

ISSN: 2301-7147



ICVET
4th International Conference
on Vocational Education and Training

PROCEEDINGS

4th International Conference
on Vocational Education and Training 2016



**“Strengthening TVET in
ASEAN Economic Community”**

Yogyakarta State University, Indonesia
September 15, 2016



THIESS



RCP
Regional Cooperation Platform



**4th International Conference
on Vocational Education and Training 2016**

Yogyakarta State University, Indonesia
www.icvet.uny.ac.id



**PROCEEDINGS
4th INTERNATIONAL CONFERENCE ON
VOCATIONAL EDUCATION AND TRAINING (ICVET)**

**GRADUATE PROGRAM COLABORATION WITH
ENGINEERING FACULTY, YOGYAKARTA STATE UNIVERSITY
September 15, 2016**

STRENGTHENING TVET IN ASEAN ECONOMIC COMUNITY

ISSN: 2301-7147

I. Article

II. Title

III. Achmad Arifin, et.al.

Copyright Act protected photocopied or reproduced by
any means, whole or in part without permission of the
publisher of this book is immoral and against the law

Title:

STRENGTHENING TVET IN ASEAN ECONOMIC COMUNITY

Editors:

Achmad Arifin
Surono

Layout:

Achmad Arifin

Cover Designer:

Muslikhin

Strengthening Technical Vocational Education and Training (TVET) in ASEAN Economic Community (AEC)

Welcome to the 4th annual INTERNATIONAL CONFERENCE ON VOCATIONAL EDUCATION AND TRAINING (ICVET 2016)

This proceeding compiles all abstracts and fullpapers from the invited speakers and participants presenter in the 4th International Conference on Vocational Education and Training (ICVET) held by the Graduate School and Faculty of Engineering Yogyakarta State University on 15 September 2016 at Sheraton Mustika Hotel Yogyakarta.

ASEAN Economic Community (AEC) has prevailed at the end of 2015. Regarding this issue, it has some consequences. One of them is the open flow of products, services, and human resources across ASEAN countries. In addition, ASEAN members can freely sell their industrial products. In other words, this policy can increase the degree of products competition among those countries. The main theme of this conference is “Strengthening Technical Vocational Education and Training (TVET) in ASEAN Economic Community (AEC)”. Four sub themes are covered in this conference: 1) Establishing the policy of Quality Assurance in TVET to prepare Regional Qualification Framework, 2) The Role of TVET to Fulfill National Economic Growth and Workforce in AEC Era 3) Contribution of Informal Sectors and Skills Village in AEC, 4) Empowering Vocational Teacher Education Institution in AEC.

This conference provides the opportunity for teachers/lecturers, educational practitioners, industrial practitioners, and the others stakeholders as well to share knowledge, experiences, and research findings relevant in contributing ideas and considerations for the implementation of VET policy-making in order to strengthen Technical Vocational Education and Training (TVET) in ASEAN Economic Community.

The committee would like to thank to those who have provided assistance without which it is impossible to finish this proceeding. Further comments and suggestions on the improvement of this proceeding would be highly appreciated.

CHAIRPERSON SPEECH

Rector of Yogyakarta State University,
Prof. Dr. Pascal Marquet, University of Strasbourg, France
Tony Borkett, Theiss, Australia
Dr. Michael Grosch, Karlsruhe Institute of Technology, Germany
Prof. Soenarto, Ph.D., Yogyakarta State University, Indonesia

Distinguished guests, Participants, Ladies and Gentlements,

It gives me great pleasure to extend to you all a very warm welcome to the 4th International Conference on Vocational Education and Training (ICVET) with the theme “Strengthening Technical Vocational Education and Training (TVET) in ASEAN Economic Community (AEC)” held in Sheraton Mustika Hotel today.

Consequences of the implementation of ASEAN Economic Community which came into force in late 2015 are the open flow of products, services, and human resources across the ASEAN countries. Another consequence is there are many employment opportunities among ASEAN countries, however, when one side can enlarge employment opportunities, it can threaten less skilled human resources’ position in a particular country.

The successful fulfillment of skilled human resources is highly dependent on vocational education. Reputable vocational education certainly is supported by professional teachers. Based on this fact, the strengthening of vocational teacher education institutions is considered urgent since at this time vocational teacher education institutions have not set up teachers according to expertise program in vocational education. This conference offers an opportunity for participants to share best practices, concepts, and experiences in Strengthening TVET in AEC.

Our technical program is rich and varied with 1 keynote speaker and 4 invited speakers. 170 participants in this conference that involving 4 groups: Graduate School Students, College/University Teachers, Secondary School Teachers, Vocational High School Teachers. A total of thirty papers will be presented during the parallel session.

