

PROCEEDINGS

International Conference

Asosiasi Pendidikan Teknologi dan Kejuruan Indonesia (APTEKINDO) 2018

Theme:

**“Revitalization of Technical and Vocational Education to Face
Industrial Revolution 4.0”**

Surabaya, 11-14 July 2018

Speakers:

Prof. Dr. Muhadjir Effendy, MAP.
Minister of Education and Culture, Republic of Indonesia

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*Extraordinary and Plenipotentiary Ambassador of the Federal Republic of Germany to
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Prof. Dr. Muchlas Samani, M.Pd.
Rector of Universitas Negeri Surabaya period 2010-2014 (Indonesia)



Faculty of Engineering
Universitas Negeri Surabaya
2018

PROCEEDINGS

International Conference

Asosiasi Pendidikan Teknologi dan Kejuruan Indonesia (APTEKINDO) 2018

Theme:

“Revitalization of Technical and Vocational Education to Face Industrial Revolution 4.0”

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PREFACE

All praises be to Allah SWT, so that the 2018 International Conference of ***Asosiasi Pendidikan Teknologi dan Kejuruan Indonesia (APTEKINDO)*** could be held in Surabaya during 11-14 July 2018. APTEKINDO International Conference is conducted biennially in which this year host is Faculty of Engineering, State University of Surabaya. There were sixteen colleges attending this year Conference, most of which were former Institutes of Teacher's Education (LPTK).

This year theme is "*Revitalization of Technical and Vocational Education to Face Industrial Revolution 4.0*" aimed to respond to the development and acceleration of the industrial revolution 4.0 that has become the most discussed issues in many countries. Industrial revolution connects machines with internet systems. In regard to facing such phenomena, Indonesian government through the Ministry of Industry has launched "Making Indonesia 4.0", of which the program focuses on industries that are driving the development of the industrial revolution 4.0 such as food and beverages, electronics, automotive, textiles and chemicals. To achieve better results of the program actualization, vocational education helps to prepare compatible and competitive workers for the areas of the aforementioned industries. Henceforth, numbers of Conferences, conventions, and meetings among Indonesian practitioners in FPTK / FT-JPTK need to be held to initiate ideas in strengthening the role of LPTK within industrial revolution 4.0 era.

The Conference's proceedings contain 121 research papers and ideas that are relevant to the following nine sub-themes: *Technical and Vocational Teacher Competencies, Technical and Vocational Education Curricula, Technical and Vocational Education Models, Technical and Vocational Education Evaluation, Technical and Vocational Education Policy, Public-private Partnership in Technical and Vocational Education, Technical and Vocational Education Management, Technopreneurship, and Competencies Certification.*

Finally, all the committees send their gratitude to the participating speakers and all parties who support the run of the Conference. They also apologize for any inconvenience and wish a better undertaking event next year.

WELCOMING SPEECH RECTOR UNESA

Conference and Convention

Asosiasi Pendidikan Teknologi dan Kejuruan Indonesia (Aptekindo) 2018

Rich Palace Hotel Surabaya, 11-14 Juli 2018

Assalammu'alaikum Warahmatullahi Wabarakatuh.

Respectable Head of Universities, members of APTEKINDO

Distinguished Keynote speakers

Honorable authors, and fellow participants of APTEKINDO Conference and Convention 2018

Alhamdulillah, first of all, let us express our gratitude to Allah SWT because of his grace and blessings, we are able to attend this international Conference and convention of the Indonesia Association of Technology and Vocational Education or ***Asosiasi Pendidikan Teknologi dan Kejuruan Indonesia (APTEKINDO)*** held in Surabaya, 11-14 July 2018.

This international and national Conference is conducted biennially as a routine agenda held by Association of Technology and Vocational Education or *Asosiasi Pendidikan Teknologi dan Kejuruan Indonesia (APTEKINDO)*, which consists of 16 different universities throughout Indonesia. We would like to thank for the opportunity given to Universitas Negeri Surabaya for hosting this year event.

