International Journal of Vocational and Technical Education Research
Vol.5, No.2, pp.1-23, April 2019
Published by European Centre for Research Training and Development UK (www.eajournals.org)

A RELEVANCE OF THE IMPLEMENTATION OF VOCATIONAL SCHOOL (VS) TOWARDS THE NEEDS OF INDUSTRY AND WORKFORCE AND THE USE OF TECHNOPARK FOR TRAINING TEACHERS AND STUDENTS OF VS

Idris HM Noor[1] and Heni Waluyo[2]

[1]Research Centre, Office of Educational Research and Development, MOEC, Indonesia
[2] Curriculum Center, Office of Educational Research and Development, MOEC, Indonesia

ABSTRACT: *This study explores the relevance of vocational school (VS) and industries to meet the needs of industries in order to get quality workers from VS. Therefore, the government of Indonesia stresses to strengthen vocational school (VS) through training both in school, company, or in technopark in order that the graduate of VS may have better competence and skill. Quantitative and qualitative of the secondary data, the in-depth interview during the focus group discussion (FGD), and survey data was collected from 536 respondents from 36 VS in eight provinces. Analysis was the combination of qualitative and quantitative from both survey and document triangulated with interview of other related resource persons. The findings reveal that the relevance of training in school and the needs of the industries is 91,67% relevant, the relevance of knowledge and the needs of industries taught in school is 93.34% relevant, skill 93.34%, and attitude 97.5%. Teachers perceptions for the three aspects is 90.83%. Most of the VS school programs are in accordance to meet the needs of industries, which have been working collabotively with schools. Training in both industries and technopark has improved VS students and teachers' competence and skill. However, it is different with the reality that most of vocational school graduates have not been accepted by private sector or industries to work at their company due to the lack of several aspects, such as the skills which does not occur to the work of industries.*

KEYWORDS: relevance, kompetence, knowledge, skill, attitude, vocational school, technopark

INTRODUCTION

The tight competitiveness of the workplace in the globalization era needs a high quality human resource to compete with other workers from other countries. The problem faced by Indonesia in the globaliztion era and ASEAN Economic Community (AEM) as well as Asean Free Market (AFM) is to prepare human resource whose knowledge, skill, and attitude that meet the needs of industries and job market. Most of workers' applicants particularly the vocational school (VS) graduates are lack of quality. This low quality of human resources affects the raise of the unemployement. To overcome this problem, the Indonesian government established a regulation of Presidential Instruction No. 9 of 2016 about the quality improvement and human resource competitiveness. This instruction states that the vocational school curriculum should be relevant to the needs of industries, there should be link and match between school and industries, the enhancenment teachers' competence, collaborative

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working with other institutions such provincial educational office, industries traning centre, and Ministry of Labor.

Next, the percentage of unemployement rate of VS graduates in 2014 comparing with senior secondary school (SSS) graduates is still higher about 11.24 percent (Central Bureau of Statististics /CBS, 2014). The tight competitiveness in seizing the job market and the unbalanced supply and demand of the labor (ILO 2015:15) increases unemployment rates every year including VS graduates. Isgoren Cs. (2009:3) also found out that 38 percent of companies wants to get skill labourers whose good skill in computer, good management, and be able to use new technology. On the otherhand, the VS graduates, the most working seekers sometimes wished to change careers due to dissatisfaction with their current situation and wished to reorient their career because of a desire to undertake new projects (Masdonati, Fournier, Lahrizi, 2017). Data of unemployement from primary school to higher education shows that there are many workers dominated by the primary school graduates as shown in the following table.

Table 1. Level of unemployment of the population age 15 Years old above and the level of education graduate 2012-2014 (percent) primary to higher education

Level of Education	2012		2013		2014
	Pebruary	August	Pebruary	August	Pebruary
Primary School	3,59	3,55	3,51	3,44	3,69
Junior Secondary School	7,76	7,75	8,17	7,59	7,44
Senior Secondary School	10,41	9,63	9,39	9,72	9,10
Vocational School	9,50	9,92	7,67	11,21	7,21
Diplom I/II/III	7,45	6,19	5,67	5,95	5,87
University	6,90	5,88	4,96	5,39	4,31
Total	6,24	6,07	5,82	6,17	5,70

Resource: The Central Bureau of Statistics 2014

Data reveals that open unemployment decreases 0.47 percent from 6.17 percent on August 2013 to 5.70 percent on Pebruary 2014. On Pebruary 2014 open unemployment for senior secondary school (SSS) is the highest about 9.10 percent followed by Junior Secondary School (JSS) about 7.44 percent, then VS at 7.21 percent while the lowest open unemployment is Primary School (PS) about 3.69 percent. The high rates of open unemployment from the three levels of education including VS are mostly affected by the irrelevance of the schools programs and the needs of industries, the market place as well as the unbalanced supply and demand of the labor. Data also shows that the number of

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VS is 13.710 schools, 4.904.031 students, 292.212 teachers, 53.020 educators, 176.731 class, 162.426 classrooms (MOEC, 2018).

The lack of competitiveness of VS is affected by several aspects such as the unrelated professional subject study, professional study program and the professional skill stated in the VS 2013 curriculum and the industrial needed skill and competence, the content of the curriculum does not accommodate the potential of local natural resource, and the tightness of the working competitiveness for VS graduates which means that the very high gap between working supply and demand, and most of the graduates prefer working at big cities rather than managing their own natural resources at the provinces or districts (MOEC: 2015). Therefore, it is important to strengthen a collaboratively working between MOEC, provincial and district governments in managing the VS and the industries to strengthen the competence and skills of the VS students and teachers through training both at industries and technopark. Besides, there is also synchronization of VS curriculum and the needs of industries in order to minimize the gap between the instructional teaching and learning in school and the practical work in industries as well as to reduce the gap between the technology used in industries and in schools. (Edi, Suharno, Widiastuti, 2017).

To explore the competence and skills of students which are relevant to the needs of industries, the training should carefully select the students' needs to enhance their competences and skills which are relevant to the needs of industries, and the typology of technopark that can be used for training of VS students.

LITERATURE REVIEW

Educational Relevance

A relevance is a relationship between one aspect with another one or an organization or an institution with another one. This relationship is based on the similar objectives, concept or an understanding of each other principle of the needs. In education, a relevance can be viewed from several aspects, such as the internal of education itself and its relation with outside education. The internal relationship in education is related to the level of education, such as the relevance of the basic education and the midle of education, the relevance of midle education with higher education or non formal education.