As a conference chair of the 4th ICVET 2016, I know that the success of the conference ultimately depends on the many people who have worked with us in planning and organizing both the technical program and supporting social arrangements. Recognition should go to the organizing committee members who have all worked extremely hard for the conference programs.

I hope that this conference will give benefit to the students, academic staffs and vocational teachers.

Thank you for your attention. I wish you a very fruitful conference.

Dr. Widarto
Chairperson of 4th ICVET 2016
Dean of Engineering Faculty
Yogyakarta State University

RECTOR YOGYAKARTA STATE UNIVERSITY WELCOME SPEECH

Prof. Dr. Intan Achmad, Directorate General of Learning and Student Affairs, Minister of Research, Technology and Higher Education, Indonesia

Prof. Dr. Pascal Marquet, University of Strasbourg, France

Tony Borkett, Theiss, Australia

Dr. Michael Grosch, Karlsruhe Institute of Technology, Germany

Prof. Soenarto, Ph.D., Yogyakarta State University, Indonesia

Distinguished guests, Participants, Ladies and Gentlemen's,

I would like to say welcome you warmly to the 4th International Conference on Vocational Education and Training (ICVET) with the theme of "Strengthening Technical Vocational Education and Training (TVET) in ASEAN Economic Community (AEC)" held in Sheraton Mustika Hotel today.

ASEAN Economic Community (AEC) has prevailed at the end of 2015. Regarding this issue, it has some consequences. One of them is the open flow of products, services, and human resources across ASEAN countries. In addition, ASEAN members can freely sell their industrial products. In other words, this policy can increase the degree of products competition among those countries. Service industry will take part in all ASEAN countries without boundaries. Others consequences are several employment opportunities among ASEAN countries. However, when one side can enlarge employment, opportunities, it can threaten less skilled human resources position in a particular country.

To confront the invasion of foreign labor from several countries, it is necessary to put up candidates who have qualified manpower that can be accepted in other countries. In that case, it is necessary for educational institutions at national, regional, and international level to have assured quality. Also, based on the demands of the regional labor qualification, it is expected that vocational education graduates can implement quality assurance in accordance with the framework of regional labor qualification.

Vocational education aims to produce skilled human resources to meet the demands. One of the criteria of successful fulfillment of skilled human resources is depended on vocational education. Vocational education certainly is supported by professional teachers. Based on this fact, the strengthening of vocational teacher education institutions is considered urgent since at this time vocational teacher education institutions have not set up teachers according to expertise program in vocational education.

We know that the success of the conference ultimately depends on the people who have worked with us in planning and organizing both the technical program and supporting social arrangements. Recognition should go to the organizing committee members who have all worked extremely hard for the conference programs. I hope that this conference will give benefits to the students, academic staffs, industrial practices and vocational teachers.

Thank you for your attention. I wish you a very fruitful conference.

Prof. Dr. Rochmat Wahab, M.A
Rector of Yogyakarta State University

CONTENTS

Title	i
Preface	iv
Chairperson Speech	v
Rector Welcome Speech	vi
Content	vii

Invited Speakers

DEVELOPING A COMPETENCY STANDARD FOR TVET TEACHER EDUCATION IN ASEAN COUNTRIES

Michael Grosch.....	1-1
---------------------	-----

THE ROLE OF THE PRIVATE SECTOR IN VOCATIONAL EDUCATION

Anthony Borkett.....	1-9
----------------------	-----

THE ROLE OF TVET FOR IMPROVING ECONOMIC GROWTH AND LABOR IN ASEAN ECONOMIC COMMUNITY ERA

Soenarto.....	1-14
---------------	------

DIGITAL MEDIA RESEARCH IN EDUCATION: THE USEFULNESS OF THE INSTRUMENTAL CONFLICTS THEORY

P. Marquet.....	1-28
-----------------	------

Paper Presenters

Theme 1: Establishing the policy of Quality Assurance in TVET to prepare Regional Qualification Framework

THE QUALITY OF STUDENTS' SOCIAL COMPETENCY OF EDUCATIONAL EXPERIENCE PROGRAM IN VOCATIONAL SECONDARY SCHOOLS

Suparman, Galeh NIPP, Dwi W	2-1
-----------------------------------	-----

CURRICULUM DEVELOPMENT OF VOCATIONAL EDUCATION FOR ELECTRICAL ENGINEERING REFERS TO THE NATIONAL QUALIFICATION FRAMEWORK FOR STANDARIZING STUDENT COMPETENCE'S

