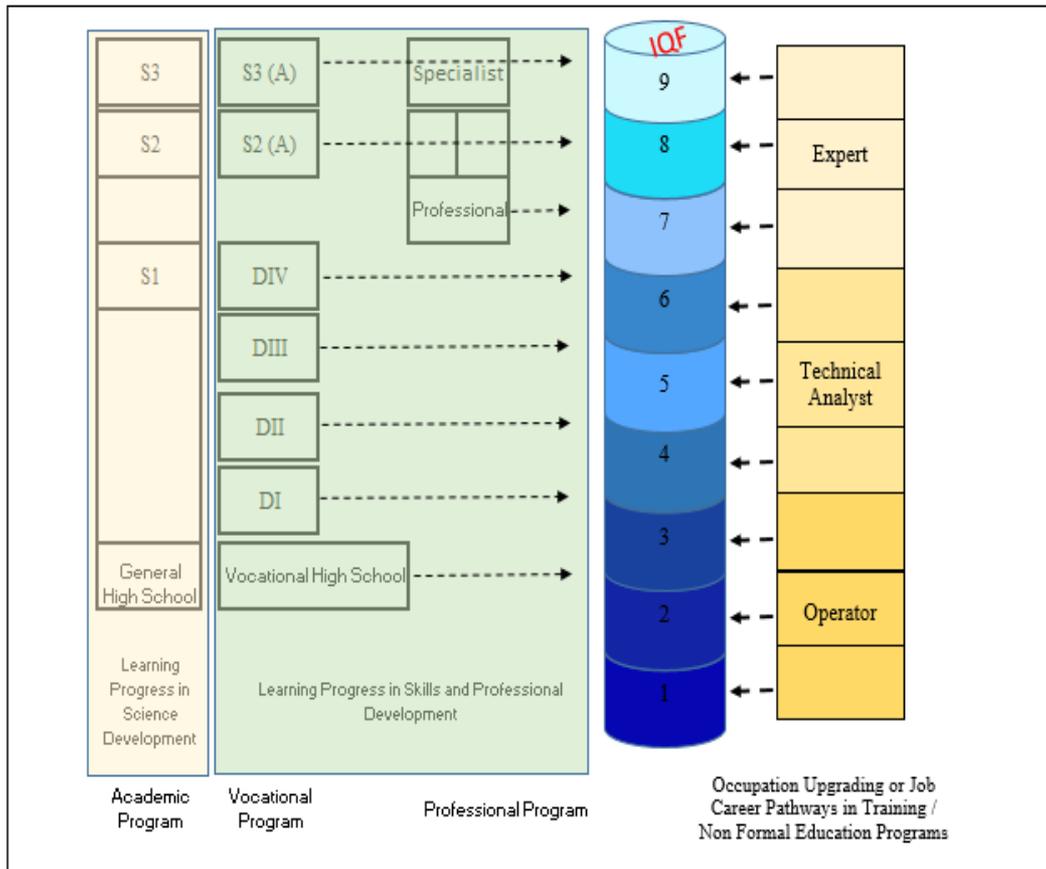
Vocational education serves to prepare students to improve the quality of life, able to develop themselves, and have the expertise and courage to open their own business. As a special education, vocational education is planned to prepare learners to enter the workforce. The learners are prepared to be a productive workforce who is capable of creating superior products that can compete in global markets. They also prepared to be professionals who have a moral quality in their vocational field. In addition, vocational education also serves to prepare students to master science and technology.

It is more than 150 years since the first vocational school build in Indonesia. The first vocational school during the Dutch colonial times in 1853, is the School of Carpentry in Surabaya (Ambacht School Van Soerabaia). It also open in Bandung, West Java, they are Ambacht School and Ambacht Leergang, which later became the School of Engineering Ciroyom. Vocational education in the colonial era oriented to the fulfillment of Dutch labor needs. After Indonesia's independence, the concept of vocational education followed the Netherland's system. The ruling of the government in the late of 1960's has put up the vocational education system to adopt models from other countries. Since then, vocational education has gradually began to get a place in the education system in Indonesia.

Indonesia adheres to unified system or integrated system. The achievement of learning for academic education, vocational or profession for the same or equivalent qualification level, even equal with the result of informal or informal education, get attention in the Indonesian Qualification Framework (IQF) or “Kerangka Kualifikasi Nasional Indonesia (KKNI)”. IQF in Indonesia is structured as a unified framework of qualifications for all sectors of education, training, and employment.

IQF states around nine levels of qualified Indonesian human resources. Qualification descriptions at each level of the framework comprehensively consider a full learning achievement, which can be generated by a formal, non-formal, informal, and independent educational process to be able to perform quality work. The description of each level of qualification is also adapted to the development of science, technology or art, as well as the development of sectors supporting the economy and people's welfare, such as industry, agriculture, health, law and other related aspects.

Figure 1. The Indonesian Qualification Framework (KKNI)



Source: DGHE (2013)

The basis of development of Indonesia's National Competency Standard was formed by the IQF. This standard includes the on-the-job requirements, knowledge, skills, expertise and work ethics relevant to perform tasks for a specific position (Kadir, Suzaina, Nirwansyah, Bachrul, 2016). This National Competency Standard at Work is the basis of vocational school to construct the curriculum.

The formulation of the National Competency Standards at Work is under the responsibilities of Ministry of Manpower. In June 2017, the MOM has issued 624 standards which cover several sectors such as agriculture, plantation, fisheries and forestry; electricity, mining and energy; manufacturing industry; transportation and communications; arts and tourism; health; finance and banking; construction; and services, consultation and trade.

The formulation of this standard is could be initiated by the stakeholders. The standards varying based on the skill demand within the same sector. This National Competency Standards could fulfill the the gap between what student learn in school and the actual skill needed in the workplace. Therefore, the curriculum development in vocational schools (SMK) and tertiary vocational institutions need to follow this standard.

The IQF has some implications for the education sector and the job market. In the education sector, an individual student allow to change the academic education track to the vocational education track without any penalty. The MOEC and the DGHE called this system as the “Multi Entry Multi Exit System” (MEES). Multi Entry Exit System (MEES) according to Noor (2016) is a flexible educational model that emphasizes flexibility of time to finish the program, place of school, cross-cutting of level, streams, and kinds of education. It implements flexibility which allows participants to determine their own time, level, and kinds of education such as non-formal or formal (general or vocational school). This system gives a chance to students who want to stop their studies in certain times and come back to school or in another school based on their needs to learn another new skill

(re-skilling). For instance, the IQF enables a general high school graduate to change their education tracks by enrolling into a vocational bachelor program (D4) instead of a general academic bachelor program (S1). Students who aim to change their education tracks yet do not fulfill the least requirement have the option of attending a matriculation program to prepare them for entering the new education track. The MEES open the possibility for the student to change their education path.

2. Consumer Preferences

There are several kind of vocational skills institution available within the country. They offer formal and non-formal education and also issue the certificates, diplomas or degrees. The institutions mentioned as follow: 1) the vocational senior secondary schools and the Islamic vocational senior secondary schools; 2) community colleges; 3) polytechnics; 4) universities; and 5) vocational centers. In this research, we will focus more on the institution which has the most enrolled students for the vocational education that is Sekolah Menengah Kejuruan (SMK).

Vocational school has been rapidly growing within the country since the last 2 decades. The enrolled student number was increased by 158% between 2001 and 2010². In 2016, Indonesia has 12.659 Vocational Senior Secondary School (VSSS) which consist of private (9.339) and public (3.320) ownership. (MOEC, 2016).

² OECD/Asian Development Bank (2015), *Education in Indonesia: Rising to the Challenge*, OECD Publishing, Paris.. pg. 140.