An educational relevance can also be overviewed from the relationship of an educational institution with non educational institutions, such as industries or workplace, society or community or government. Therefore, it is understandable that the concept of a relevance has several meaning and objectives. However, the key point is that a relevance is associated with the connectivity, relationship, or mutual relationship of activities within similar principle and objectives. Therefore, the most important thing to be strengthen is the research and the development of science and technology, then put it into the teaching and learning process, so that the educational institution will produce high

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quality graduate with better competence relevant to the needs of industries (Ahmaloka: http://www.itb. ac.id/news/ 4425.xhtml).

National Development Planning Board (2009) put its programmes to strengthen the relevance of vocational education towards the needs of market place through collaboratively working between vocational education and industries, particularly in the field of strengthening human resources and the availability of industries' facilities for practical work of vocational school. The relevance of school and industries is on the other side presented through considering the world of work or industry to be able to accept students as well as the practice schedule in accordance with local conditions and a form of partnership particularly for the students practical work in industry (Ekawati, 2012:1). The partnership should be in the form of cooperation that bases on the Memorandum of Understanding (MoU) between the two parties (Vocational School and Industries), so that both parties can keep their rights and fulfill their obligations effectively (Azizah, Murniati, Khairuddin, 2015).

The relevance of VS in which the relationship between competence and skill stated in VS 2013 curriculum and the needs of industries is objected to enhance skill and competence of the VS graduates to meet the needs of industries. However, the VS curriculum consists of socalled general education subjects such as Indonesian language, history, mathematics, and physics (Rauner and Maclean, 2008:64).

In teaching learning process in VS, the relevance aims to strengthen a partnership between the industries, affirmation program, and job matching for VS graduates. The important technical skill program to be developed is the work competence of VS graduates, ICT, foreign language, entrepreneurship, and developing a partnership between school and insdustrial business. To achieve the program, it is needed a support from government and the help of industries to create a mechanism of meaningful teaching and learning process at VS. A relevance education and training should be and remain relevant to national development needs; industry and service sector needs; regional, local and community needs; individual development needs; and needs relating to the advancement of knowledge, science and technology (Finlay, Niven and Young, 1998:145).

A relevance of education and training should be in accordance with the government program to support the enhancement of technology application and the enhancement of human resource development so that the enhancement quality of employees work will be better to serve the companies and industrial needs. On the other hand, irrelevance of the educational and the needs of industries will be with the needs of industries and the product that make the inefective and ineficient of the program. Bridges and Husbands (Eds) (1996:78) quote Fullan (1991:316) that "staff development failed for a complex matrix of reasons due to the lack of relevance, poor follow-up to training as well as an absence of response to individual concerns. Therefore, it is tressed that a relevance of education

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and training in improving the human resource should meet the needs of industries in order they will have better quality of competence and skill for the work in industries.

Vocational School (VS)

The term of vocational school (VS) is used to refer to vocational education in the industrial/technical sector with the focus on in-school education. Vocational education is distinct from 'vocational training', which refers to on-the-job training at a company, and which connotes manual and 'simple' vocational activities (Rauner and Maclean, 2008:82) and more applied methods of teaching general education subjects (Pavlova, 2009:5). Traditionally, VS aims to prepare a skill middle workforce both to work at industries or to be independent work by creating their own jobs or for others (FME 2000, Akinyele, Bolarinwa, 2018).

Principally, the Commission on Adult Vocational Teaching and Learning (2013:5) in Avis (2018) states that the best vocational teaching and learning combines theoretical knowledge from the underpinning but should meet the needs of industry, meaning that the 'client' or 'customer (Stevenson, 2003:30) as a way of improving the vocational relevance of education to bring technology and vocational education together (Markowitsch and Hefler, 2018). Moreover, there is a need to include consideration of what students make of what they experience: how they construe what they experience, construct knowledge from it and engage with it and what they learn from it (Billett, 2011:189).

To fulfill the aims of the instructional teaching and learning in VS, the material of VS school subjects consists of theory and practice. The theory is conducted in school while practical work is conducted in school and in industries, so that they will get a basic working certificate. In implementing the so called programmes of VS, the Ministry of Education and Culture (MOEC) also set up a programme of Multy Entry Exit System (MEES) which accommodates students to be free to enter and exit the school for a certain time based on the students needs due to their economic problems. This program is flexible in instruction, free to enter and exit among the training institutions: Formal (Senior Secondary School and Vocational School) and Non formal (package A, B, C, and other training courses) or informal treams of study (self study). The approval of equality and equity of competence (certificate of competence) for kinds and level of competence gained through different level and stream of education (Noor, 2016).

Based on policy of the Directorate of VS, MOEC, the specific aim of VS is to strengthen the partnership, affirmative, and set up new high standard VS's as a reference model of other VS. The policy also stresses to strengthen a collaboration among MOEC, Provincial Government, and society/community as well as industries to empower VS's work competence, ICT, foreign languages, and working attitude. Meanhile the VS itself is forced to prioritize a soft skill program (attitude, motivation, creativity, performance, and others) in curriculum and syllabus as well as in a teaching and learning instruction rather than hard skill (the technical working skill). Besides, it is also important to enhance a commitment of the employees to encourage the management of the company

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to treat the staff as human beings through human approach which means that the company should not treat the employees as the only production factor but should have an effort to respect each employees as their self esteem, the employees will have a responsibilty, feel comfortable, enjoyable, and safe to do their work properly, then at last staff feel to have job satisfaction (Noor, Laskar, Imanuddin, 2018).

The development of Human Resource for VS is the responsible of the VS. A principle of human resource development refers to the achievement of the objectives of the organization and optimizing human and organizational growth and effectiveness. This significant reform in initial education and training will help provide employees with a highly skilled and adaptable future work force (Gough 2010:24) and such a remarkable performance may be attributed primarily to the successful development of a vocational education and training system which produced professionals in sufficient numbers (Finlay, Niven, and Young,1998: 61).

It identifies the needs of training for human resources development as "individual development adresses to such areas as skill development, interpersonal skills, career development, and occupational and group development concerned to training and development needs of employees consisting of learning, training and development in organizations the human resource compass, and organizational development (OD) describes as, 'a collection of planned change interventions, built on humanistic-democratic values, that seek to improve organizational effectiveness and employees well-being'.