M. Khairudin, R. Asnawi, Herlambang S.P, Totok Heru TM, A. Candra, T. Sukisno.....	2-7
--	-----

EXPLORING THE MALAYSIAN QCLASSIC PRACTICALITY

Sohimi, N. E, Affandi, H.M, Fadzil, H., Mohd Sattar, R.....	2-16
---	------

VOCATIONAL SCHOOL QUALITY IMPROVEMENT BY STRATEGIC PARTNERSHIP WITH INDUSTRIAL SIDE

Zainal Arifin.....	2-24
--------------------	------

THE QUALITY OF ELECTRONIC APPLICATION COMPETITION IN VOCATIONAL HIGH SCHOOL BASED ON HIGHER ORDER THINKING SKILLS

Muslikhin, Muh. Munir, Poncowali Pranoto.....	2-30
---	------

Theme 2: The Role TVET to fulfill National Economic Growth and Workforce in AEC Era

LABOR PRODUCTIVITY UP WITH DEBURRING TOOL IN GEAR PROCESSING, A CASE OF STUDENT INDUSTRIAL INTERNSHIP PROGRAM

Gamawan Ananto, Aji Yudistira 3-1

DEVELOPMENT OF CONTEXTUAL LEARNING TO INCREASE THE STUDENT KNOWLEDGE OF PILES IN FOUNDATION ENGINEERING

Nurlita Pertiwi 3-6

MOBILE LEARNING TRENDS AND CHALLENGES FOR VOCATIONAL EDUCATION IN INDONESIA

Ridwan Daud Mahande, Herman Dwi Surjono 3-12

THE EMPOWERMENT OF VOCATIONAL EDUCATION AND IT'S CONTRIBUTION TO NATIONAL ECONOMIC GROWTH

Sutarto Hp 3-20

STRENGTHENING COMMUNITY COLLEGE TO IMPROVE GROSS ENROLMENT RATIO (GER) OF HIGHER EDUCATION

Sunaryo Soenarto 3-28

DESIGN EXPERIENTIAL LEARNING ON COMPETENCE BASED TRAINING COMPUTER ENGINEERING AND NETWORKS IN VOCATIONAL HIGH SCHOOL

Riana T. Mangesa, Dyah D. Andayani 3-34

MADRASAH ALIYAH ANALYSIS FOR THE IMPROVEMENT OF VOCATIONAL GRADUATES' COMPETITIVENESS TO FACE GLOBAL WORKFORCE

Adhan Efendi, Jeng Iswari 3-40

VOCATIONAL STUDENTS' SELF-AWARENESS AND LEARNING NEEDS TO SURVIVE AND THRIVE IN THEIR JOB-LIFE

Adi Suryani, Usman Arief, Tri Widyastuti 3-47

THE FACTORS THAT AFFECTS THE SUCCESS OF ENTREPRENEURSHIP OF FASHION PROGRAM AT YOGYAKARTA

Ma'rifatun Nashikhah, Moch. Bruri Triyono 3-57

IMPROVING THE COMPETENCE OF VOCATIONAL HIGH SCHOOL GRADUATES BY TEACHING FACTORY AND TECHNOPARK

Sanatang 3-64

Theme 3: Informal Sectors and Skills Village as Drives in AEC

VOCATIONAL STUDENT'S SKILLS ENHANCEMENT THROUGH EMPOWERING LOCAL EXCELLENCE IN DEALING ASEAN ECONOMIC COMMUNITY (AEC)

Hendra Jaya, Yasser A. Djawad, Ilham Thaief 4-1

BIG BANG MODEL STRATEGY FOR ACCELERATION OF LOCAL GOVERNMENT READINESS FINANCIAL ACCOUNTING SYSTEM BASED ACCRUAL IN THE DISTRICT KARANGANYAR

Siti Nurlaela, Sri Hartono, Istiqomah 4-9

VOCATIONAL VILLAGE INITIATIVES FOR COMMUNITY SKILL DEVELOPMENT BASED ON LOCAL RESOURCES IN AEC

Suhendar, Siswo Wardoyo, Syadeli Hanafi..... 4-21

STRUGGLING CREATIVE HOME INDUSTRY ON IMPLEMENTATION OF MODIFIED BEAN BREAKER TOOLS-MULTICULTURAL CHARACTER BUILDING BASES OF MERAPI VOLCANIC DISASTER

Zainur Rofiq, RA. Rahmi Dipayanti Andayani, Das Salirawati..... 4-28

THE WORKERS COMPETITIVENES OF SMALL BUSINESS ENTERPRISE TO FACE ASEAN ECONOMIC COMUNITY AGREEMENT

Yasrizal..... 4-33

Theme 4: Empowering Vocational Teacher Education Institution in AEC

VOCATIONAL TEACHER ROLE IN PREPARING STUDENTS IN THE ASEAN ECONOMIC COMMUNITY ERA

Hasanah, Muhammad Yahya, Muhammad Nasir Malik..... 5-1

TEACHERS QUALIFICATION FOR VOCATIONAL EDUCATION AND TRAINING PROGRAM IN HEAVY EQUIPMENT SECTORS

Moch. Bruri Triyono, Achmad Arifin, Nur Hasanah..... 5-8

INFORMATION SYSTEM MODEL OF SELF-EVALUATION EFFORTS TOWARDS WORLD CLASS TEACHERS' INSTITUTION OF VOCATIONAL EDUCATION AND TRAINING