In the raise of industrial revolution, Conferences, gatherings, and sharing of knowledge play an important meaning in supporting the acceleration of innovative science and technology. Therefore, this Conference's theme is ***"Revitalization of Technical and Vocational Education to Face Industrial Revolution 4.0"***. This is an interesting and challenging topic not only for academic researchers but also for stakeholders and industry owners.

Ladies and gentlemen,

Since 2011, the industrial sector has been integrated with the online system known as industrial revolution 4.0. The first industrial revolution was marked by the use of steam engines to replace human and animal power. The second stage of the revolution was marked by the utilization of electrical power and the concept of mass production. Furthermore, the application of automation technology brought the industrial revolution to its third stage. Tremendous revolution happened when information and communication technology was introduced and fully utilized in industrial area, of which the condition brought the world in the fourth stage of the industrial revolution. The utilization of this technology changed not only the production process, but also across the industrial chains that result in a new digital-based business model which can achieve higher efficiency and better quality in industrial products. The consequences of this revolution are the increase of production efficiency as well as changes in the employment prerequisite. There is an increasing demand for new manpower, whilst the machines are replacing the role of workers. This condition leads to the importance of a new and more advanced method of preparing human resources that are ready to compete in the industrial revolution.

Ladies and gentlemen, in regard to prepare Indonesian human resource in facing the era of media convergence, there are at least two aspects that need our attention, namely the quality of human resources in accordance with the requirement of the digital-based industry and the equal distribution of qualified human resources especially in suburban and urban areas. Both aspects could be meant as a challenge and an opportunity for the higher education especially technology and vocational education to innovate and harmonize curriculum that connects with the industry. Thus, this Conference becomes a perfect momentum for technology and vocational education to join and strengthen steps in preparing graduates that are ready to compete in the industrial revolution 4.0. Therefore, by starting with **“Bismillahirrahmanirrahim” The Conference and Convention of Association of Technology and Vocational Education or APTEKINDO 2018, is officially started**”

Ladies and gentlemen, we would like to thank the keynote speakers who are willing to attend and share knowledge in today’s Conference:

1. Prof. Dr. Muhadjir Effendy, MAP. Minister of Education and Culture, Republic of Indonesia
2. Michael Freiherr Von Ungern–Sternberg, ***Extraordinary and Plenipotentiary Ambassador of the Federal Republic of Germany to Indonesia, ASEAN and Timor-Leste.***
3. Prof. Dr. Wenny Rahayu, *La Trobe University Victoria (Australia)*
4. Prof. Dr. Muchlas Samani, M.Pd., *Rector Universitas Negeri Surabaya (2010-2014).*

We also would like to thank the authors and all participants of the convention who have participated and contributed to sharing the knowledge and ideas. Hopefully, what we share and get here today can give benefits and contribute to improve a competitive atmosphere in Indonesia, Aamiin YRA.

Surabaya, July 2018
Universitas Negeri Surabaya
Rektor,

Prof. Dr. Warsono, M.S.

WELCOME SPEECH BY THE DEAN OF FACULTY OF ENGINEERING
at the International Conference and National Convention of
Asosiasi Pendidikan Teknologi dan Kejuruan Indonesia (APTEKINDO) 2018
Rich Palace Hotel, 12 July 2018

Assalamu'alaikum Warahmatullahi Wabarakatuh.

His Excellency, Rector of Universitas Negeri Surabaya
Respectable the Head of Universities as the members of APTEKINDO
Distinguished Keynote Speakers
Honorable authors and Participants

Alhamdulillahirobbil alamiin. Thanks God. First of all, let us express our gratitude to Allah SWT because of his grace and blessings we are able to attend the 9th International Conference and convention of ***Asosiasi Pendidikan Teknologi dan Kejuruan Indonesia (APTEKINDO)*** and the 19th workshop of the Technology and Vocational Education for FPTK/FT/FTK-JPTK in Indonesia. It is an honor for us, the Faculty of Engineering, Universitas Negeri Surabaya, to host this year Conference and convention.

On behalf of *Asosiasi Pendidikan Teknologi dan Kejuruan Indonesia (APTEKINDO)*, we would like to welcome keynote speakers, authors, delegates and participants from technology and vocational education to the city of heroes, Surabaya.