The opinions about the development of human resources need a tight collaborative working among individuals in the group, so that an organization will be able to work effectively. This development gives an effect not only for the development of individual human resources but an implication to the completeness and enhancement of the organizational strengths. Through the development of the human resources, individual or groups is involved in the organization, then it will produce a planned product.

Facilities

It cannot be denied that the facilties play an important role in improving teaching and learning instruction. The completeness of good facilities the school have make the learning process effective, so that the target knowledge and skills to be shared to the learners will be achieved properly. However, these facilities should be in accordance with programs and the context of level and kinds of education. The facilities for Senior Secondary School (SSS) are different with the facilities of vocational schoool, where VS needs various kind of practicing facilities for each of the VS programs. For example, the Tourism VS facilities may need the facilities of preparing food and bevarage or room service or travel agent, where in machine VS program needs a technical machines such as automotive machines, and others. The completeness and the quality of facilities in fact may influence the target knowledge and skill of the school programs have. Therefore, the facilities should meet the needs of teachers and students in supporting their teaching and learning programs. Knowledge and skill chains depend on

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infrastructure systems fulfilling missions, facilities the school needs to support the educational program and the teaching staff (Osaka. Eiji Arai, 2005:1(ed), Earthman, 2009). The fulfilment of better facilities in teaching and learning instruction will support the improvement and enhancement of of students' competence and skills particularly for VS to meet the needs of industries.

Techno Park

Science and Technology Park or Science Technopark (STP) is an area of building for research and development of science and technology for business needs. This special area is designed for area building set up for science and technology as well as innovation integratedly for business and education in order the society and community around the area will get advantages for their life improvemen and their welfare earnings increases significantly. Technopark is different with other area such as the area of industrial park and business park.

Technopark is set up for several needs, such as for research and development (R&D), educational trainning/training centre, consultancy, facility provider, business mediation, information distribution, certification, and production support (http://www. bandungtechnopark. com). Industrial park activities focus on developing manufacture and business park oriented on administration. The head of telkom foundation Johni Girsang for example, claims that the concept of Bandung Techno Park (BTP) was named Science Park in order to produce income until 2 million US dollar/peryear (http://news.okezone.com /read//telkom-bangun-bandungtechno-park).

RESEARCH METHOD

This study explores the competence and skills of students which are relevant to the needs of industries, the training needs of the students to enhance their competences and skills for students, and the typology of technopark that can be used for training of VS students.

A survey method is used to collect data and analyze the feasibility of the relevance of science and technopark innovation spin off Politechnique or universities to enhance the human resource of vocational school (VS). A survey was conducted in 8 provinces and a case study was used to analyze specific cases of the VS. To get a deep comprehensive understanding about the relevance of VS and industries, the study also employs a qualitative study using a combined secondary data and comprehensive Focus Group Discussion (FGD).

Sample was 36 VS which were chosen using systemic and purposive techniques with criteria of VS that have a program of the development of human resource through technopark. Respondents were 536 persons consisting of 360 students from VS in which 15 students of each VS, 24 VS principals, 120 teachers, 8 persons from Agency for Regional Development, 24 persons from industries, 8 head

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of educational provinces and district offices, 16 head of sub- curriculum division from Educational Provincial/District Offices, and 8 Directors of Technopark.

Data analysis was to describe and to analyze the competence and skills of students with the needs of industries, the training needs of the students to enhance their competences and skills for students, and the typology of technopark that can be used for training of VS students. The process of the qualitative data analysis used the procedures of examining, categorizing, tabulating the frequency of events, recombining evidence, using arrays to display the data, creating displays, ordering the information, using various interpretations, triangulation, and making a conclusion.
Both data of the documentation and the data gathered from FGD are combined and described before taking a conclusion.

FINDINGS AND DISCUSSION

Teachers and school industries perception of the relevance of students' competence and skills trained in school towards the needs of industries.

1. The data reveals that 91.67 percent of education and training in school meets the needs of industries, and only 8.33 percent does not occur to program of the industries. These needs have fulfilled nearly all competences such as computer techniques, electronics, pharmacy, technology, tourism, product creative, accountancy, secretary, IT, machine, automotive, welding, construction, mechatronic, electrics, machine, technical chemical industries, multimedia, informatics, technical motorcycles, front office, laundry, housekeeping, LAN, MYOB, cultivation of seaweed, hotel and tourism, graphics design, bank service, nurses, annimation, office administration, technical automotive, and others.
2. The data also shows that 93.34 percent of knowledge and skill learned in school is relevant to the needs of industries, and the attitudes occupies show 97,5 percent relevant to the needs of industries.

There are three main aspects that students should master and to be trained simultanuously with the subjects study during students studying at the vocational school.

1. Knowledge. It consists of modern/sophisticated technology, the development of working force, function and working guides of tools, competence information, IT, management of water resource, business opportunities, learning materials of operation knowledge, innovation technology, basic skill and management of skill competence of VS students graduate.
2. Skill. This consists of subject learning material of VS stated in 2013 curriculum, the implementation of modern technology, foreign language, IT, maintenance and repairing as well as modification of tools, subject learning skill, computer assembling, information technology networking, fishery, service product management, newspaper design, process skill, technology development, IT technique, culture business, data maintenance, creation or production.

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3. Attitude. It consists of entrepreneurship, leadership, discipline, creativity, diligent, work hard, good mentality, moral, attitude, motivation, responsibility, honest, individual development, collaborative working, interview technique, high working culture attitudes, working motivation.