Edy Supriyadi 5-15

EMPOWERING INDONESIA's TVET TEACHER EDUCATION IN ASEAN ECONOMIC COMMUNITY ERA

Lutfiyah Hidayati..... 5-22

THE CHALLENGES OF MUSIC TEACHER COMPETENCIES FOR VOCATIONAL SCHOOLS TO FULFILL CREATIVE ECONOMY INDUSTRY DEMANDS

Ayu Niza Machfauzia 5-27

INDONESIAN VOCATIONAL TEACHERS EDUCATION DEVELOPMENT

Putu Sudira..... 5-36

DEVELOPING A COMPETENCY STANDARD FOR TVET TEACHER EDUCATION IN ASEAN COUNTRIES

Michael Grosch

Karlsruhe Institute of Technology, Institute of General and Vocational Education
e-mail: michael.grosch@kit.edu

ABSTRACT

Most ASEAN member countries are currently facing a lack of skilled labor which is jeopardizing their further economic development. To tackle this issue, it is crucial to improve the Technical and Vocational Education and Training (TVET) system, in which the quality of TVET teachers constitutes a main key factor. Establishing an International. A mutual TVET Teacher Master program and degree for ASEAN countries can enhance TVET teachers' competence in the ASEAN community. The paper presents a competency framework for TVET teachers in ASEAN countries that was developed by a focus group from five ASEAN countries during two workshops from 2015 to 2016, which can be used as a blueprint for setting up such an international TVET Master program for the ASEAN community. The paper also elaborates, which further steps need to be conducted to set it into practice.

Keywords: TVET teacher training, competency standard, competency-based education, ASEAN

I. INTRODUCTION

As many other nations, also ASEAN member countries are struggling with a lack of skilled labor which is slowing down economic growth and jeopardizing their further economic and social development. One of the key issues to tackle this challenge is the development of Technical and Vocational Education and Training (TVET).

Regarding educational quality, the improvement of teachers' competence is seen as one of the most crucial areas of action (Hattie, 2008). Especially in the area of TVET, the quality and qualification of university and college teachers are intensely discussed topics and considered to be the most important success factor but also issue for delivering TVET (Lipsmeier, 2013, p.; RCP, 2011, p. 41). This includes the teachers' ability to develop and follow modern curricula and to apply appropriate teaching and learning methods. The related competencies need to be delivered to them during their initial training at the universities or other institutions (UNESCO/UNEVOC 2009, p. 11). Proper teacher training will enable them to fulfil the continuously changing requirements of modern TVET systems and the world of work in the ASEAN community, which, as one of the most dynamic regions in the

world, is undergoing rapid and fundamental changes in society, economy and technology.

The most important task of TVET Teacher Training is to enable the teachers to prepare their students for the modern society and world of work not only for today but also for tomorrow. Hence, they need to relate teaching and learning to this world. To do so, they need to understand and apply modern methods and approaches of TVET education, such as Competency Based Training and Education (CBET) and outcomes-based education. Related to that, teachers also need to shift their teaching from teacher to student-centered teaching and learning and their role from instructors and lecturers to facilitators and moderators of the learning process.

TVET teachers not only need to prepare their students but also themselves for a constantly changing environment. As for example, currently all ASEAN countries are synchronizing their educational systems based on competency and outcomes-based education and are implementing, related competency standards and assessment into their educational systems. Teachers need to be able not only to participate but also to proactively promote and shape this process. The ASEAN community and the related reforms, such as creating mutual competency frameworks or increasing the mobility of

students and the workforce, requires new competencies of teachers which need to be defined in mutual standards for TVET teachers and university programs for TVET teacher education.

To contribute to this process a draft for a mutual TVET Teacher competency standard was developed, which is presented in this paper. It can be the fundament of an International TVET Teacher Master program and degree for ASEAN countries.

II. METHODS

To develop the competency framework draft, a modified focus group and DACUM (“Develop a Curriculum”) method approach was applied. The participating experts were 15 lecturers from universities and national institutes who are planning, conducting, developing and managing TVET teacher education and training in their respective countries, namely Cambodia, Indonesia, Laos, Myanmar and Vietnam. The development of the competency framework was a work task conducted as part of a series of workshops of the RCP Network project RECOTVET, provided by the Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ), a German development agency.