Table 1. Secondary School Statistic in Indonesia

Year	Number of School		Number of Student Enrolled	
	SMA*	SMK	SMA*	SMK
2002/2003	8.036	4.943	3.143.730	2.099.753
2003/2004	8.238	5.115	3.257.973	2.141.574
2004/2005	8.899	5.665	3.402.615	2.164.068
2005/2006	9.317	6.025	3.497.420	2.231.927
2006/2007	9.892	6.422	3.591.846	2.401.732
2007/2008	10.239	6.746	3.758.893	2.738.962
2008/2009	10.762	7.592	3.857.245	3.095.704
2009/2010	11.036	8.399	3.942.776	3.319.068
2010/2011	11.306	9.164	4.105.139	3.737.158
2011/2012	11.654	10.256	4.196.467	4.019.157
2012/2013	12.107	10.673	4.272.860	4.189.519
2013/2014	12.409	11.726	4.292.288	4.199.657
2014/2015	12.513	12.421	4.232.572	4.211.245
2015/2016	12.689	12.659	4.312.407	4.334.987
2016/2017	13.144	13.236	4.659.542	4.682.913

*SMA: General Senior Secondary School

** SMK: Vocational Senior Secondary School

Source: Statistics of Indonesia and MOEC (2004 - 2017)

From the table above, the number of the student is increasing every year. It is reflecting that the growing demand of people who want to learn the technical skills. This becomes the new basis of the Indonesian government to come up with the new goal that is to build on that demand. This ultimate goal could be pursued by increasing the investment and expanding the vocational schools widely across the nation.

However, although a lot of preferences and education stage provided in vocational education, there is still a negative stigma within the Indonesian society. Being enrolled in the vocational senior secondary education is seen as “academic failures”. Moreover, it has been recognized as a second option in Indonesian society.

3. Government Role

The responsibilities of vocational education and training in Indonesia vary in several ministries. Recently, five ministries involved in developing a link and match system under the MoU about the Development of Vocational Education Based on Link and Match Competency with Industry. The coverage of this MoU to the development of the VET system consists of building vocational education and competency-based vocational; restructuring the skills and curriculum programs to suit the needs of industry; developing the industrial facilitation infrastructure for work practices and or apprenticeship for students and teachers or lecturers; supporting the industry facilitation in preparing the workshops and infrastructure; improving the competence of teachers and lecturers through an apprenticeship in the industry; and increasing the quantity and quality of vocational education infrastructure. Furthermore, the MoU also stipulate the specific role of each ministry.

This MoU had been signed in the late of 2016 and stipulated the role of Ministry of Industry, Ministry of State-Owned Enterprises, Ministry of Culture and Education, Ministry of Research and Technology and Higher Education, Ministry of Manpower.

Ministry of Industry has several responsibilities such as preparing the industrial distribution map and the industrial development projection based on region/zone and industrial type, preparing the industry readiness maps that can facilitate fieldwork practices and / or apprenticeship in industry for SMK students, graduate students and teachers / lecturers of vocational education units, encouraging the industry to provide workshops as a teaching factory for vocational education and industrial vocations and to facilitate fieldwork and / or industrial apprenticeship for SMK students, graduate students and teachers / lecturers of vocational education unit, facilitating the development of competency infrastructure in industry such as SKKNI, Competency Assessor and Competency Certification Institution, establishing the regulations on the facilitation of fieldwork practices and / or apprenticeship by industrial companies, supporting the founding of a vocational education and vocational unit with a course of study / expertise in industry, and encouraging the industries to facilitate the provision of industrial infrastructure to vocational education units.

Ministry of Culture and Education has several responsibilities such as developing a vocational secondary school (SMK) distribution map by region and skill program, restructuring the skill and curriculum programs on competency-based SMK according to industry needs in each region, increasing the competence of SMK teachers/lecturers in accordance with industry needs through training and apprenticeship of industry, establishing the regulations concerning fieldwork and / or industrial apprenticeship guidelines for vocational school students, coordinating and evaluating the implementation

of fieldwork practices and / or apprenticeship of industry, facilitating the SMKs to be nurtured by industries including those supported by the Ministry of Industry, facilitating the provision of instructors from industry as mentors of fieldwork and / or apprenticeship of industry and teachers in vocational education units, and improving the quality and quantity of facilities and infrastructure in the unit of vocational education.

The Ministry of Research, Technology and Higher Education has several responsibilities such as developing a map as a unit of vocational education based on region and study program / major; restructuring the study program and vocational education unit curriculum according to industry needs in each region, increasing the competence of educational staff of vocational education units in accordance with industry needs through training and apprenticeship of industry, establishing the regulations concerning fieldwork and / or apprenticeship guidelines for vocational education unit students, coordinating and evaluating the implementation of fieldwork practices and / or apprenticeship of industry, facilitating the provision of infrastructure from industries as mentors of fieldwork and / or apprenticeship of industry and teachers in vocational education units; increasing the quality and quantity of facilities and infrastructure in the vocational education unit, accelerating the provision of vocational teachers, and developing the study programs in universities to obtain vocational teachers.

Ministry of Manpower has several responsibilities to develop the vocational and education system. First, they need to develop a national manpower requirement map by region and position qualification. Second, they need to coordinate the labor market information

system for all sectors. Third, they need to revitalize the Training Center (BLK) as a place of practice and to execute the competency test for students and vocational education and industry vocational students. Fourth, they need to facilitate fieldwork practices for students and students and apprenticeship of industry for prospective industrial workers. Fifth, they need to coordinate the acceleration of completion of competency map and Indonesian National Framework implemented by each sector. Sixth, they need to facilitate the Professional Certification Institute (*Lembaga Sertifikasi Profesi or LSP*) licensing for vocational education and competency certification through National Professional Certification Agency (*Badan Nasional Sertifikasi Profesi or BNSP*).

Ministry of State-Owned Enterprises has several responsibilities. Their responsibilities vary from preparing the distribution of state-owned manufacturing industry by region and type of business. They also need to encourage all State-Owned Enterprises (SOEs) in providing more access for the high school students, bachelor students, teachers / lecturers to undertake fieldwork and / or apprenticeship. Ministry of State-Owned Enterprises also need to encourage all state owned enterprises to provide support in the development of teaching factories and infrastructure for vocational education and industrial vocations. They also need to encourage all state owned enterprises to absorb vocational education graduates and industrial vocations in accordance with the required competencies.

4. Funding Within the System

The responsibilities of the development of Indonesia's VET system lies in many different stakeholders, which has different level of responsibilities. Therefore, it is hard to measure the exact amount of funding from each of the stakeholder. This funding generally goes for providing the financial support for VET's operational cost, infrastructure as well as salaries for the lecturers.

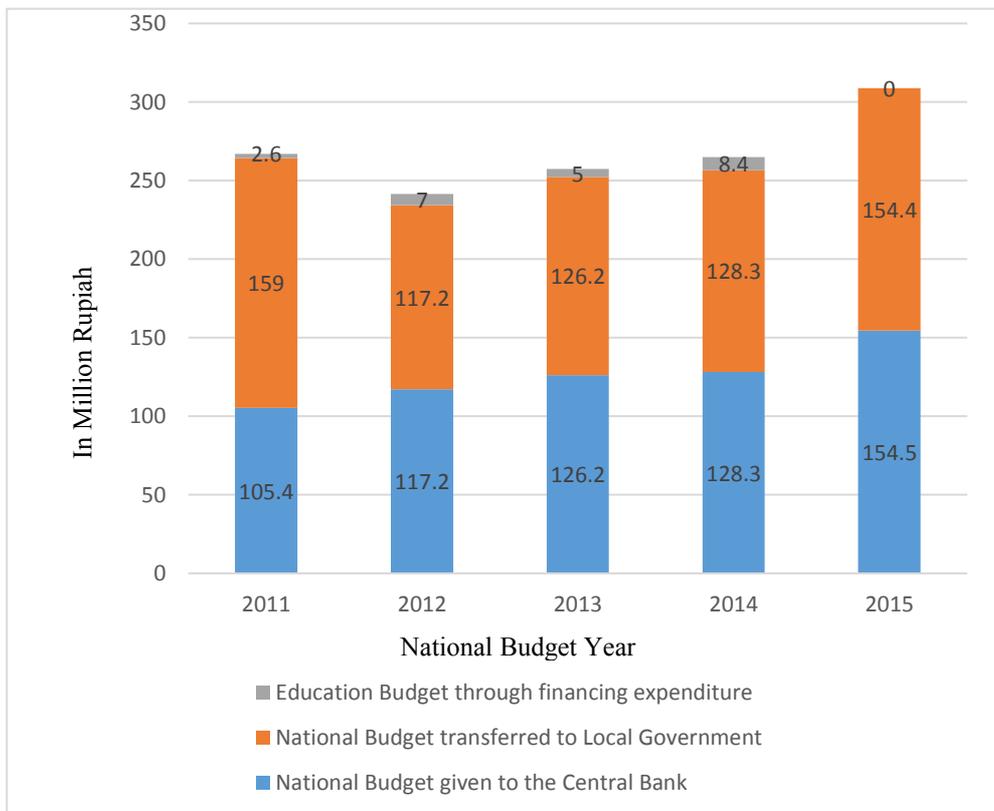
Table 2. Trend of Budget by Fiscal Year 2010-2015