Table 2. Areas of expertise and the expertise competence needed by industries

No	Areas of Expertise	The Expertise Competence needed by Industries
1.	Technology and Engineering	Electronics, machines, automotive, welding, construction, mechatronic, electric, industrial chemistry engineering, industrial chemistry analysis, electronics industrial engineering, industry, motorcycle technique, electrical electronics engineering, technical services (automotive, construction, welding, electric), software of engineering technique, technique of construction, wood working technique, concrete construction techniques, mechanical engineering, automotive engineering, electric power engineering, electric power installation techniques, bulding technique, wood working techniques, electric power installation techniques
2.	IT and Communication	Computer engineering, programmer, Technology, IT, software, multimedia, technical information, computer network engineering, set up local area network (LAN), audio video engineering, technical light vehicle, motorcycle engineering, mapping survey technique, pictures building technique, annimation, information technology, computer programming
3.	Health	Pharmacy, nurses, health services
4.	Agribusiness and Agritechnology	Chocolate processing
5.	Fisheries and marine affairs	Artificial giving technique, seaweed cultivation, produce fish feed, culturally natural fish feed, basic safety trainning, nautics expert of basic level, arrest method, expert arrest of catch and cultivation, fishing navigation
6.	Business and management	Accounting, secretary, local area network (LAN), MYOB for accounting, office administration, financial service (banking)
7.	Tourism	Front office, laundry, housekeeping, patisserie, hotels, catering services
8.	Art	Creative products, graphic design

The area of expertise to be mastered by VS graduates to meet the needs of industries consists of ten expertise competences. Among eight areas of expertise and the expertise competences stated

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at the table 2 above are Agribusiness and Agritechnology, Fisheries and Marine Affairs as well as Art, and these areas of expertise become the icon of the regional and district which have natural resources. The expertise of VS can refer to all walks of life (John, 2003:4). For instance, it can refer to occupational undertakings or undertakings in life more generally-for example, an expert plumber, gardener, public speaker or bike-rider. When referring to work, expertise sometimes refers to whole occupations such as an expert lawyer, motor mechanic or politician.

Next, the data about the school principal's perception shows that 91.7 percent of VS graduate is about the absorption of labor by industries. The small part (about 8.3 percent) of the graduates which is unable to be absorbed by industries due to some aspects (see in the following tabel 2).

Table 3. The main cause of VS graduates is unable to be absorbed to work by industries

1.	Curriculum of VS does not match with the work of industries
2.	Teaching and learning process at the VS are not effective
3.	There are more graduates than the labourer needed (supply is more than demand)
4.	The number of industries is less than the number of VS graduates
5.	The competence and skill of VS graduates do not match with the needs of industries
6.	VS graduates find difficult to get the competence certificate. As a result there is a small number of VS graduates whose the competence certificate
7.	There is a very tight working competition with the laborer from other provinces or other places
8.	The VS are lack of English
9.	The working attitude of VS graduates such as: motivation, performance, metally, working integrity are lack and does not occur with the working standard of industries
10.	Some graduates prefer to continue their study at universities
11.	Some graduates do not like to work as an operator in industries
12.	Infrastructure and facilities in industries are better and more sophisticated than the facilities in school, so that VS graduates who have not been familiar with the industrial facilities are unable to operate them when they work in industries.
13.	Many Schools have no link and match with industries
14.	Some graduates are still influenced by their culture that they are scare to leave their parents to wander at the other regions or provinces
15.	VS has no communication network with industries so that their competence are not relevant with the industries needs
16.	The skill work of VS graduates does not occur with the skill of the industries' needs
17.	There is a gap between competence of a skill and softskill
18.	There is a limited of training and workshop, limitation of facilities, the facilities in industries are more modern than the school facilities

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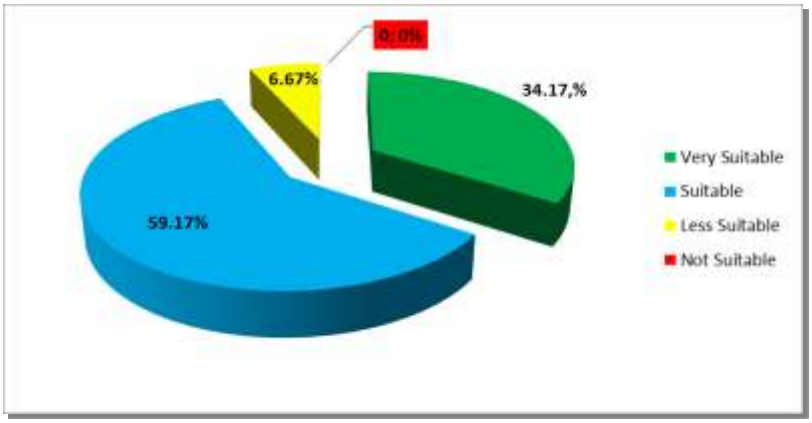
Table 2 lists the three categories of VS graduates weaknesses that make industries unable to absorb them to work at the industries. These categories are grouped into three main components: a) internal component covers curriculum, teaching and learning process, very limited VS graduates whose certificate of competence, b) external components covers some aspects which are related to the absorption of VS graduates and the needs of industries, and c) training and workshop components covers the internal training in school, training in industries, and training in technopark.

These kinds of training keep their own roles and function, such as the training in school tends to train students with basic knowledge and practice with limited facilities or just the practice of their theory they have in the class as it is stated in the curriculum. On the other hand, the training condition in industries has complete facilities with high sophisticated technology and facilities as the industries need and the real context of the work in industries. The training in technopark is more similiar with the training in industries. The training in this place is conducted to overcome the problems of schools which do not have sufficient facilities as it is in industries. By training in technopark, students as well as instructors or teachers will hopefully have experience to operate new technology as it is needed in industries.

The following chart (1) presents the teachers' perception about the accordance area of expertise, program of expertise, package of expertise, competence, and skill of of expertise package in VS with the needs of industries.

Chart 1: Teachers' perception about the area of expertise of VS and the needs of industries



Data reveals that 93.34 percent of the program of expertise, package of expertise, competence, and skill of of expertise of VS meets the needs of industries. This means that the VS programs of all expertises are in accordance with the needs of industries.