Today, we meet in Surabaya to attend a biennial agenda named APTEKINDO International Conference and Convention and National Workshop of the FPTK/FT/FTK-JPTK. Following the mandate from the 2016 APTEKINDO Convention in Medan, this year's Conference is held in Surabaya hosted by the Faculty of Engineering, Universitas Negeri Surabaya.

Ladies and Gentlemen, the theme of this year Conference is "*Revitalization of Technical and Vocational Education to Face Industrial Revolution 4.0*". The theme is chosen due to the fact that we have to quickly respond and act accordingly to the effects of the industrial revolution on vocational education. Well-programmed and structured efforts should be undertaken to ensure if technology and vocational education can produce globally competitive graduates especially for industrial revolution era.

Numbers of important topics for technology and vocational education are discussed in this Conference. The topics include Technical and Vocational Teacher Competencies, Technical and Vocational Education Curricula, Technical and Vocational Education Models, Technical and Vocational Education Evaluation, Technical and Vocational Education Policy, Public-private Partnership in Technical and Vocational Education, Technical and Vocational Education Management, Technopreneurship, and Competence Certification.

Today's Conference has several outcomes. The accepted articles will be submitted for proceeding publication indexed by Atlantic Press. Meanwhile, the rejected articles by Atlantic Press will be published in the International Proceedings with International Standard Book Number (ISBN). Moreover, the articles written in Bahasa Indonesia will be published in the National Proceedings with ISBN.

Ladies and Gentleman, this meeting must be meaningful as a venue to communicate among researchers, academics, and members of FPTK / FT / FTK-JPTK from different universities as well as from related industries. By this regular Conference and convention, we can make a strong communication network and create innovative breakthrough and substantial blueprint of different aspects such as institutional quality, field study, and curriculum. We hope that this forum plays an important role in developing technology and vocational education to face the industrial revolution 4.0.

Finally, we would like to thank the organizing committee led by Mr.Tri Wrahatnolo, M.Pd., M.T., who gave an extraordinary support. Moreover, we would like to express our appreciation and gratitude to the members of steering committee from various regions in Indonesia, delegates, SC and OC members, sponsors, as well as personal or institutional support that make this event well-organized. I apologize if there are shortcomings from my part.

Good luck with the Conference of Indonesian Association of Technology and Vocational Education, APTEKINDO 2018, and wish the best improvement for technology and vocational education in Indonesia. Thank you.

Wassalammu'alaikum Warahmatullahi Wabarakatuh

CHAIRMAN'S SPEECH

**at the International Conference and National Convention of
*Asosiasi Pendidikan Teknologi dan Kejuruan Indonesia (APTEKINDO) 2018***

Rich Palace Hotel, 11-14 July 2018

Assalammu'alaikum Warahmatullahi Wabarakatuh.

His Excellency, Rector of Universitas Negeri Surabaya,
Respectable the Head of Universities, members of Aptekindo, Keynote speakers, Authors, and fellow participants of Aptekindo Conference and convention 2018.

Alhamdulillah, no words could represent the feelings but the gratitude of the presence of Allah SWT, for His blessings, so that we can attend APTEKINDO Conference with the theme "*Revitalization of Technical and Vocational Education to Face Industrial Revolution 4.0*".

In this pleased occasion, we would like to welcome all keynote speakers, authors, and participants of the Conference to this city of heroes, the city of heroic histories, Surabaya. We would like also to welcome to APTEKINDO 2018 Conference and convention held at the Rich Palace Hotel Surabaya, 11-14 July 2018.

The theme of this year Conference is "*Revitalization of Technical and Vocational Education to Face Industrial Revolution 4.0*". This theme is chosen to respond to the development and acceleration of industrial revolution 4.0 that has been impactful in various countries. This industrial revolution has connected the utilization of machines to an internet system. To face such phenomena, Indonesian government through the Ministry of Industry has launched a program called "Making Indonesia 4.0". Currently, the government is focusing on industries that support the development of the industrial revolution such as food and beverage, electronics industry, automotive, textile and clothing, and chemical industries.