Fiscal Year	Type of Budget	IDR	%	Loan	%	Total
2010	National Budget					974.819.700.000
	Educational Budget	61.193.476.630	95.87%	2.636.807.049	4.13%	63.830.283.679
	%					6.55%
2011	National Budget					1.104.902.000.000
	Educational Budget	65.140.845.053	95.53%	3.050.877.192	4.47%	68.191.722.245
	%					6.17%
2012	National Budget					1.311.400.000.000
	Educational Budget	75.074.891.185	96.49%	2.728.498.650	3.51%	77.803.389.835
	%					5.93%
2013	National Budget					1.529.673.100.000
	Educational Budget	79.481.417.164	96.96%	2.495.933.715	3.04%	81.977.350.879
	%					5.36%
2014	National Budget					1.816.700.000.000
	Educational Budget	80.957.338.010	96.66%	2.793.659.381	3.34%	83.750.997.391
	%					4.61%
2015	National Budget					1.793.588.900.000
	Educational Budget	40.919.826.155	98.81%	491.760.341	1.19%	41.411.586.496
	%					2.31%

Source: Finance and Planning Bureau, MoEC

The responsibilities for funding the basic education are under the regional government. However, the central government remains significantly involved. The effectiveness of the funding depends on the quality of the intergovernmental interactions in creating the regulations, monitoring and accountability of the result.

Figure 2. National Budget for Education Year 2011-2015



Source: MOF 2015

The regional government is responsible to pay the salaries of teachers who has public servants status. As for the non-public servants, each individual region's policy will decide

differently. In some regions, the local government takes the responsibilities for its non-public servants, while some other regions get the fund from the parents.

5. Current Situation and Challenges in the Dual VET

The distribution of vocational school in Indonesia is not equitable across the country. TVET institutions mostly located in the Java, Sumatera and Sulawesi Island. Java Island has 57% of vocational school and Sumatera Island has 21% of the total vocational schools. It will be a challenge for the government to provide vocational education evenly. Table 3 below shows the number of vocational secondary schools in major islands of Indonesia.

Table 3. Total SMK Vocational by Major Island, Academic Year 2015/2016

Major Island in Indonesia	Number of SMK Vocational
Java Island	7.274
Sumatera	2.630
Borneo	658
Sulawesi	1.054
Others	1.043

Source: MoEC 2016

In 2015, the number of workers graduated from vocational school and work in the industries was increased by 27% from 2014. This percentage was again increased in 2016, even though the number is not much.

Table 4. The number of Labor generated through Vocational Education (SMK, D1, D2, D3 & D4) in cooperation with industries.

Year	Number of Workers
2014	3.326
2015	4.229
2016	4.556

Source: MoI, 2016

The government through the ministry of industry has been boosting their activities to develop the VET system. After the enactment of the MoU of 5 Ministries and the launching of APII, MoI focusing on gathering the schools and industrial companies to be participated under the APII coordination. Their target is to meet the regional mapping which aimed to have annual certification targets of 220.134 people in 2017, 370.209 people by 2018 and 450.209 people by 2019. This number is taken from the target achievement from 2017 to 2019. The target achievement detail is (1) Graduates 1.775 SMKs of 845.000 students who will be collaborating with 355 industrial companies; (2) 162.000 participants of Training 3-in-1 (Training-Certification Competence-Placement); (3) 15.552 graduates from the regular educational programs of the Ministry of Industry and (4) Certification of Industrial Workers Competencies totaling up to 18.000 persons. Thus, the target number of certified industrial workers 2019 will reach 1.040.552 people (MOI, 2016).

In 2017, the government has initially launched the link and match program and participated by numbers of SMKs and companies. The launch of the program is done in stages. In February 2017 was conducted in East Java and participated by 49 companies

and 214 SMK. In April 2017 was conducted in Central Java and participated by 120 companies and 356 SMK. In July 2017 was conducted in West Java and participated by 140 companies and 372 SMK. In September 2017 was conducted in North Sumatera and South Sumatera and participated by 104 companies and 224 SMK. Until 2016, the number of the workforce trained are 11.622 workers. Meanwhile the number of labor generated through vocational education in 2016 are 4.556.

The vocational school (SMK) is considered as one of the middle-level education which could provide skills required in the job market. However, the students are often not provided by sufficient hands-on learning to develop practical skills relevant to future jobs, technical know-how, adaptability to change and interpersonal skills. Mostly, the teachers who trained these students have less practical experiences in the modern workplace. The result is that a lot of number of SMK graduates can't be absorbed in the business world or industry. From 7.56 million total unemployment, there are 20.76% of them are graduated from SMK (BPS, 2015).

The vocational school in Indonesia demanded the revamping of the SMKs, especially to prepare the graduates to be ready to compete in national and international markets. This problem is shown in the WEF Report 2016 which stated that the labor market efficiency in Indonesia fell to rank 108 among 138 countries. (WEF Report, 2016).

The current system of supply-driven provision of TVET is fragmented among several ministries and the private sector. This has resulted in duplication of effort, gaps in service provision, less efficient financing concept and policy inconsistencies which can give the

negative implications to the students. Therefore, it is essential for Indonesia to make the system more industry driven and improve the co-ordination among stakeholders.

Another situation happened within the society is the stigma of technical and vocational education which consider the vocational education as a second-best option for those who are not performing well in the general education system. This could be another challenges for the government to increase the enrollment number in vocational schools. Indonesia's new target is to increase the ratio of students enrolled in SMK / vocational schools to 60% by 2020. Even though the enrolment number in SMKs are increasing recently, the graduates of junior secondary school put more interest to enter the SMAs. The Indonesia's *Country Background Report* (2014) mentioned that this phenomena happen due to the lack of information about the potential job opportunities offered in their programs. Therefore, the counselling facilities holds an important role to promote the vocational education among the students.

The other challenge also occur in the curriculum. There are two main challenges in connecting the curriculum to the skill demand in the industry (MOEC, 2012)³. First, the leader or the principal of the vocational school need to have a sufficient knowledge and experience of the current workplace. With this capabilities, they are able to enhance the learning of their student and use their networks to develop private public partnerships. Another challenge is how the MOEC and MORA could grant the necessary autonomy and incentives for SMKs to interact with businesses as well as ensuring that the regulatory

³ OECD/Asian Development Bank (2015), *Education in Indonesia: Rising to the Challenge*, OECD Publishing, Paris.

framework will not change the school's focus on learning rather than only providing a cheap source of labor. It is a challenge for the government to increase participation in senior secondary education and accelerate the share of vocational education participation in the economic development.