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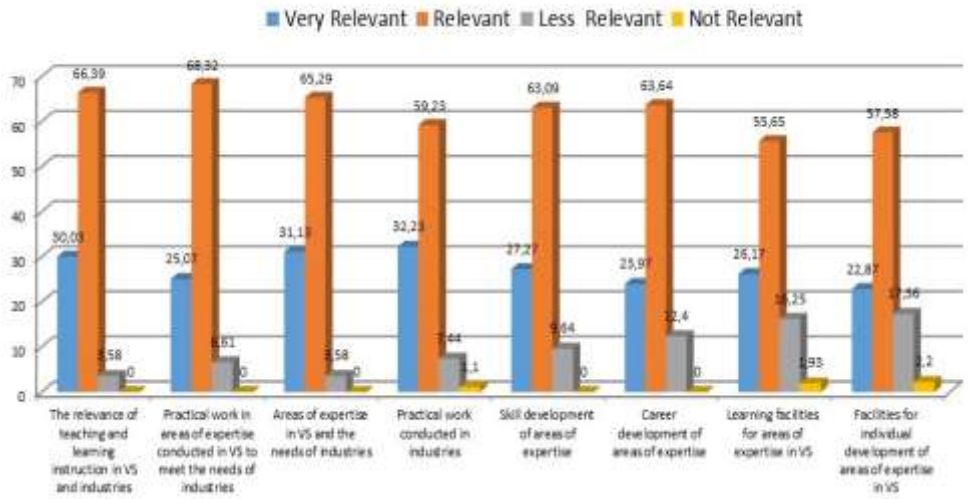
The following chart (2) explains the teachers' perception about a relevance of knowledge, skill, and attitude taught in VS and the needs of industries. The charts consists of eight aspects: 1) the relevance of teaching and learning instruction in VS and industries, 2) practical work in area of expertise conducted in VS to meet the needs of industries, 3) areas of expertise in VS and the needs of industries, 4) practical work conducted in industries, 5) skill development of areas of expertise, 6) career development of areas of expertise, 7) learning facilities for areas of expertise in VS, and 8) facilities for individual development of areas of expertise in VS.

Chart 2: Teachers' perception of the expertise area of VS and the needs of industries



From eight aspects area of expertise of VS and the needs of industries, teaching and learning instruction in VS and industries as well as the practical work in areas of expertise conducted in VS become the most favourable and relevant aspects with the needs of industries. Others are practical work conducted in industries, skill development, career development, learning facilities for areas of expertise in VS, facilities for individual development of areas of expertise in VS. On the other hand, there is a small amount of respondents who claim less relevant and not relevant about knowledge, skill, and attitude taught in VS and the needs of industries. Next, teachers's perception about students' mastery towards the knowledge, skill, and attitude which is relevant to the needs of industries is average 94,33 percent (See table 4).

Table 4: Teachers' perception about the accordance of students' knowledge, skill, and attitude towards the needs of industries

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Attitude: Fulfilled

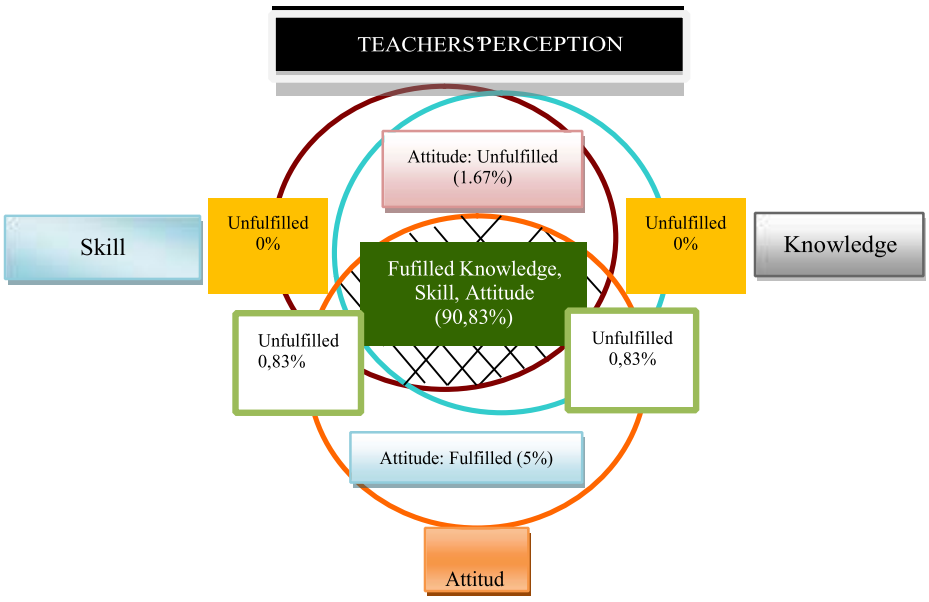
		Skill		
		Fulfilled	Unfulfilled	Total
Knowledge	Fulfilled	90.83%	0.83%	91.67%
	Unfulfilled	0.83%	5.00%	5.83%
	Total	91.67%	5.83%	97.50%

Attitude: Unfulfilled

		Skill		
		Fulfilled	Unfulfilled	Total
Knowledge	Fulfilled	1.67%	0.00%	1.67%
	Unfulfilled	0.00%	0.83%	0.83%
	Total	1.67%	0.83%	2.50%

The teacher's perception about their students knowledge, skill, and attitude is very high (90.83%) and the rest about 0.83 percent of the teacher's perception is low. 5 percent of teachers believe that the students own attitude which is relevant to the needs of industries although there are some weaknesses. On the other hand, 1.67 percent of teachers believe that their students are lack of attitude which is relevant to the needs of industries but have strong knowledge and skill needed by industries.

Chart 3. Teachers' perception about the student's level of knowledge, skill, and attitude



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The perception of industries about VS student's the knowledge, skill, and attitude is different with the teachers' perception. The industries' opinion about the level of the students' abilities tend to unsimilar with the teachers' perception. Industries rate 81.82 percent that VS students have knowledge, 77.28 percent have knowldge and skill, 63.64 percent have knowledge and attitude which meet the needs of industries. Generally, industries rate the 63.64 percent that VS students have knowledge, skill, and attitude as it is in accordance with the needs of industries, however 9.09 percent of them are not relevant to need of industries.

Table 5. The perception of industries about a suitability of knowldge, skill, and attitude

Attitude: Fulfilled

		Skill		
		Fulfilled	Unfulfilled	Total
Knowledge	Fulfilled	63.64%	0.00%	63.64%
	Unfulfilled	0.00%	9.09%	9.09%
	Total	63.64%	9.09%	72.73%

Attitude: Unfulfilled

		Skill		
		Fulfilled	Unfulfilled	Total
Knowledge	Fulfilled	13.64%	4.55%	18.18%
	Unfulfilled	0.00%	9.09%	9.09%
	Total	13.64%	13.64%	27.27%

The following chart 4 describes the industries' perception of the level of students' knowledge, skill, and attitude