The modified focus group DACUM workshop method was based on a refined methodology of a previous project to develop an in-company trainer standard for ASEAN countries by the author and other experts from 2014 to 2015 (Grosch & Fischer, 2015). As the target was not to develop a curriculum to train a vocation (the original DACUM purpose) but a competency standard for academic program to educate TVET teachers, it deviates from the traditional DACUM method by including additional elements, such as input sessions, group work elements and field trips. It didn’t include the final steps of DACUM to draft a curriculum. Overall, two focus group workshops, each for 2 weeks were conducted on October 2015 and March/April 2016. They included a cascading series of Brainstorming, Active Structuring and Meta Plan methods, enriched by input sessions of the moderator (the author of this paper), in which the participants were introduced into relevant

theoretical approaches and methods, such as Competency Based Education and Training (CBET; GIZ, 2011), different competency models, standards from other countries and regions, modern trends and challenges in TVET teacher education, an introduction into student-centered teaching-learning and field trips to the industry. The enrichment of the process, using these inputs intended to inspire the focus group with new ideas, so the competency standard will not just reflect the current mind set and state of education in the participants’ countries, but furthermore opening them to new ideas to develop a TVET teacher standard for the future. I.e. including competencies in the standard draft, which seem necessary to cope with future challenges and requirements of modern TVET teacher education. It can be seen as an equivalent to a gap analysis in a classical DACUM session.

To develop the competency standard draft, the ASK competency model (“Attitude, Skills and Knowledge”) was applied, as one of the most common and accepted frameworks.

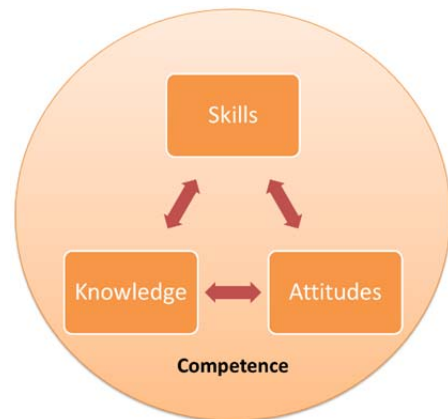


Fig. 1: ASK-Competency Model

There are also other popular models, e.g. the model used in the European Union to define the European Qualification Framework EQF (European Communities, 2008). However, this model doesn’t include the section of attitudes. As this area was seen as very essential for competency development by the group, it was decided to use the ASK-model to describe the competency standard.

III. RESULT AND DISCUSSION

3.1. The Competency Framework Draft

To prepare the development of the competency standard draft, firstly several group work sessions by country were conducted at the beginning of the workshop to determine the current state of TVET teacher education in the participating five countries. This process revealed, that the largest share of the TVET teachers are graduating from

Bachelor Degree programs specifically tailored for TVET teachers at specialized faculties or institutes for TVET teacher education inside universities or national training institutes. The group work process also revealed, that there is an overall similar lack of certain competencies in all countries, such as:

1. the inability to cooperate with the industry in educational programs
2. a lack of competencies to apply modern TVET methods and concepts, especially CBET-related approaches
3. a lack of student-centered teaching-learning methods.

To close this gap, the group agreed that these competencies should be included in a mutual competency standard and particularly fostered in a Master program. Such a Master program would constitute a

next, higher next level in the status quo of TVET teacher education of the participating countries and their national qualification frameworks, where a Bachelor degree is the common standard. Referring to the ASEAN Qualification Reference Framework AQR (ASEAN, 2013), it should be located on level seven.

As mentioned in the methods section, the process of structuring the draft followed the ASK-model and describes the core competencies of a TVET teacher in terms of what a TVET teacher should be able to do and which related skills, knowledge and attitudes are needed.

The focus group work resulted in a competency framework draft, which consists of three modules, containing overall 15 competencies as follows:

Module I: Planning and Preparation: six competencies

Module II: Implementation: six competencies

Module III: Evaluation: three competencies

The following table describes the three modules, including all relevant competencies. Below the competencies, relevant related knowledge, skills and attitudes are listed as examples:

Table 1: Module I, TVET teacher competency profile draft

Module I: Planning and Preparation		
A TVET Teacher is able to:		
1. Identify students' background		
Knowledge	Skills	Attitudes
- psychological	- information collection and analysis	- willingness to communicate with students
- cultural	- interpersonal skills	- accepting individual differences of students
- administrative	- interview skills	- empathy to understand students' situation
- social		- respecting students' ideas and background
2. Design a lesson plan		
Knowledge	Skills	Attitudes
- teaching schedule	- classroom management	- creativity and flexibility
- number of students	- using IT, computers and software	- pragmatism
- chronology of subjects	- choosing suitable curriculum and syllabus	- diligence and carefulness
- location and environment	- selecting appropriate content	- self-discipline to prepare in time
- learning requirements	- time management	
- frame curriculum		