Chapter IV

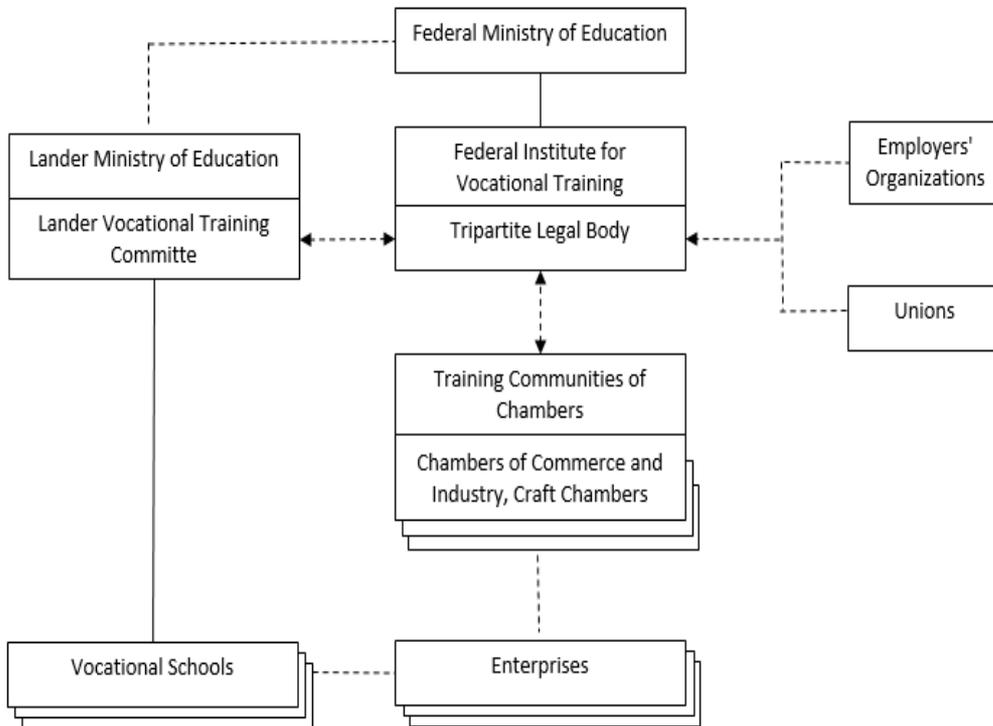
Vocational School in Some Countries

1. Vocational School in Germany

The Germany's Dual VET system highly recognized. This system brings Germany to have the lowest youth unemployment rate in European countries (6.4%)⁴. Germany vocational schools along with the in-company training as a part of the dual system are the responsibilities of The Federal Ministry of Education and Research (BMBF). Individual qualifications are authorized by specialized ministries (usually the Federal Ministry for Economic Affairs and Technology (BMWi)) under the agreement from the BMBF. To understand the structure of the Germany Dual VET system, figure 3 below show the link between the actors in Germany system.

⁴ Youth unemployment rate in Europe (EU member states) as of August 2017. [online access on October 1st, 2017] <https://www.statista.com/statistics/266228/youth-unemployment-rate-in-eu-countries/>

Figure 3. Coordination Structure in the Dual Training System.



Source: Managing Vocational Training Systems - A Handbook for Senior Administrators (ILO, 2000)

Unlike the full-time VET schools which require a lower secondary diploma, it only requires the students to complete their compulsory education before their join the senior vocational school. Its not taking a long time after they join the company, the apprentice can earns a salary which increases in year basis. Commonly, the amount is one third from their starting wage as a skilled worker.

In the dual system, it is important for employer or companies to provide the comprehensive training for the students. However, not all companies in Germany can afford this training. Therefore, the government create a way for this small companies. The small companies are able to join together with other firms and create a training alliances (Ausbildungsverbände). The practical training is complemented by teaching in part-time VET schools where students spend 12 hours every week. “In the part-time schools students receive one third general education and two thirds occupationally-specific education according to a framework curriculum issued for each profession by the Standing Conference of Ministers for Education and Cultural Affairs (Kultusministerkonferenz, KMK) for vocational subjects and by the Länder for general subjects.”⁵ Both if the KMK and the Länder participate in creating the vocational school curriculum.

In Germany’s system, they have 2 different types of vocational education and training teachers. The first is for the theoretical subjects and the other one is for practical training. Teachers of theoretical subjects need to hold a university qualification background including instruction in teaching practice, while the teachers for practical training don’t have to hold a diploma from higher education. However, commonly the teachers for practical training have a specific background based on their relevant skill or occupation.

The responsibility for the part-time as well as the full-time VET schools belong to the Länder. This responsibilities including several activities such as designing the school curriculum. As for the training and paying the teachers, it will be the responsibilities of the

⁵ Hoeckel, Kathrin and Robert Schwartz. September, 2010. OECD Reviews of Vocational Education and Training: A Learning for Jobs Review of Germany.

legal supervision of the Chambers. Due to this primary responsibility of the Länder for cultural and educational matters there is substantial variation across states regarding the organization and content of teaching in their dual system.

The social partners commonly engaged in the design and provision of VET, such as developing and updating of the ordinances (formally issued by the Ministry of Economic Affairs and Technology) as well as determining apprenticeship salaries through collective wage negotiations. On the other hand, the Economic Chambers taking the responsibilities for providing advisory services for the participating companies and supervising the company-based training. The Chambers also register apprenticeship contracts, assess the suitability of training firms and monitor their training, assess the aptitude of VET trainers, provide advice to training firms and apprentices, and organize and carry out the final exams. The key success factor of the German dual apprenticeship system is the close partnership among all social partners. And the dual VET-system is strongly integrated into the German economy and society.

The decisions on the financing of education are taken at all three levels (Federation, Länder and local authorities). However, over 90% of public expenditure are provided by the Länder and the local authorities⁶. Mainly they are the Länder covering for the teacher salaries, as for the equipment and infrastructure, it will be covered by the local authorities. In Germany's system, the companies taking responsibilities to finance the training cost in the workplace. "For some sectors, companies have created a general fund to which all

⁶ The Education System in the Federal Republic of Germany 2014/2015.

companies pay contributions and through which the costs for the apprenticeship institution are covered, while in other sectors each company bears its own costs.”⁷ The whole VET system in Germany is already have the strong financial support. Both of public and private stakeholders aware to their responsibilities in funding this system.

The VET system in Germany has a well-developed. This could be seen by the existence of several institutionalized VET research capacity, including the Federal Institute for VET, *BIBB*, and a national network of research centers to find out more about the various aspects of VET system. It is very important to have such institutions which can be useful to have the sustainability of improvement and innovation in the VET system. Even though there are a strong collaboration among the public and private stakeholders, the Germany’s Dual VET system also characterized by an intricate web of checks and balances at the national, state, municipal, and company levels which ensures that the national educational and economic goals will not be distorted by the short-term needs of employers.

2. Vocational School in Switzerland

VET programs in Switzerland usually held at several different school and training places. VET students spend the time in a vocational school as well as in the host company for the apprenticeship. Mostly, VET students attend the industry courses at an industry training center to increase their complementary practical skills. The match of apprenticeship demand and supply will be monitored in the “apprenticeship barometer”. This barometer

⁷ Hoeckel, Kathrin and Robert Schwartz. September, 2010. OECD Reviews of Vocational Education and Training: A Learning for Jobs Review of Germany.

are created based on a written business survey and it carried out every 6 months. This barometer also conducting a telephone survey of young people between the ages of 14 and 20.

The Swiss Federal Institute for Vocational Education and Training (SFIVET) as a tertiary level institution provides the basic and continuous training to the vocational teachers, trainers, examiners and professional college teachers. This institution also offers an MSc degree in VET for those involved in the management of Switzerland's VET/PET system. With an organized structure, it is easy for Switzerland to recruit and sustaining a good quality supply of vocational teachers and trainers.

The funding of Switzerland's upper-secondary level VET programs is shared among the public and private sector. It is shown about 45% of VET costs were coming from the private sector in 2006. However, for the public funding, the responsibilities going to the Confederation (25%) and the cantons (75%). The funding of Switzerland's tertiary-level PET program and CET courses are primarily the responsibility the employers and the private individuals involved.

Switzerland has implemented a systematic system for the student in helping them to pursue their professional carrier through providing the career guidance and counselling. It is mandatory for secondary education pupils to join the career guidance and information sessions to enhance their information about higher education level and career options.