In addition, vocational education plays an important role in preparing competent and competitive human resources. That is, Faculty of Technical and Vocational Education or *Fakultas Pendidikan Teknik dan Kejuruan (FPTK)* in Indonesia aims to compile excellent ideas and vision, which later could be shared through Conferences, conventions or meetings, and also be useful to encounter industrial revolution 4.0.

Today's Conference will present competent keynote speakers in the field of technology and vocational education, who are:

1. Prof. Dr. Muhadjir Effendy, MAP. Minister of Education and Culture, Republic of Indonesia
2. Michael Freiherr Von Ungern-Sternberg, Extraordinary and Plenipotentiary Ambassador of the Federal Republic of Germany to Indonesia, ASEAN and Timor-Leste.
2. Prof. Dr. Wenny Rahayu, La Trobe University Victoria (Australia)
3. Prof. Dr. Muchlas Samani, M.Pd., Rector of Universitas Negeri Surabaya (2010-2014).

In addition, I would like to point out that there are 602 participants from 17 different universities participating in today's Conference involving:

1. Universitas Palangka Raya
2. Universitas Gorontalo
3. Universitas Islam Negeri Ar Raniry Aceh
4. Universitas Negeri Solo
5. Universitas Negeri Manado
6. Universitas Pendidikan Ganesha
7. Universitas Nusa Cendana
8. Universitas Malang
9. Universitas Negeri Jakarta
10. Universitas Negeri Padang
11. Universitas Negeri Yogyakarta
12. Universitas Pendidikan Indonesia
13. Universitas Negeri Makassar
14. Universitas Negeri Semarang
15. Universitas Negeri Medan
16. Universitas Negeri Surabaya
17. Universitas PGRI Adi Buana Surabaya

There are 491 articles submitted to this Conferences covering papers and posters. 76 articles were accepted to Atlantic Press, 156 articles published in international proceedings with ISBN, dan 129 articles published in the national proceedings with ISBN. All articles will be available for an online access through the Atlantis Press official website and through APTEKINDO 2018 website.

Today's Conference is actually held with the helps and good cooperation of various parties. Therefore, we would like to express our gratitude to the Minister of Research, Technology and Higher Education, Rector of Universitas Negeri Surabaya, keynote speakers, participants, sponsors, and other stakeholders for the supports. We also send our highest appreciation to the committees who have worked hard to succeed this Conference.

At last, we hope that all participants get benefits and knowledge that can contribute to reinforce vocational education and technology in facing the industrial revolution 4.0. WELCOME TO APTEKINDO CONFERENCE AND CONVENTION 2018, Thank you.

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Analysis of Curriculum Relevance of Vocational Welding Techniques Competence toward Industrial Practice of Vocational High School Students

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Abstract— Practice of industrial work executed as effort to increase relevance graduate competence of Vocational High School (VHS) with the needs of the workforce. Implementation of industrial work practice expected to be relevant with vocational competence at curriculum. This research aim to know: 1) recovery level of VHS student welding engineering competence during implementation of industrial work practice, and 2) relevance level of expertise competence of VHS student welding engineering associated with implementation of industrial work practice. This research is an ex post facto research, the sample of this research is 155 VHS student of welding engineering expertise in Pangkajene and Islands Regency. The instrument is a questionnaire developed based on basic competence at expertise package of VHS welding engineering. Data analysis technique using descriptive statistic. The conclusion of this research is: (1) average percentage of recovery level of welding engineering competence is 37,28% and included in fair category; and (2) competence relevance of welding engineering package interest in VHS associated with implementation of industrial work practice for Oxi-Acetylene Welding is less relevant with percentage 75,48%, manual arc welding stays in relevant category with percentage 36,77%, weld metal Inert Gas (MIG) stays in category is less relevant with percentage 66,45%, and weld tungsten Inert Gas (TIG) categorizes less relevantly with percentage 82,58%.

Keywords— Relevance Interest, Practice of Industrial Work, Welder Engineering, Student VHS.