3. Prepare, design and choose learning content		
Knowledge	Skills	Attitudes
- subject expertise	- material searching	- discipline to follow requirements and regulations
- up to date subject content	- communication	- cooperativeness in designing teaching strategy and methods
- stakeholder requirements	- applying standards and setting them into practice	
- knowledge on standards	- choosing appropriate teaching content	
4. Design suitable teaching strategies and methods		
Knowledge	Skills	Attitudes
- teaching methodology;	- setting theory into practice	- Willingness to change teaching strategies and methods
- learning psychology;	- teaching methods	
- subject characteristics	- communication	
	- selecting appropriate strategies and methods	
5. Choose and prepare suitable material and media		
Knowledge	Skills	Attitudes
- media theory	- operating media hard- and software	- willingness to change teaching strategies and methods
- media technology	- classroom management	- creativity and flexibility
- media psychology	- selecting appropriate instruments	
- instruments and tools	- presentation	
- media design		
6. Design assessment strategies and instruments		
Knowledge	Skills	Attitudes
- subject characteristics	- identifying students' competency levels	- creativity in designing assessment strategies and instruments
- assessment methods and principles	- using statistical analysis and tools	
- students' levels	- designing assessments	
- statistics		

Table 2: Module II, TVET teacher competency profile draft

Module II: Implementation		
A TVET Teacher is able to...		
7. Motivate students in the learning process		
Knowledge	Skills	Attitudes
- methods of motivation	- verbally addressing students	- Respect students' individual characteristics
- psychology	- sensing characteristics of students	- empathy concerning students' conditions
- social relations	- using different motivation methods	- willingness to share problems with students
- students' interests and background	- using media for motivation	- passion to encourage students
	- using body language	
	- ability to show the students the benefit of learning for their own life	
8. Manage class activities		
Knowledge	Skills	Attitudes
- leadership techniques	- skills to control the class	- creativity to improve class atmosphere
- management and administration	- leadership skills	- flexibility between friendliness and seriousness
- group work	- time management	
	- class handling	

techniques	- facilitation	- disciplined but flexible during time management
- ways to control the class	- collaboration	- fairness with students during class
	- organization	- objectivity in valuing students' activities and behavior in class
9. Communicate with students, colleagues and other stakeholders		
Knowledge	Skills	Attitudes
- national, language, cultural, individual etc. background of students	- interactive and interpersonal skills	- patience in initiating communication with students, colleagues and other stakeholders
- theory and practice of communication in specific situations	- communicative skills	- professional ability to perform constructive communication
	- team building skills	- listening politely and attentively during communication
10. Apply teaching strategies and methods		
Knowledge	Skills	Attitudes
- creating good syllabus	- adapting methods according to situation	- creatively choosing the best teaching method
- teaching-learning strategies	- using teaching techniques	- innovative in finding suitable teaching method
- specific teaching methods and their use	- teaching skills	- flexibility in choosing the best teaching method in different conditions
- student-centered teaching and learning	- using variety of teaching methods; adaptive skills	
11. Connect students with the working world		
Knowledge	Skills	Attitudes
- work place training	- fostering students' employability	- taking responsibility in providing real world experience
- internship possibilities in companies	- team work	- discipline to follow working world demands
- experiential knowledge about real world (work places etc.)	- facilitating internships in suitable companies	- pragmatism in providing real work examples
		- creativity in designing real work assignments
12. Use suitable material and media		
Knowledge	Skills	Attitudes
- how to use materials and media	- media usage	- creativity and precision in choosing suitable media and material
- using teaching media	- combining different media and materials	
- technological knowledge	- applying technological skills	

Table 3: Module III, TVET teacher competency profile draft

Module III: Evaluation		
A TVET Teacher is able to...		
13. Assess students' learning outcomes		
Knowledge	Skills	Attitudes
- assessment techniques	- applying quantitative and qualitative analysis information and data	- reliability and objectivity in designing and conducting assessment tasks
- assessment methods	- applying assessment techniques	- precision when designing assessment criteria
- assessment criteria	- designing assessment criteria	- sense of responsibility and empathy when giving feedback and grading
- principles and methods of competency based and outcomes-based assessment	- using statistical and other software	
	- apply CBET assessment methods	
14. Provide and get feedback from students		
Knowledge	Skills	Attitudes
- information and data collection methods	- choosing the right data collection technique	- transparency when giving feedback
- ways of analyzing problems	- getting information from students	- respecting students' ideas
- ways of problem solving	- interpreting information from students	- fairness with all students
- consulting techniques	- observing and interpreting students' behavior	- encouraging self-improvement of students
	- observing and interpreting own behavior	- patience
	- encouraging students to give feedback	- Willingness to accept criticism from students and to change behavior if necessary
		- Self-criticism
15. Conduct an evaluation process		
Knowledge	Skills	Attitudes
- peer review evaluation	- applying standards	- willingness to update own assessment knowledge and skills
- self-evaluation	- conducting research	
- quality assurance	- communication	- creativity in designing assessment methods
- action research methods	- creating instruments for assessment	- carefully analyzing results
	- analyzing teaching process	- willingness to give individual feedback punctually / in time
	- identifying problems and find solutions	
	- self-introspection	