To support this activities, all teachers will be given several training to broaden their knowledge about the labor market. In the lower secondary schools, students are introduced

to the centers for occupational information (*Berufsinformationszentren, BIZ*), which is the primary institutions for career guidance and counselling. BIZ is not attached to any individual institution, rather it is an independent institution that provide any information and counselling for all levels within the VET system. Since BIZ is not attached to any of individual institutions, BIZ able to facilitate any unbiased information and advisory about the future career and opportunities for students.

For the VET students who wish to continue their study into several institutions such as Swiss university of applied sciences or a Swiss cantonal university, federal institute of technology or university of teacher education, the Federal Vocational Baccalaureate (FVB) exist as an optional general education qualification. “The FVB can be obtained either by attending general education courses while enrolled in a VET program (upper-secondary level), in three to four semesters while working, or by attending a one-year full-time preparatory course for the FVB Examination after graduating from the VET program.”⁸ The FVB was introduced in 1994, since then the number of VET students who obtained the FVB has increased constantly.

There are 3 main actors responsible for the Switzerland’s VET/PET system, they are the Confederation, the cantons and professional organizations. This collaborative partnership among the 3 actors was arrange and stipulated by law. Within the system, Confederation (through the Federal Office for Professional Education and Technology (OPET)) responsible for the quality and strategic planning and development of VET/PET programs.

⁸ Hoeckel, Kathrin, Simon Field and W. Norton Grubb. April, 2009. OECD Reviews of Vocational Education and Training: A Learning for Jobs Review of Korea. 2009 Vocational Education in Switzerland.

The Confederation will issue more than 250 VET ordinances and recognizes the 400 tertiary B PET programs. They will also ensure the compatibility of the system across the country. Meanwhile, the cantonal VET/PET agencies (under the coordination of the Swiss Conference of VET/PET Agencies, *Schweizerische Berufsbildungsämter-Konferenz (SBBK)*) will be responsible for the implementation and supervisory activities of the VET/PET program. They are 26 cantons in total and they are responsible for vocational schools, provide career guidance and inspect host companies and industry training centers. The third main actor is the professional organizations which include the employer, trade unions and trade associations. This organization has the responsibilities to establish the course content and to develop qualifications and exams. They also hold an important role such as offering the apprenticeship places.

3. Vocational School in South Korea

Korea's education system facilitates a 6 years enrollment in elementary schools, 3 years in middle schools, 3 years in high schools (secondary education) and further years in higher education institutions. As for the vocational level, it starts from the senior secondary level. Once the student graduated from the middle school, they are given the option to go either in general high schools or vocational high schools to pursue a higher level of education. The general high schools open the opportunity for the students pursuing a higher education institutions, while vocational high schools will train the students to perform their skills in the work field.

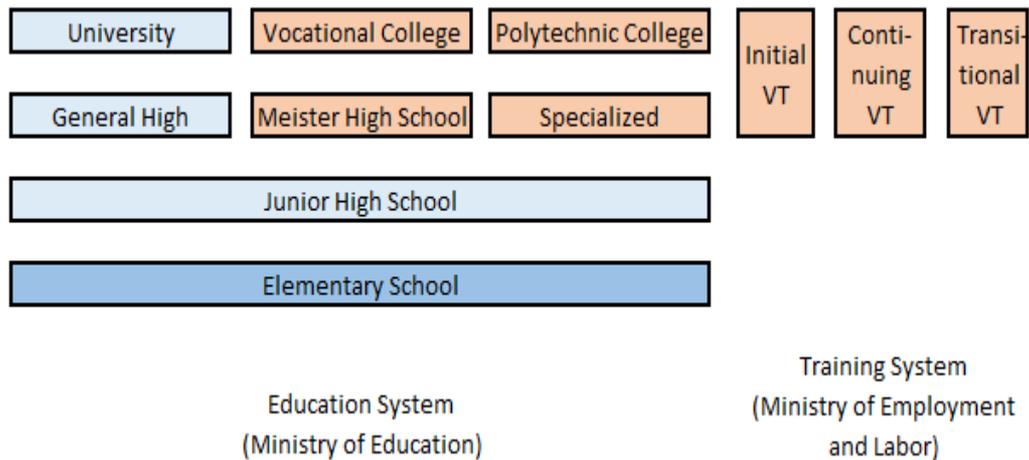
There are several fields that are offered by vocational high school in South Korea's education system. The fields vary from agriculture, technology/engineering, commerce/business, maritime/fishery, and home economics⁹. Essentially, in the first year of high school, the student will be given the common national curriculum. When entering the second and third years, they will be given a different curriculum. In this level, the VET students will have fewer hours in general subjects and need to sit for courses which are relevant to their area of expertise.

The responsibility for VET in South Korea is shared by different ministries. "Ministry of Education, Science and Technology (MEST) put more focus on pre-employment education, medium-level technician training, and technical training."¹⁰ MEST is responsible for VET in high schools and other education institutions at tertiary level (excluding polytechnics). The other ministerial level in Korea's VET system is the Ministry of Labor (MOEL) which has a responsibility for providing the training related to the labor market and polytechnics.

⁹ Kuczera, Małgorzata, Viktória Kis and Greg Wurzburg. May, 2009. OECD Reviews of Vocational Education and Training: A Learning for Jobs Review of Korea. 2009 Vocational Education in Korea.

¹⁰ Ibid.

Figure 4. Education and Training System in South Korea



Source: Lee (2014)

Lee (2014) mentioned some features of the VET system in Korea, such as the high priority over education among the Korean society, less integration between the vocational education and vocational training, the existing education and training systems are commonly coordinated by the government, the VET system doesn't facilitate the student with the work-in-place training, and the last feature is that the need of improvement quality for the workplace training.

As for the curriculum, the individual VET high school is possible to develop their own curriculum by following the guidelines from MEST and the metropolitan and provincial offices of education¹¹. For the general content of the programs such as courses in mathematics and Korean language, the guidelines are relatively strict. However, the

¹¹ Kuczera, Małgorzata, Viktória Kis and Greg Wurzburg. May, 2009. OECD Reviews of Vocational Education and Training: A Learning for Jobs Review of Korea. 2009 Vocational Education in Korea.

vocational content could be adjusted according to each high school's program. Employers will not be involved in creating these guidelines. Instead, they may give their opinion and adjusting the VET content according to their needs with the individual institutions. Through this typical system, Korea could be able to link the school and industry.

In the Korean VET system, schools which perform a high-quality of vocational education will be appointed by the government as Meister high schools (MHS). A unique features of MHS is that they organize an agreement with some specific industries regarding how to link the school curriculum to the industrial needs. The graduate student from specialized high schools was offered an option to choose between getting a job or going to college, meanwhile the MHS graduates are required to get a job. "Employment First, College Later" become the main concept of the MHS policy. With this kind of concept, they are able to balance the demand and supply of manpower.

The selection of MHS schools among specialized high schools will be the responsibilities of ministries and government departments. They need to decide which strategic industries and areas need the intensive national support for development. As for the local industries, the local administrator in charge in education will give recommendation of which specialized high schools fit for being chosen as MHS. They need to consider several aspects such as the level of strategic local industries, suitability of majors, and basic school conditions¹². After selecting the candidates of MHS, the final decision will be decided by the Ministry of Education.

¹² Ji-Yeon, Lee. *Vocational Education and Training in Korea: Achieving the Enhancement of National Competitiveness*. KRIVET, 2014.

Chapter V

Evolution of Dual VET System in Indonesia

1. Lesson Learned from International Experiences

Industry involvement in VET system depends on the structure of each industrial sector. For some countries like Sweden, Norway and the UK, certain goods such as electrics and mechanics are organized and the production activities are often engaged with training. From South Korea experiences, even though tradition have a strong influence in determine the national agreements, it can be modified or reinforced by a well-design policy. A strong VET systems country, which have a strong national structure of their strategic industries, commonly have a strong collaboration among its regional, sectoral and any other functional decision maker in the education system.

Even though South Korea has some certain features that make their VET system works in their country, the employers as one of the VET system stakeholder only given limited access in the VET system. This could happen due to the lack of systematic means on whether the VET curriculum has reflected the National Technical Qualification (NTQ) requirements. The limited access of the employers also occur due to the poor quality assurance mechanisms within the system. It was found mostly junior colleges and polytechnics. A strong quality assurance mechanism is important in the VET system to ensure that the students have obtained a sufficient set of skills after completing a degree.