I. INTRODUCTION

Regulation number 20 the year 2003 about National Education System section 15 reveals vocational education is secondary education drawing up student to work for certain area [1]. In the purpose of vocational education, it's required to do learning in schools and in industry, called dual system education. Amiruddin [2] gives definition that dual system education is form of organizing education and vocational expertise training that systematically and synchronously combines between education programs in schools and the world of work. Vocational education is education that prepares

students to enter to enter the work field in business and industry world

matching with requirements required by industry and provide allowance to students to develop develop their potential. Vocational education has has its own characteristics and characteristics, causing becomes distinguishment with other education systems, where curriculum developed with a purpose to producing graduate who can work in the industrial world or opens employment, corresponds to the development of science and technological with situation and condition in which they work. Expansion process of potency and character development of each student as a result from synergy between educations taking place in school, family and public. The process gives opportunity to student to develop their potency that is longer increasingly increases in attitudes (spiritual and social), knowledge, and skill necessary for their lives and community life in general, nation, and contribution at prosperity of people life. Study program programmed peculiarly to be carried out in public for example in the form of practice of industrial work. Program practice of industrial work is compiled together between schools and public (Institution dual with Industri) in order to meet the needs of student, at the same time is contribution means for work world to education expansion effort in VHS [3].

Purpose of practice of industrial work, among others: 1) to be actually dual management model of system between VHS and Institusi integrated systematically and systematical of education program in VHS and domination training program of expertise in work world; 2) provide direct job experience (real) to student for the agenda of inculcating (internalize) positive work climate orienting at caring quality of process and result of work; and 3) gives high work ethos allowance for student to enter work world in facing global work market demand [3]. Demand relevance between education worlds with work world in meaning of wide signs the need of mastered by it a number of interests which can be demonstrated when working [4]. VHS is education institute

drawing up the graduate mastering science and interest according to its field. VHS graduate insufficient only masters hard skill only, however also must master soft skill as supporter hard skill that more is able to work is productive and with quality [5]. Adaptation is done to fulfill requirement of educative participant and institution of

couple (industrial world) that interest studied link and match with requirement of work world. Most of VHS in Indonesia has program mechanical engineering skill especially welding technical because work opportunity in welder technical field leaves open wide. The labours in this area required by companys in and overseas. the Government always pushes availability of skillful welder area labour and competence readily enters work world. So form of implementation reality of policy of link and match is dual execution of system in VHS is to bear skilled man power through education in school and work world. Indium the world of work, behavior, work attitude and work character is an important requirement for workers. This is to is prepared by the school ace a simulated workplace: learning how to train and work; trained to obey the rules that apply indium the workplace; training to develop character; initiative to build relationships and socialize and train their peers and teachers [6]. Expertise interest of welding engineering in qualified in VHS that is: Oxy-Acetylene Welding (OAW), Shielded Metal Arc Welding (SMAW), Metal Inert Gas/ Metal Active Gas (MIG/MAG), and Tungsten Inert Gas (TIG). So considered necessary to express relevance welder engineering interest obtained by student in school with in industry through practice of work industry is various by couple industry. This research aim to know level of level of relevance class student interest XII welder in VHS in Pangkep South Sulawesi with activity of practice of work industry with analysing relevance interest: 1) competence obtained by welding engineering student in VHS during executing activity of work industry practice; and 2) relevance level between expertise competence of welding engineering student in VHS with activity of work industry practice.

II. METHOD

A. Research Design

This research is quantitative descriptive research that aim to describe fact and characteristics of objects and subjects are researched appropriately. This is in line with the Arikunto opinion [6] who said that descriptive research only makes a picture of what is going on to the object or region under study, then explains it in bare as it is. This research is also ex post facto where is not done control and also manipulation of research variable so that often called as non experiment research.