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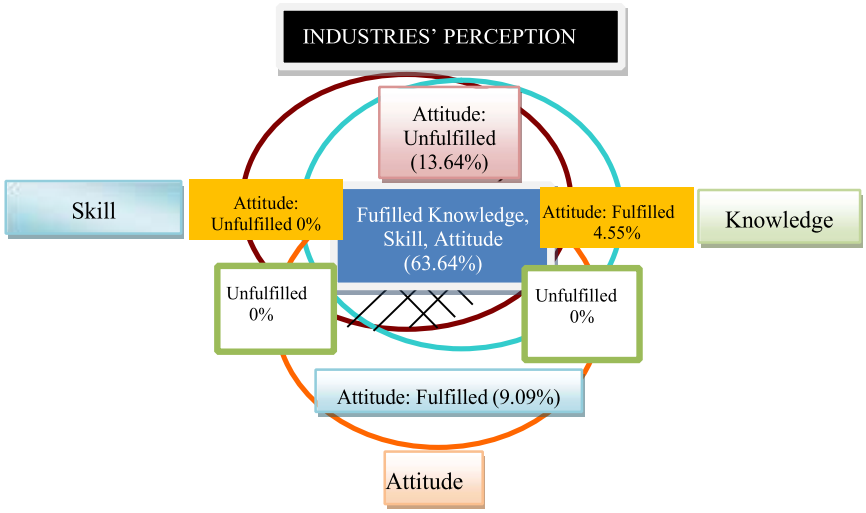
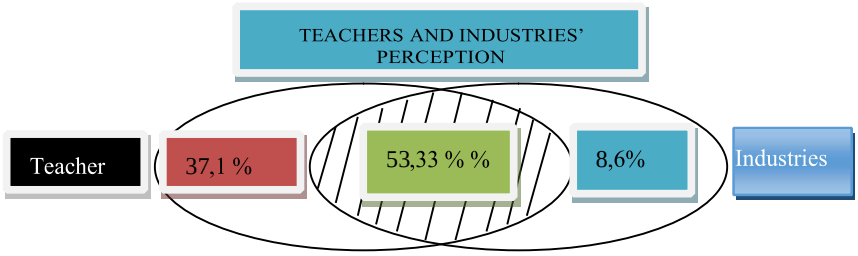
Chart 4. Industries' perception of the level of students' knowledge, skill, and attitude



The 13.64 percent industries conclude that VS students have attitude which does not occur to the needs of industries but knowledge and skill are relevant to the needs of industries. 9.09 percent of industries rate that VS have attitude to meet the needs of industries although there is still some weaknessses in knowledge and skill needed by industries.

Chart 5. Teachers and industries' perception of mastery level of VS students' knowledge, skill, and attitude



There is a proportion of different opinion between teachers and industries about students' knowledge, skill, and attitude. Finding indicates that there is 55.33 percent of the same opinion of both school and industries. 37.10 percent teachers rate that their students have fulfilled the level of knowledge, skill, and attitude the industries needed, however industries regard that students do not have fulfilled the level of knowledge, skill, and attitude the industries needed. Meanwhile, 8.6 percent industries rate that the students have fulfilled the level of knowledge, skill, and attitude the industries needed, however teachers regard that students have not fulfilled the level of knowledge, skill, and attitude the industries needed.

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Training

The following table 5 explains a technique of industries in deciding a competence of VS graduates to be trained in technopark. One of them is that to select the areas of expertise and skill of each student based on the industries' needs. Others are competence, skill, curriculum, instructional teaching and learning which are relevant to area of expert in industries.

Tabel 6. A technique of industries in deciding a competence of VS graduates to attend a training in technopark

1. A selection of an area of each student expertise and skill based on the competence and level of understanding of the VS graduates towards industries
2. A selection of VS experienced graduates
3. Making job test as a model of selection by industries
4. Aural (interview) and written competence test
5. A competence test and direct practice at the industries
6. Train a suitable skill
7. Screening receipt and analysis receipt
8. Deciding a job to be done in industries, having enough time to communicate with industries, and training based on real job to be done in industries
9. Syncronize the VS curriculum with the needs of industries and competence in VS
10. Special training of knowledge and skill about automotive especially Toyota brand four-wheel vehicle
11. Syncronize with product made by VS target
12. Yamaha curriculum to be implemeneted, syncronized with needs of industries, but basic output of students not absorbed

The students' ability stated in students'competence and skill become a standard of industries in deciding whether VS graduates be able to train in technopark before the students are accepted to work in industries. The objective of training in technopark is to train VS students to acquire competence needed by industries so that after training they will be able to work in industries. Besides, training in technopark may give VS students a real experience about job and facilities as it is used in industries. Training in technopark is also coducted for VS students due to the limited facilities at industries to train VS graduates.

Training at techno park

In improving aspect area of students expert competence, industries need to train VS students with real work in industries both through training in school and in industries. However, industries and school

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are unable to train all VS students due to the limitation of their facilities. The school facilities mostly have been out of order and are not suitable for indutries. Therefore, industries work collaboratively with technopark to train VS students and its graduates in order to be able to work in industries. Chart 6 explains the relevant training in technopark to improve competence expertise of VS students to meet the needs of industries.

Chart 6. A training in technopark for competence expertise improvement of VS students to meet the needs of industries

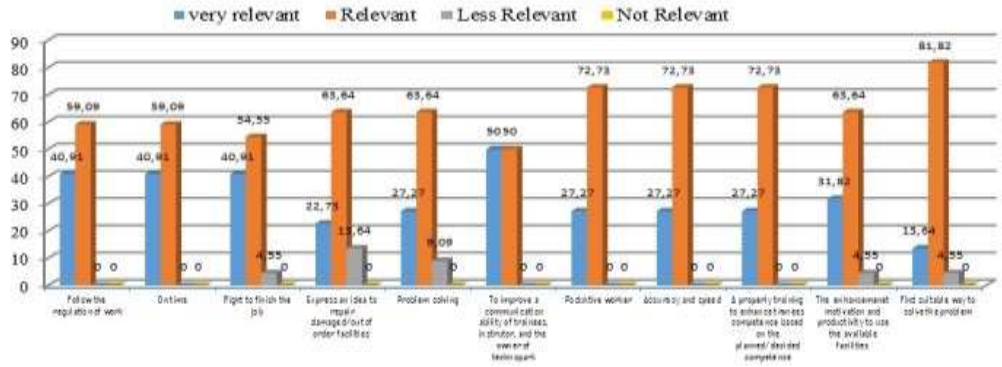

Chart 6 describes aspects needed by industries to be trained in technopark. Componen of competence which most relevant (100%) to meet the needs of industries are: on time, follow the regulation of work, improve a communication ability of trainees, instrutor, and the owner of technopark, and poduktive worker, accuracy and speed to choose an action taken. Other relevant componens (95.46%) are: right to finish the job, the enhancement motivation and productivity to use the available facilities, and find suitable way to solve the problem. The important aspects to solve a problem (91%) are to express an idea to repair out of order facilities (for example, damaged facilities 86.37%), a properly training to enhance trainees competence based on the planned/decided competence.