In the VET system, if there are different type responsibilities between the Ministry of Labor and Ministry of Education, it is difficult to attain a sufficient concern for the labor market. In South Korea, as mentioned in the previous chapter, MEST mostly responsible for the education and training in learning institution while the MOEL has the responsibilities for training in the labor market and polytechnics. In this case, the problems could be taken place in the licensing exams and the appearance of the parallel system of degree.

Korean society known for their high esteem of academic knowledge. Therefore, in spite trying to match their vocational institutions to its industry, the vocational institution tends to consider themselves as a part of academic purpose. They were organized to complete their mission to transfer the theoretical education to their students. With this situation as well, the industry have a limited access to engaged and influence the vocational education system. In the long term, it makes the industrial sectors put less interest in school-industry initiatives.

Unlike the South Korea's VET system, Germany's approach has a stronger connection among the stakeholders of its VET system. Their system are very effective and has been emulated by some other countries. The main features in their system is the complementarity between school and work-based learning. The schools are taking the theoretical part of the education, while the workplaces are taking the more practical learning activities. This feature is supported by mutual activities. The theory taught in the class was equipped with a well-rounded approach to practical problems, while the theory's

application as well as the recent industrial activities shown in the workplaces. With a regular basis involvement in both places, such mutual reinforcement could work optimally among the students.

This kind of engagement between the employer and the education institution will demand a commitment from the industrial sector as one of the stakeholder to join the apprenticeship system. They will not only run the apprenticeship activities, but also engage in creating the curriculum, supervising the provision of workplace training, and devising the assessment regime for apprenticeship qualifications. “This framework therefore ensures not only a strong pedagogical approach in the integration of school and workplace learning, but also the institutional structure which supports employer offers of workplace training and recognition of qualifications.”¹³

The development of vocational education in Germany has several principles. First was shown by the government cooperation with industry. In this case, the government and industry are responsible for drafting and designing vocational training and training frameworks. The Federal Ministry of Economics and Energy together with the German State Government (Bundeslaender) organizes the training development framework and the rules necessary for the implementation of vocational training within a framework. Control over the course of the training was delegated from the government to an agency called Industrie- und Handelskammer (German Chamber of Commerce and Industry).

¹³ Hoeckel, Kathrin and Robert Schwartz. September, 2010. OECD Reviews of Vocational Education and Training: A Learning for Jobs Review of Germany.

The second principle, is about applying the national standard. Leubner claims that the quality of vocational school education is ensured by the application of educational standards and is adhered to nationally as a reference process. The third principle deals with the qualifications of vocational education personnel. Vocational educators must master and understand the concept of Vocational Pedagogy (Berufspädagogik).

The fourth principle is the availability of research institutions. Vocational education and career consulting Research involves governments, economic actors (in this case business and industry) and other social elements. The result encourages such vocational education to know what is developing in the industrial world, and that the needs of the industrial world or the business world towards the competencies of vocational education graduates can be identified early.

The Switzerland vocational education and training has some important features in applying the VET system. In the industrial field, the VET students need to have a basic knowledge about their work field activities. Therefore, the system appoint a senior colleague or a vocational trainer to provide some assistance to the students at the host company. The student could integrate into the production process and generate productive value even from when their start the apprenticeship period. Such systematic system, will encourage the employers to open more apprenticeship program for the vocational schools.

The vocational competencies / qualifications need to be incorporated with the trade unions rather than individual companies which might be put their company-specific training. Moreover, the SMEs in Switzerland is well represented through their trade associations.

This condition will help the SME to ensure that training given to the student will represent the needs of all types of employers instead of some major employers. This kind of system reinforced by the assessments that students must pass to get their Federal VET Diploma. This assessment will be established nationally by the professional organizations which the examiners are trained by a national agency (SFIVET) rather than some expert from major employers.

From the above description of the TVET system in several countries. Some of them can be adopted by Indonesia's TVET system to maximize the Dual Vocational Education and Training System in which the government is cultivated recently. The following table described some features that can be adopted by Indonesia's government.

Table 5. Features that can be adopted from Switzerland, Germany and South Korea

Countries and Features	Application in Indonesia
Switzerland: Apprenticeship Barometer	The current Vocational Education and Training system still lack of providing a comprehensive information about the vocational school information. The Central Agency on Statistics and Ministry of Education and Culture are the two main sources of providing the database about the school number, student number. However, the information is not integrated with the industrial sector. And were not divided based on sector, skills assessment as well as the supply and demand for the industrial activities.
Switzerland: Funding was shared between the public and private sources.	Indonesia's funding for the education sector mainly authorized by the Ministry of Education and Culture. Some of the funding also distributed to the regional government. However, the participation from the private sector is not a mandatory. Each school has their own way to get the support from the private sector. The new concept of APIII trying to bridge this gap and link the school and the private sector. So the funding can be share among the 2 parties. The government for the education and infrastructure and the companies for the training and apprenticeships.
Switzerland: Implement a systematic and professional system of counselling and career guidance.	The systematic career guidance and counselling service could be beneficial for the student to enhance their information about their capabilities and their interest. In Switzerland, the career guidance and counselling are coordinated under the regional (cantons) authorities. Meanwhile in Indonesia, the counselling is mandatory to be provided in senior secondary school. It is important to put more attention to the career paths within the occupations to which the program is designed to lead. Therefore, the element of the VET system should include opportunities for self-employment and entrepreneurship. Some of this can be integrated into the mainstream program while some might be provided as a separate element within the program.

<p>Switzerland: Well-resourced and able to provide up-to-date equipment for the training.</p>	<p>The collaboration between the government and school with the private companies under the APII was hoped to bring such progress like what has been existing in the Switzerland VET system. The up-to-date equipment could be learned by the students through the apprenticeship in order to catch up with the technology development.</p>
<p>South Korea: Education is highly valued in Korean society.</p>	<p>Many people in Indonesia still believe that vocational school as a second best option of education. The society in Korea valued the education very high as the young generation competition is very strong. Indonesia could learn from South Korea and eager to learn any knowledge based on their skills and capabilities.</p> <p>A 15 year-olds student in South Korea already have a proper education and well known about what they want and their interest. So they can be more focused on their interest.</p>
<p>South Korea: Ministry of Labor (MOEL) has responsibility for training in the labor market and polytechnics</p>	<p>Ministry of Manpower in Indonesia also participated to develop the VET system. The Ministry of Manpower hold a very important responsibilities as described in the MoU of the five ministries.</p> <p>First, they need to develop a national manpower requirement map by region and position qualification. Second, they need to coordinate the labor market information system for all sectors. Third, they need to revitalize the Training Center (BLK) as a place of practice and to execute the competency test for students and vocational education and industry vocational students. Fourth, they need to facilitate fieldwork practices for students and students and apprenticeship of industry for prospective industrial workers. Fifth, they need to coordinate the acceleration of completion of competency map and Indonesian National Framework implemented by each sector. Sixth, they need to facilitate the Professional Certification Institute (<i>Lembaga Sertifikasi Profesi or LSP</i>) licensing for vocational education and competency certification through National Professional Certification Agency (<i>Badan Nasional Sertifikasi Profesi or BNSP</i>)</p>

South Korea: The tertiary VET sector is well developed and bring more interest for the student who wants to pursue a higher education.	Not only the senior secondary school is developed, but Indonesia could also develop the tertiary VET institutions. This level of education could open the opportunities for the student not only to be employed in the companies, but also to open their own business.
South Korea: Meister High School Concept (“Employment First, College Later System”)	This system is somehow pretty similar to the Vocational Education with link and match system which will be implemented in Indonesia. This system could be the best practices for Indonesia in focusing on its strategic industries. MHS is focusing on Korea’s strategic industries which will support their national development.
Germany: The system has institutionalized VET research capacity.	Indonesia is trying to have a sustainable support to the vocational system through the APII.
Germany: High degree of engagement and ownership among the VET stakeholders.	Through the APII, the government try to gather the companies and school to participate in the development of vocational education.
Germany: Small companies has opportunity to form training alliances to facilitate the training funding.	Indonesia need to take into account for this approach. The effectiveness and efficiency to have a good human resources is very important for the company. No matter how small the companies, they need to survive in the era of liberalization.
Germany: The Länder given the authority for the part-time and the full-time VET schools.	The local government could actively participated in creating the curriculum for the school based on its industry and natural resources in their regional territory.