B. Sample Size and Sampling Technique

Population is an object or subject having certain quantity and characteristic specified by researcher to be studied and hereinafter pulled conclusion [7]. Arikunto [6] argues that the population is the whole object to be research. Population in this research is class student XI and XII of welding technique

expertise package in Pangkajene and Islands Regency as many as 282 students. Determination of population is based on the reason that industrial work practice is carried out at class student XI and XII so that the research is conducted at VHS student class XI and XII expertise package of welding engineering from three school which have followed industrial work practices. To know the size of samples to be studied then used Slovin formula. Based on sample calculation scale hence it is known that sample used as much as 155, hereinafter is applied proportional engineering of random sampling to know sample from each school.

C. Instrument

The research instrument used is a questionnaire. The questionnaire applied is questionnaire closed with high rise scale as guidance to submit questions or statement with 4 (four) alternative of answer, that is: always (SL), often (Strontium), seldom (JR), and never (TP). The subject choose the answer from fourth option that correspond to the condition experienced in the implementation of industrial work practices. OxyAcetylene Welding (OAW), Shielded Metal Arc Welding (SMAW), Metal Inert Gas/ Metal Active Gas (MIG/MAG) and Tungsten Inert Gas (TIG) instrument are developed based on basic competence and indicators in the curriculum.

D. Data Analysis

Step of descriptive analysis is started with seeking mean, median, mode, international, and distribution of categorisation. Pace gone through in usage of this analytical technique is: 1) make a questionnaire answer distribution table; 2) determines responder answer score with rule of score which has been specified, that is by counting value each question item; 3) total answer score obtained from every responder; 4) the result obtained consulted with table category; 5) calculates Mean Ideal (Mi) and Standar Deviation (SDI) and determines the category. Data trend analysis can be done by the way of determining four (4) category that is very low, low, high and very high; and 6) looks for percentage relevance of student competency of welding engineering skill package.

III. RESULTS AND DISCUSSION

A. Level of Recovery of Welding Engineering Competence in Practice of Industrial Work

Result of research shows score level of recovery of VHS student at OAW in industry stays low value 10 and highest value 32, average of 13.29, median 11, mode 10, standard deviation or deviation 5.16, variance 26.67, and range 22.

Table 1. Percentage and Recovery Criterion of OxyAcetylene Welding Competence

Item	Basic Competence	(%)	Criteria
1.	Conducting plate welding with various position plates on angular and dull joints: positions under the hands (1F & 1G) and horizontal (2F & 2G) using OAW.	34.27	Poor

Item	Basic Competence	(%)	Criteria
2.	Conducting welding of plates and pipes at angular joints: position below hand (1F) and horizontal (2F) using OAW.	32.02	Poor
3.	Conducting welding pipes with pipes on blunt connections: position under the hands that can be rotated (1G) and horizontal position that can be rotated (2G) using OAW.	30,89	Poor
4.	Conducting welding plates, plates and pipes on angular and blunt joints: using brazing and braze welding	34,76	Poor
Average		33.24	Poor

Result of the research shows the score level of recovery of VHS student at manual arc welding engineering interest in school is the lowest score of 15 and the highest value is 52, the average is 32.25, the median is 31, mode 30, standard deviation or deviation equal to 8.97, variance is 80.38, and range is 41.

Table 2. Percentage and Recovery Criterion of Manual Arc Welding Competence

Item	Basic Competence	(%)	Criteria
1.	Conducting plate welding with plate on angular joints and dull position under hand (1F & 1G), horizontal position (2F & 2G) with SMAW.	69.60	Good
2.	Conducting plate welding with pipe at hand position angle joints (1F), horizontal position (2F) and vertical position (3F) with SMAW.	52.20	Fair
3.	Carries out plate welding on vertical (3F & 3G) vertical and vertical position connections, and heads up (4F & 4G) with SMAW.	51.53	Fair
4.	Conducting plate welding on vertical (3F & 3G) angular and vertical position connections, and heads up (4F & 4G) with SMAW.	42.10	Poor
5.	Conducting pipe welding on dulled connections horizontal position (5G), position 45 ° (6G) and with SMAW.	40.56	Poor
Average		53.76	Fair

Result of the research shows that the score level of VHS student recovery on the competence of MIG welding technique in the school stays the lowest value is 16 and the highest value is 61, the average is 21.94, the median is 16, the mode is 16, deviation or deviation standard is 9.4, the variance is 88.53, and the range is 45.