Aspect of VS graduates competence needed by industries but less relevant is to find suitable way to solve the problem and to enhance motivation and productivity to use the available facilities (each of them is 4.55%) followed by a problem solving.

Facilities and function of technopark

Table 6 describes some functions and facilities of technopark which are relevant to VS graduates competence and the needs of industries.

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Tabel 6. Facilities and function of technopark

No	Function and Facilities of Technopark	A Relevance of Competence of VS Graduate with the Needs of Industries			
		Very relevant	Relevant	Less relevant	Not relevant
1	Support of production	75	25	0	0
2	Certificate	25	75	0	0
3	Centre of Training/Research laboratory	100	0	0	0
4	Consultation	100	0	0	0
5	Delivering information	50	50	0	0
6	Business mediation	75	25	0	0
7	Provider facility	25	75	0	0
9	e-Camp (Business incubator).	100	0	0	0
10	Mechanical industry	25	75	0	0
11	Agriculture/forestry	25	25	25	25
12	Marine/fisheries	25	25	25	25
13	Manufacturing sector	25	50	25	0
14	Electro	25	50	0	25
15	Supporting oil and gas	0	50	25	25
16	Shipping	25	50	0	25
17	Animation field	25	25	25	25
18	Technical service unit Information Technology and Communication	25	75	0	0
19	Centre for Telecommunication Design	75	25	0	0
20	Medical industry	0	25	50	25
21	Garment (Textile and apparel)	0	50	25	25
22	Building and construction	0	0	75	25
23	Plastic dan Polymer	0	25	50	25
24	Furniture	0	0	75	25

Print ISSN: ISSN 2059-1187, Online ISSN: ISSN 2059-1195

Data reveals that the centre of training/research laboratory, consultation, and e-camp (business incubator) show hight function, each of them 100 percent very relevant, followed by support of production, business mediation, and centre for telecommunication design with 75 percent very relevant each. Certificate, provider facility, and technical service unit information technology and communication keep relevance of competence of VS graduates with the needs of industries with 75 percent relevant.

On the other hand, building and construction and furniture place 75 percent less relevant. These levels of relevance of VS graduate competence with the needs of industries show the priorities of the function and facilities of technopark in running their bisness. The prioritization of the function and facilities of technopark indicates that the technopark gives a very big chance to VS students to use the facilities to help develop human resource through training.

Typology of technopark which is in accordance with province and district potential to decide a policy of developing technopark

a. Technopark based on IT (Technology of information and communication and the centre of telecommunication design and e-Camp (Business incubator)
b. Technopark based Engineering machine (engineering machine, pharmacy and medical devices, textile and apparel)
c. Technopark based construction and construction (plastic and polymer as well as furniture)
d. Technopark based maritime and marine resources at Lombok coast, and aquaculture (Gili Mataram) West Nusan Tenggara
e. Technopark based Agriculture

Tabel 7. Kinds and area of expertise of current technopark in Indonesia

Kinds of Technopark	Area of Expertise								
	Technology and	Technology Information and	Health	Agribusiness and	Marine	Businessand Management Tourism	Art	Performing	
Bandung Technopark	√	√				√			
Batam Technopark	√	√				√			

Print ISSN: ISSN 2059-1187, Online ISSN: ISSN 2059-1195

Centre for Development Science and Technology Serpong	√								
Solo Technopark	√								

CONCLUSION

Based on the findings and iscussions, the teachers and the industries' perception are different towards the the level of students competencies about knowledge, skill, and attitudes. Teachers' perception towards the three aspects are positive while industries' views that they still have a lot of weaknesses. Teachers view that all expertise competences taught in VS are in accordance with the needs of industries. A relevance of training in school with the needs of industries is very high (91.67%), and the knowledge is about 93.34 percent. The three competences (knowledge, skill, and attitude taught in VS are all nearly meet the needs of industries.

However, there are some aspects that have not been fulfilled: a) internal factors such as competence of VS graduates which have not met yet the needs of industries, curriculum does not fulfill the needs of industries, teaching and learning process are not effective, most of VS graduates have not got certificate yet, they are incapable of English skill, some graduates are not interest to work as an operator in industries, b) there is a gap between supply and demand (more graduate than job vacancy) which means that there are many graduates than the employees needed by industries, many VS do not have communication network with industries that makes the students competences are not relevant to the needs of industries, c) lack of education and training, lack of training centre, there is a gap between skill competence and soft skill, many facilities in VS have been out of order/broken/damaged, while in industries facilities are more modern, training and education do not occur with the needs of industries.

The teachers' perception about knowledge, skill, and attitude of VS students is very high, however industries rate these VS competences still have weaknesses.

The study also concludes that the relevance of the function and facilities of technopark with the competence of VS graduates and the needs of industries is very high especially about the supporting production function, provider facilities, e-camp/incubator business, and cosultancy function. On the other hand, such as research and training plays small functions although these two functions are the main icon of the technopark.

Industries work collaboratively with technopark to train VS students and graduates in order they are able to work in companies managed by industries' organization. Therefore, according to industries, aspects of competences to be mastered by VS graduates in the training is to fulfill the needs of industries.

Print ISSN: ISSN 2059-1187, Online ISSN: ISSN 2059-1195

POLICY IMPLICATION

Based on the findings and conclusion of the study, it is recommended that:

1. Vocational School (VS) should enhance their capacity through improvement of the teachers' competency and skill particularly the productive areas of expertise teachers.
2. VS should establish a cooperation with industries which have relevant programs
3. To improve the competence and skill of VS teachers, VS should enhance training intensity/training frequency both in industries and in technopark
4. VS should also be active to establish a network with both government such as Ministry of Labor and private sectors particularly for training chances for VS students
5. Teachers should be creative in instructional learning to support practice activities for expertise productive areas
6. Provincial Educational Office and Directorate of Vocational School, Ministry of Education and Culture should tighten a license of VS establishment due to the over production that effect the increase of the unemploymenet in industrial work. Besides, they should also close the VS which have no a partner with industry which means that an industry does not support the VS program.
7. Technopark should give an access to VS to attend the training at technopark
8. Industries should be actively look for a chance for VS to attend a training

REFERENCES

Ahmaloka: http://www.itb.ac.id/news/4425.xhtml

Akinyele, T.A and Bolarinwa, F.F.B. (2018). Prospects, Issues and Challenges of Technical and Vocational Education and Training (TVET) in Revamping Nigeria Depressed Economy.