Some the features from Germany, Switzerland and South Korea as described above could be apply under the circumstances of the APII. In the next session, we will describe more about the new APII and its function.

2. A New Chance within the Association of Advanced Politekniks

Indonesia (APII)

The Government of Indonesia is currently launching a revitalization of vocational schools to medium-level vocational institutions whose graduates are able to compete and fill the needs of the workforce. On that basis, the government issued a strategic policy by issuing Presidential Instruction No. 9 of 2016 which contents concerning the upgrading of education and training system in SMK from upstream to downstream so that the graduates are expected to be ready to become a reliable workforce.

The central government has assigned its ministers to work together across ministries in searching for problems in SMK and then looking for a solution. There are six tasks that have been successfully formulated to improve the vocational school to be competitive, those task include making a roadmap for SMK development, perfecting and aligning the SMK curriculum with competencies according to the needs of the graduates (link and match), increasing the number and competence for educators and SMK teachers, cooperating with Ministries or Institutions, Local Governments and Business or Industrial Worlds, increasing the access to certification of SMK graduates and SMK accreditation, and establishing SMK Vocational Working Group.

Indonesia cannot sufficiently benefit from the abundance of young productive-aged workforce, because many school graduates do not possess the skills required in the economy. Indonesia may well find it difficult to cutback unemployment without taking rather deep reforms in the current vocational education system towards matching with the

actual needs of the industry. A major cause of this core problem is that the industry is not yet part of vocational education. Dual vocational education systems as successfully implemented in Switzerland and other European countries (D, A, DK, Benelux) are treating dual VET as common task of school, industry and state. Thereby, the school are taking care of the theoretical part of the education (40%), and the industry (companies hiring apprentices) is providing for the practical part (60%).

Presidential Decree Number 9, 2016 regarding the revitalization of vocational high school provides a strong basis for the Ministry of Industry to: (1) to set development projections, professions, competences (job title), and industrial sites for establishment for vocational high school and its graduates; (2) improve cooperation with the business community to provide broader access to do practical fieldwork for vocational high school students and internship programs for vocational high school teachers; (3) encourage the industry to support development of teaching factories and infrastructures; (4) accelerate completion of Indonesia's national competency standard.

To respond to the above-mentioned challenges, four leading Politekniks of Java (ATMI Solo/Surakarta, ATMI Cikarang, Polman ASTRA and Polman Bandung) have established "APII", the Association of Politekniks and Industry Indonesia. APII is an Indonesian Association of Politekniks and Industry Members in the field of vocational education and training (VET) with a priority on technical professions¹⁴. APII is a formally registered

¹⁴ APII-Association of Politekniks and Industry Indonesia. 2017. <https://www.apii-edu.org/> accessed on October 1st, 2017.

industry and school platform aiming at the involvement of the industry in the vocational education in Indonesia with industry as association members.

The purpose of APII is to gradually involving the industry in vocational education, and eventually to make the industry as a driver (model of dual vocational education as successfully practiced in Switzerland and other European states). The strategy of APII to achieve this goal is to start involving the industry in vocational education by developing industrial courses to be provided by the APII to its industry members, in the field of maintenance engineering, maintenance management, aircraft maintenance repair and overhaul (MRO), product training for industry, etc. In a common effort, polytechnic and industry prepare and provide for education services which are urgently needed by the industry.

In the long run, APII provides a series of services to the participating polytechnic and industry (i.e. technical industry course program, internship program, apprenticeship program, school development program etc.) on a commercial basis, which ultimately constitutes the income generation for the platform and its sustainability. A business plan has already been developed and serves as guideline towards sustainability.

To run the activities, the APII will count on their initial and annual membership fees. The fees is vary for the each actors involved. It is estimated to be IDR 5.00 mio (\pm \$ 350) for Politekniks and new industries' members (1919/20), IDR 20.00 mio. (\pm \$ 1500) for global companies and IDR 10.00 mio. (\pm \$ 700) for SME's. The exact membership fees will be decided upon by the AAPI General Assembly. Potentially, they could also turn out

to be considerably higher than estimated for calculation purposes in the present planning document. According to the fees and number of AAPI Members estimated, the fee income of AAPI amounts from IDR 80 mio. (tCHF 6) in 2015/16 to IDR 578 mio. (tCHF 36) in 2020.

Objectives of the APII mandate to monitor the successful implementation of the match and link program

In view to ensure that the link and match program between vocational school and industry, launched by the Ministry of Industry on 28 February 2017, will be successfully implemented, APII will monitor and guide the effective collaboration among vocational school and industry and to ultimately ensure, that the expected impact of the link and match program will be achieved.

Scope of APII in the link and match program

As APII is a network organization of vocational school and industry in Indonesia, APII has the necessary capacities to monitor and guide the implementation of the link and match program. In line with its mission and vision, APII will provide support to improve the cooperation with the business community to provide broader access to do practical fieldwork for vocational high school student and internship programs for vocational high school teacher; and to encourage the industry to support development of teaching factories

and infrastructures. For the realization of the link and match program and to strengthen vocational education in Indonesia, APII will realize the following activities:

1. Development and implementation of industrial course programs based on the actual needs of the industry;
2. Design and implementation of specific "school development programs" in close collaboration with the APII school network in Switzerland and Germany;
3. Development of appropriate framework agreements with industry and vocational school for internship programs for both students and teachers;
4. Development of a systematic framework for the realization of Apprenticeship Programs to be organized with selected employer companies and Polytechnics, based on the experience gained through the Internship Programs, and comparable to Swiss/European Dual VET apprenticeship systems;
5. Organize a systematic and effective exchange among vocational school and industry;
6. Organize for a particular school development support: curriculum development, instructor trainings, school management support, diploma certification, quality assessment, best practice award, etc.

With the enactment of APII, it is expected that the industry and vocational school will effectively implement the link and match program. Along with this, a demand and practical orientated vocational education is established due to the institutionalized

collaboration among polytechnic and industry and ultimately, providing effective avenues to reduce the high youth unemployment and skills shortage in the country.

Chapter VI

Conclusion and Recommendation

1. Conclusion

The effectiveness of VET systems in each country is an important factor to achieve a successful economy. It can serve to encourage and increase the value of the nation in the global market. This principle mentioned that any education and training system should be adjusted to a reliable labor and trade market information.

The previous vocational education and training system is not able to support the demand of workforce in the industry. The government now trying to look at the Dual Vocational Education and Training System with the APII as the platform to connect the industry and the school.

To run the Dual VET system, it need a contribution and participation from a lot of different actors. They need to support each other under their circumstances and responsibilities. Since the existing vocational schools were unable to place their graduates, it is necessary to develop a systematic school system by collaborating with the existing vocational schools.

Strategies are needed in the process of education and training in vocational schools that lead to the formation of mental and strong character and ready to face challenges and global competition. The strategy starts from the preparation, the process to the evaluation

of classroom learning that leads to the characteristics and attitudes of independence, responsibility, and honesty in learning.

APII has been established to strengthen the vocational education and training system in Indonesia. During the implementation, there are some useful features that can be taken from the countries like Switzerland, Germany and South Korea to maximize its system.

2. Policy Recommendation

The cooperation between the authorities and representatives of industrial sector as well as the trade unions to establish apprenticeship training is an important factor to achieve the reform of the VET system. Therefore, Indonesia is now taking steps to collect as many schools and companies as possible to work together to enhance the participation among the stakeholders.