3.2. Discussion

Regarding the methods and process of developing the competency framework, it turned out to be fundamental for the success of both of the focus group workshops, that all participants encompass the underlying definitions, concepts, theories and models, such as the theory of competency, competency-based education, educational standards, outcome-oriented education etc. Concerning the applied ASK Competency Model, in the beginning of the

process it proved to be hard for the participants to understand the different terms and their meaning, e.g. the difference between knowledge and skills and the meaning of attitudes. As there is also a general confusion between the different pedagogical traditions regarding some of the terms and concepts, for example concerning the definition of "competency" and "skill", these key terms needed to be made understood in detail before and during the development of the competency

framework, to create a mutual knowledge base. Hence, a large share of time was spent to clarify the meaning of the related terms and models. For the further transformation of the competency draft into a standard and a curriculum, these terms and their definition should be included into the standard in the form of a glossary. The process of distinguishing between the different terms and understanding their meaning not only helped the participants to understand their meaning, but also contributed in clarifying the content and relevance of the competency standard draft. Especially while working on the attitudes section all participants became aware of the immense importance of having proper attitudes to acquire pedagogical competencies.

The TVET teacher competency standard in the version which was presented above is still a draft and needs more elaboration and finalization during a further process. While the list of competencies and their wording already seems elaborated, the sub-sections knowledge, skills and attitude need to be further revised concerning their consistency and comprehensiveness, e.g. to clarify interferences between the categories “skills” and “knowledge”. During potential follow-up sessions, also more stakeholders, especially from the industry and from the educational administrative level need to be involved, in addition to the group of university lecturers who participated in the previous focus group workshops. Beyond, also ASEAN participants from other than the five countries which already participated need to be included, if the framework should target TVET teacher training in all ASEAN countries.

As the current competency framework draft only includes pedagogical competencies, also the area of professional competencies needs to be explored, as all TVET teachers in the target countries are usually teaching one major subject or “vocational discipline”. The pedagogical competencies need to be reflected based on this vocational or professional background, e.g. to explore if they are didactically appropriate, efficient etc. If any concerns

regarding its suitability are occurring, the pedagogical standard needs to be modified and adapted, e.g. by splitting in up into a core competency standard for all professions and industries and several specific standards for different vocations.

The developed competency framework is based on the ASK-model and hence belongs to the group of “horizontal” frameworks which generally distinguish between different competencies but not include the different levels of these competencies as a “vertical” dimension. However, the overall competency level of the whole standard was discussed and set to be on the Master level by the experts’ group. In the further process, the vertical competency structure can be elaborated in detail, e.g. which of the listed competencies are already covered to which level on the already existing Bachelor level programs. Later on, e.g. by applying the Dreyfus and Dreyfus (1980) Model of Skill Acquisition or a similar model, the vertical dimension can be drafted for each competency, including skills, knowledge and attitudes in the further process, which will finally lead to a two-dimensional competency matrix. This matrix can be used to develop a Master curriculum that follows up on the Bachelor level competencies of TVET teacher program students and matches with the ASEAN Qualification Reference Framework AQRF (ASEAN, 2013).

The focus group process and the included activities revealed that all three competency modules of the framework draft and most of the included competencies are already part of the Bachelor-level TVET teacher curricula in the participants’ countries in one way or another. However, the general approach of the framework, which reveals itself in the details, such as the relevant skills, knowledge and attitude is essentially different and includes a shift from traditional to modern approaches of student-centered teaching and learning and CBET in all three modules. Some of the competencies also are not included in the curricula yet, and need to be particularly promoted, among others especially competency 11. “connect students with the working world”.

IV. CONCLUSION

The developed TVET teacher competency standard could be a useful draft to further synchronize and to move TVET Teacher education in the ASEAN community to the next level. It is recommended to finalize the competency standard in further focus groups, including more stakeholders and ASEAN countries and to consider establishing an international TVET master program using a finalized version of the standard draft. During this process, the standard needs to be translated into a frame curriculum, containing further elements, such as: teaching and learning topics, length and credit points, learning places, additional modules, especially pre-service teacher training, internships, entry requirements, graduation requirements, assessment criteria, possible types of conducting (full time study, separate pedagogical program or integrated with professional vocation, program language etc.). During all possible activities, the main philosophy, areas of action and challenges need to be kept in focus by all participants, such as CBET- and outcome-orientation, the right balance between professional / vocational competencies in the field of teaching and pedagogical competencies, connecting to the industry (dual or cooperative education), high quality pre-service teacher training and focus on the ASEAN process/internationalization. Later on, one or more universities or national institutes need to be convinced to establish the program. Funding donors, such as SEAMEO, ADB or other resources need to be acquired.