Arai, Osaka. Eiji (Ed) (2005). Knowledge and Skill Chains in Engineering and Manufacturing. Information Infrastructurein the Era of Global Communications. International Federation for Information Processing. Springer Science Business Media, Inc. 233 Spring Street New York NY.10013 USA

Avis, J. (2018). Crossing Boundaries: VET, the Labour Market and Social Justice. International Journal for Research in Vocational Education and Training (IJRVET).Vol. 5, Issue 3, November 2018, 178-190

Azizah,. Murniati AR,. Khairuddin, (2015). A Strategy of Working Collaboratively Between Vocational School and Industries to Enhance Graduates Competence at Public Vocational School 3, Banda Aceh, Indonesia. Jurnal Administrasi Pendidikan Pascasarjana Universitas Syiah Kuala Volume 3, No. 2, Mei 2015 (https://researchmedia. com/media/ publications/ 93817-ID)

Billet, S. (2011). Vocational Education. Purposes, Traditions and Prospects. Springer Science+Business Media B.V. Mount Gravatt Campus 4112 Griffith Queensland Australia

Print ISSN: ISSN 2059-1187, Online ISSN: ISSN 2059-1195

Bridges. D and Chris, H (Eds).1996. Consorting and Collaborating in the Education Market Place. Falmer Press. London

Centra Bureau of Statististics /CBS, (2014). https://www.bps.go.id

Edi, S,. Suharno,. Widiastuti, I. (2017). The Development of Implementation Standard of Practical Working in Industries of VS students Technical Machine Programme in Surakarta (A Case Study). Journal of Educational Technical Programme. Homepage: https://jurnal.uns.ac.id/jptk. JIPTEK, Vol. X No. 1, January 2017.

Ekawati, A.D. (2012). Working Relationship with the Business/Industrial World. (A Case Study at public VS Donorojo Pacitan District, East Java), Post graduate, Muhammadiyah University Surakarta, Eat Java. Indonesia.

Finlay I,. Stuart, N,. and Stephanie, Y (Eds). (1998). Changing Vocational Education and Training. An international comparative perspective. Routledge 29 West 35th Street, New York, NY 10001

Girsang, J. Science Park/Bandung Techno Park (BTP). http://news.okezone.com /read//telkombangun-bandung-techno-park.

Gough, S. (2010). Technical and Vocational Education and Training: An Investment-Based Approach. The Tower Building 11 York Road London SE1 7NX

International Labour Organization (ILO) (2015). Information System and Labor Market Service. ILO Jakarta

Isgoren, N.C (et all). (2009). The importance of Cooperation between Vocational Schools And Industry. Marmara University Vocational School of Technical Sciences, Goztepe Campus, Istanbul, 34722, Turkey

John, S (2003). Developing Vocational Expertise. Principles and Issues in Vocational Education. Allen & Unwin 83 Alexander Street Crows Nest 2065 Australia

Markowitsch, J. and and Hefler, G. (2018). Staying in the Loop: Formal Feedback Mechanisms Connecting Vocational Training to the World of Work in Europe. International Journal for Research in Vocational Education and Training (IJRVET). Vol. 5, Issue 4, December 2018, 285-306

Masdonati, J,. Fournier, G,. Lahrizi, I.Z. (2017). The Reasons Behind a Career Change through Vocational Education and Training (IJRVET). Vol. 4, Issue 3, November 2017, 249-269

Ministry of Education (MOEC). (2015). A Solution to Overcome Unemployed of Vocational School Graduates. Directorate of Vocational School, Directorate of Basic and Midle Education, MOEC. Jakarta.

Ministry of Education and Culture (MOEC). (2018). A Condition of Vocational School in Indonesia in 2017/2019, Centre for Statistics. Jakarta

National Development Planning Board. (2009). A Relevance of Vocational Education towards the Needs of Marketplace. Jakarta

Print ISSN: ISSN 2059-1187, Online ISSN: ISSN 2059-1195

Noor, I. (2016). Multi Entry and Exit System (MEES) Implementation at the Vocational School Texmaco, Karawang, West Java Indonesia International Invention Journal of Arts and Social Sciences Vol. 3(5) pp. 56-65, October, 2016

Noor. I,. Laskar, S,. Imanuddin, F. (2018). Job Satisfaction to Enhance A Commitment Of Employees' Organization at Dream Tour and Travel Company, International Journal of Education, Learning and Development European Centre for Research Training and Development UK (www.eajournals.org. Vol.6, No.3, pp.47-59, March 2018)

Pavlova, M. (2009). Technology and Vocational Education for Sustainable Development.Empowering Individuals for the Future. Springer Science+Business Media B.V.

Presidential Instruction of Republic Indonesia No. 9 of 2016 about Revitalization of Vocational School to Enhance A Quality and Competitiveness of Human Resource.

Rauner, F and Maclean, R. (2008). Handbook of Technical and Vocational Education and Training Research, Springer Science+Business Media B.V.

Surbakti Indra M. (2018). Data and Facts of Working of Vocational School Graduates. Directorate of Vocational School, Directorate of Basic and Midle Education, MOEC. Jakarta

Stevenson. J. (ed). (2003). Developing Vocational Expertise. Principles and issues in vocational education. Allen & Unwin 83 Alexander Street Crows Nest 2065 Australia.

Tempo Magazine (2014). Opend unemployement based on the Education Level January 7. 2014

ACKNOWLEDGEMENTS

The author is grateful to Office of Educational Research and Development for funding this study, the provincial Educational Office for the recommendation to allow the schools in the area to participate in this study. The deeply thankful is also address to Vocational Schools and technoparks who have participated and shared the experiences during the the research conducted.

Author contributions

Noor, Idris HM and Heni Waluyo design research, performed research, and data analyzed. Both authors wrote the paper, proofread, and approved the final manuscript.

Print ISSN: ISSN 2059-1187, Online ISSN: ISSN 2059-1195