Table 3. Percentage and Recovery Criterion of MIG / MAG Welding Competence

Item	Basic Competence	(%)	Criteria
1.	Conducting plates welding at corner joints and lower hand positions (1F) and horizontal (2F) positions with MIG / MAG welds.	39.27	Poor
2.	Conducting plate welding on dull hand position connection (1G) and horizontal position (2G) with MIG / MAG welding.	36.94	Poor
3.	Conducting plates welding with pipe at angular joints include: position under hand (1F) and horizontal position (2F) with MIG / MAG welding.	33.55	Poor
4.	Conducting welding of various position pipes on dulled connections under 1G and horizontal position (2G) with MIG / MAG welding.	32.74	Poor
5.	Conducting plate welding at vertical position angle connection (3F) and head top position (4F) with MIG / MAG welding.	32.90	Poor

Item	Basic Competence	(%)	Criteria
6.	Conducting plates welding of on blunt connections of vertical position (3G) and upper head position (4G) with MIG / MAG (GMAW) welding.	33.15	Poor
7.	Conducting pipe welding at horizontal angle joint connection (5F) and position 45 ° (6F) with MIG / MAG (GMAW) welding.	32.58	Poor
8.	Conducting pipe welding on dulled connections of horizontal position (5G) and position 45 ° (6G) with MIG / MAG (GMAW) welding.	33.06	Poor
Average		34.27	Poor

Result of the research shows has the score level of VHS student recovery on the competence of TIG welding technique in the school stays the lowest value is and the highest value is 40, the average is 12.73, the median is 10, the mode is 10, deviation standard or deviation is 5.43, variance is 29.51, and range is 30.

Table 4. Percentage and Recovery Criterion of TIG/WIG Weld Competence

Item	Basic Competence	(%)	Criteria
1.	Conducting welding of plates at angular joints and dulled positions under the hand (1F & 1G) horizontal position.	33.47	Poor
2.	Conducting plate welding with pipe at hand position angle joint (1F) and horizontal position (2F) with TIG / WIG weld (GTAW).	31.94	Poor
3.	Conducting pipe welding with pipe on dull hand position joints (1G) horizontal position (2G), horizontal (5G) position and 45 ° (6G) position with TIG / WIG weld (GTAW).	30.69	Poor
4.	Conducting pipe welding using a combination weld on the dull joint position of the hand (1G) and the horizontal position (2G).	32.34	Poor
Average		31.82	Poor

B. Level of Relevance Expertise Competence with Industrial Work Practice

Based on obtainable calculation of statistical about relevance Oxy-Acetylene welding with execution work industry practice. The data is presented at Table 5.

Table 5. Level of Relevance of Oksy Acetylene Welding with the Implementation of Industrial Work Practices

Item	Category	Interval	Frequency	%
1.	Less Relevant	< 7	117	75.48
2.	Quite Relevan	7 - 10	27	17.42
3.	Relevant	11 - 13	10	6.45
4.	Very Relevant	> 13	1	0.65
Total			155	100.00

Based on obtainable calculation of statistical about relevance manual arc welding with execution of work industry practice. The data is presented at Table 6.

Table 6. Level of Relevance Manual Arc Welding with Execution of Industrial Work Practice

Item	Category	Interval	Frequency	%
1.	Less Relevant	< 7	12	7.74
2.	Quite Relevan	7 - 10	49	31.61
3.	Relevant	11 - 13	57	36.77
4.	Very Relevant	> 13	37	23.87
Total			155	100.00

Based on obtainable calculation of statistical about relevance weld MIG with execution of practice of work industry. The data is presented at Table 7.

Table 7. Level of Relevance MIG Welding with Execution of Industrial Work Practice

Item	Category	Interval	Frequency	%
1.	Less Relevant	< 4	103	66.45
2.	Quite Relevant	4 - 5	32	20.65
3.	Relevant	6 - 7	15	9.68
4.	Very Relevant	> 7	5	3.23
Total			155	100.00

Based on obtainable calculation of statistical about relevance weld TIG with execution of practice of work industry. The data is presented at Table 8.