Indonesia has been doing a lot of bilateral, regional and multilateral agreement to attract the investors. Indonesia included the educational clause, particularly about the dual vocational education as part of the negotiation. In 2016, during the Indonesia Australia Comprehensive Economic Partnership Agreement (IA-CEPA) negotiations, Indonesia included a clause about the importance of conducting training/education programs to increase competency in the acceleration of industrial and technological development. In 2013, the proposal of Indonesia-Korea Industrial Technology Cooperation mentioned that Korea willing to provide a short term and long term training program on industrial

technology. Among the ASEAN countries, Indonesia is participating in sharing the information about how to develop the vocational education and training. A lot of information given by those who are went for studying and working in developed countries. Valuable inputs are provided by numerous alumni who have already received training with German support and who are now disseminating what they have learned. This kind of platform could bring various opportunities for Indonesian vocational system. Moreover, the TVET Institution in some countries within ASEAN region such as Malaysia, Singapore and Thailand that used to receive support from the German development cooperation had enjoy great regional and international recognition.

To enhance the vocational link and match program, one of the government plan is through the establishing of new 14 industrial estates outside Java Island. Previously Indonesia already has 78 industrial estates. The objective is to support the creation of new economic centers throughout the region. The development of these industrial areas needs to be accompanied by management, supporting infrastructure, and adequate manpower. Moreover, the development of industrial estate should also be facilitate with the development of polytechnic or vocational school, for the provision of skilled human resources according to industry needs. On the other hand, through the development of the industrial estates, the vocational school also gains some advantages. The apprenticeship program, which is one of the main feature of Dual Vocational Education and Training system, could be well established between the schools and the companies. The focus of the vocational school is planned to follow the core business of each industrial estates in their location.

Another recommendation might come from the acknowledgement of the new responsibilities under the MoU of 5 Ministries as mentioned in chapter III. Now that each Ministry has already aware of their responsibilities in terms of developing the Dual VET system in Indonesia, it is important to provide a sustainable budget for this program. The monitoring budget is important to manage to support the sustainability of the program. Funding for this system should be safe and sustainable. There are several aspect needs to be focused on such as performing the capacity building, increasing the teacher accountability, execute the accreditation process, transparent data on performance, and tangible actions for poor performance.

One of the fundamental aspects for the implementation of the VET system is the access given by government, universities and business or industry to participants (vocational teachers) in obtaining systematic and continuous training. It is also necessary to prepare trainers from business circles or industry and / or university lecturers who regularly visit transfer teachers in the built-in vocational schools and ensure that the training and equipment are up-to-date and relevant, thus addressing the needs of vocational teachers will increase its professionalism. To reach this stage, the Government has partnered with several companies when launching vocations in several regions.

The current business and industry developments require the Center for Development and Empowerment of Educators and Education Personnel (P4TK) to adjust to the needs and changes in graduate criteria in SMK. Currently, this center have no fields in the area of Energy and Mining, Health and Social Affairs, and Marines. For that required the

establishment of new P4TK field by cooperating between universities and the business and industry to manage these three fields as soon as possible. Without any special institutions that train educators in accordance with their field, the direction and objectives to be achieved from the graduate of SMK field is not will be fulfilled. The P4TK also need to follow the field of 295 National Competency Standards that released by the Ministry of Manpower. The quality of vocational education graduates is ideally determined on the basis of mastery over this National Competency Standard. It is also necessary to have the coordination level among ministries / institutions in making the missing field of standardization for each vocational skills program available.

The negative stigma of vocational school that inhibits the progress of vocational education demanded to be addressed immediately. This stigma could be diminished through a long-term public communications campaign. It is useful to introduce the value of the TVET. It needs to start from the community initiative to enroll their children in vocational schools. It needs the cooperation among the stakeholders of the link and match program in order to produce competent human resources and meet the challenges in the global market.

The career guidance among the student is hold an important role in changing this stigma. Through the implementation of career guidance services, a counselor could professionally help the student to determine the career based on their interest and ability. Guidance and counseling should always take preventive steps to students who have problems in career selection, especially to those who still see vocational schools as a second-class schools and the graduates such as technicians, mechanics, just equivalent to low-class workers. The

counseling should be invested to understand that the results of education are human beings who are able to adapt and be creative, not merely workers. Vocational School or SMK graduates don't have to / should get a job, but they must also be able to create jobs for themselves.

Assessment also need to be done, “since it is necessary to inform teachers, parents and policymakers about how well students are learning, and how different schools are performing against a national framework of educational standards”¹⁵. In this sense, it is important to improve the quality of National public examinations with more diverse assessment methods, particularly formative assessment in the classrooms. Through this effort, it will raise the hope of the parents and the student. They might see that vocational school is not a second option for a better future.

As a result of the mapping (by the ministries) it is necessary to restructure the areas of competency SMK that is not relevant or less in accordance with the needs of the market with a new field of competence. For example the field of maritime competence, a new field that has not been prepared yet, while natural resources in Indonesia are mostly related to marine.

The government also need to work on the standardization of education and training system in SMK. It is important to prioritize that the need for education in SMK must be standardized in order to achieve the quality achievement. Although this effort will be very

¹⁵ Hoeckel, Kathrin, Simon Field and W. Norton Grubb. April, 2009. OECD Reviews of Vocational Education and Training: A Learning for Jobs Review of Korea. 2009 Vocational Education in Switzerland.

challenging, given the limited human resources (especially vocational teachers), but efforts to standardize education and training system in SMK are urgently needed.

One of the programs that has been done by the current SMK education and training system in Indonesia to achieve standardization is the adoption of SMK education system in ISO standard, especially ISO 9001: 2008. Although in some cases the implementation of ISO standard is confronted with obstacles such as the readiness of SMK facilities that have not enough to achieve the ISO standard, human resource commitment and the availability of funds are also required to achieve ISO certificate, but awareness and care of several SMKs on the quality of service is increasing. Evidenced from the increasing proliferation of ISO-based accreditation standards in various SMK both public and private in Indonesia. It is expected that by having standards that lead to service and quality, then the implementation of SMK can be qualified.

It is also important to connect the education system to the employment and economic development framework. Therefore, in a high level of employer engagement, Indonesia need to have a more diversified and nationally coordinated system of vocational education as well as a systematic steering mechanism to enhance the bearing among the government portfolios. Similar to the apprenticeship barometer in Switzerland, it could be better if the government, along with other stakeholders establish a Labor Market Information Service. Ministry of Manpower could open a portal in their website with several information needed by all stakeholders within the vocational system such as the student, employers, schools and trade unions. This information could vary from the trend of each province and

district's supply-demand labor; information of areas of skills shortage and surplus; the ratio on employment and unemployment by level and field of qualification, and average graduate earnings; vacant positions, qualifications and any other useful information. The website should target all levels of society from various educational backgrounds. This portal could be very helpful for those jobseeker as well as the vocational training student who are about to graduate.

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국문초록

젊은 세대는 인도네시아의 크고 강력한 경제 성장에 기여할 수 있는 자산이 될 것이라 전망된다. 인도네시아의 경제 상황은 급속히 증가하고 있지만 여전히 높은 실직률을 보이고 있다. 이 문제의 원인 중 하나는 업계에서 요구되는 다양한 기술과 시장에서 사용 가능한 기술이 다르기 때문이다. 기존의 직업 학교는 졸업생을 시장에 배치 할 수 없다. 이 문제를 극복하기 위해 인도네시아는 이중 직업 훈련 및 교육 시스템을 면밀히 검토하고 있다. 이 시스템은 산업과 노동을 위한 윈 - 윈 솔루션으로 여겨지고 있다. 정부는 또한 2017 년 초 Advanced Politekniks Indonesia (APII) 협회를 설립하였는데 APII 는 공식적으로 등록 된 산업 및 학교 플랫폼으로서 인도네시아의 직업교육에 산업협회 멤버로서 산업의 개입을 목표로 한다. 스위스, 독일, 한국에 적용된 직업 교육 훈련 시스템은 인도네시아에 이중 직업 교육 훈련 시스템의 적용을 향상시키기 위해 채택 할 수 있는 몇 가지 특성들을 제공하였다.

주요어: 이중 직업 교육 및 훈련, 시스템, 도전 과제, 우수 사례, APII

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