Table 8. Level of Relevance TIG Welding with Execution of Industrial Work Practice

Item	Category	Interval	Frequency	%
1.	Less Relevant	< 4	128	82.58
2.	Quite Relevant	4 - 5	15	9.68
3.	Relevant	6 - 7	8	5.16
4.	Very Relevant	> 7	4	2.58
Total			155	100.00

Based on result of research is obtained by data that level of recovery of interest during executing practice of work industry expertise package student of welder engineering in VHS for weld interest OAW 33.24%, SMAW 53.76%, MIG/MAG 34.27%, and TIG 37.28%. Interest obtained by student during practice of work industry has not fully accommodate all interests of the curriculum in VHS. Student obtains performance and knowledge in school in the form of theory then obtains skill in industrial world, but has not all obtained by student in execution of practice of work industry. Result of analysis also indicates that relevance weld interest OAW with execution of practice of work industry stays in category is less relevantly with percentage 75.48%, relevance SWAW with execution of practice of work industry stays in relevant category with percentage 36.77%, relevance weld interest MIG/MAG with execution of practice of work industry stays in category is less relevantly with percentage 66.45%, and relevance weld interest TIG with execution of practice of work industry stays in category is less relevantly with percentage 82.58%. Based on the data it is known that not all interests is practiced by student during execution of practice of work industry. Above the thing unmatched to purpose of dual program of system, namely to reach domination of performance of certain expertise, as which expressed that education of double system or practical is a form of the management of education of vocational expertise, which synthesize the programmatically and synchronously in VHS and domination program of expertise gotten through working directly at relevant work area, directional to reach domination of performance of expertise [9]. Practice of industrial work is study program that is must be done by every educative peseta in work world especially for student VHS [10] [11]. Execution

of practice of industrial work ought to as according to curriculum VHS related to interest which must be mastered by educative participant. Vocational Interest basis and interest of welder engineering having the character of practice, executed in school and established and development at industrial world in the form of practice of work industry. Industrial world as institution of couple perform [a] agreement with VHS either in writing and also oral to cooperate in execution of practice of work industry. Theory allowance and practice of basis which have been owned student during in school can be application in industrial world. The thing is meant that each student to obtain experience of reality to execute various work types as according to study program that is on the market by school to industrial world. Every student must experience every activity done in industrial world at the time of executing practice of work industry. Daily note can express program performance of learning which on the market by school. Just such interest which have been done and which has not or might not be given to student during practice of work industry. Many knowable things from note of student, including in it tuition intensity by

instructor, job description, office hours given, time for resting, situation of work etcetera. Student interest VHS would as according to work world interest if industrial world give training to work to student. In line with practice of work industry that is a workforce having level of skill knowledge and work ethos as according to employment demand. Therefore, both parties involves and responsible in forming professional graduate and ready for use in industrial world. Practice of work industry basically is property and responsibility with between education institutes and institution of the couple. Planning of practice of work industry which has been compiled in syllabus, has not entirely can be done in industry to causes student cannot add or increases experience as according to the interest. Limitation of supporting facilities owned by industry is one of resistance causing student cannot practice interest which ought to be done. This thing is not unmatched to purpose of execution of practice of industrial work that is giving practical experiences to participant so that result of training increases wide [12].

IV. CONCLUSION

Based on data analysis can can be concluded that : (a) Level of recovery of interest during executing practice of work industry expertise package student of welder engineering in VHS for OAW 33.24%, SMAW 53.76%, MIG/MAG 34.27%, and TIG 37.28%. So thereby execution practiced work industry expertise interest of student welder engineering VHS only reach percentage average of recovery of weld engineering interest 37.28% and included in unfavourable category. (b) Relevance expertise package student interest of welder engineering in VHS with execution of practice of work industry for OAW stays at category is less relevantly with percentage 75.48%, SMAW stays in relevant category with percentage 36.77%, MIG/MAG stays in category is less relevantly with percentage 66.45%, and weld TIG categorizes less relevantly with percentage 82.58%.

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