The program should be developed and/or monitored by institutions which got experience in this field and were already involved in the process, such as Karlsruhe Institute of Technology (KIT), Germany and International Consultants for Training and Education (ICTE), Germany which were moderating the development of the standard framework draft that was presented in this paper.

REFERENCES

- A. Lipsmeier. (2013). *Approaches towards enhanced praxis-orientation in vocational teacher education (VTE)*. In: TVET@Asia, issue 2, 1-18. http://www.tvetonline.asia/issue2/lipsmeier_tvete2.pdf
- ASEAN. (2013): *The ASEAN Qualifications Reference Framework (AQR)*. http://ceap.org.ph/upload/download/20138/27223751388_1.pdf
- European Communities. (2008). *The European Qualifications Framework for Lifelong Learning (EQF)*. Luxembourg. http://www.ecompetencies.eu/site/objects/download/4550_EQFbroch2008en.pdf
- M. Grosch. And M. Fischer, M. (2015). *An In-Company Trainer Standard for ASEAN Countries*. GIZ. <http://in-company-training-mekong.com/uploads/documents/790d659efd39ef4f410e88f37f72e1e0documents.pdf>
- GIZ. (2011). *Structures and functions of Competency-based Education and Training (CBET): a comparative perspective*. [https://www.giz.de/akademie/de/downloads/Lehrbrief_14_-_Competency-based_Education_and_Training_\(CBET\).pdf](https://www.giz.de/akademie/de/downloads/Lehrbrief_14_-_Competency-based_Education_and_Training_(CBET).pdf)
- J. Hattie. (2008). *Visible Learning: A Synthesis of Over 800 Meta-Analyses Relating to Achievement*. NY: Routledge
- RCP. (2011). *Institutional Development of Vocational Teacher Education in Lao PDR 2010-2020*. Vientiane.
- S. Dreyfus and H. Dreyfus. (1980). *A Five-Stage Model of the Mental Activities Involved in Directed Skill Acquisition*. Washington, DC. <http://www.dtic.mil/cgi-bin/GetTRDoc?AD=ADA084551&Location=U2&doc=GetTRDoc.pdf>
- UNESCO/UNEVOC. (2009). *Regional Seminar on TVET Teacher Education for Sustainable Development*. RMIT's Vietnam Campus HCMC.

THE ROLE OF THE PRIVATE SECTOR IN VOCATIONAL EDUCATION

Anthony Borkett

PT Thiess Australia
email: tborkett@thiess.co.id

ABSTRACT

There is continuing debate and focus on the subject globally by governments, education professionals, non-government donor organizations and industry. Why is Vocational Training of interest to such a broad contextual spectrum? We could arguably summarize the reason simply as; it potentially means some form of monetary gain for all concerned. The increasing globalization of business and migration of multi-national human resources brings with it a range of other aspects that arguably increase the importance and complexity of VET to all stakeholders. The private sector does not always know how or what is possible to improve competency aspects within their own organization and the regional community. A company does not always provide training that will satisfy quality aspects and be producing well trained resources. However it can possibly be argued that any form of training by a private sector organization is positive and is contributing to improving VET skills of individuals and in the community as whole. Private sector representatives do not always have the answers to competency improvement and how private sector can and possibly should contribute to improving vocational education and training. However a company will know what the task requirements are in relation to any position in the organization and have resources who will know the skills and knowledge required for particular tasks and they will know what standards of competency is required to produce the product.

Keywords: private sector, vocational education, apprentice training program, work experience

I. INTRODUCTION

I think we agree that Vocational Education and Training (VET) is a critical element in national workforce capability development. There is continuing debate and focus on the subject globally by governments, education professionals, non-government donor organizations and industry.

Why is Vocational Training of interest to such a broad contextual spectrum? Based on my observation and experience I suggest that we could arguably summarize the reason simply as; it potentially means some form of monetary gain for all concerned. Regardless of the publicized agendas of some of the parties at the senior strategic/policy making levels in organizations it can arguably be reduced to elements such as improving the economic status of the country, increased profits for company shareholders, more funding for the NGO and so on.

There are other factors that are important to the parties too but the financial side in its various forms is possibly the most significant. I hasten to add that for the many individuals within the organizations that are

directly involved in making VET happen it's not all about money. There are numerous other motivational drivers both intrinsic and extrinsic in nature. We are all here today because we are professionals and passionate about training and developing others. In many cases education professionals are poorly paid considering the dedication and time they have invested in becoming professionals and in terms of the effort they put into teaching others. I have witnessed trainers /teachers in some countries selling snacks to students at the day's end to make sufficient money to feed their families.

This is possibly another topic and part of the challenge of improving vocational education and training standards in many countries. So who directly benefits from competent human resources? I suggest that private industry arguably can profit the most followed by the country and community.

The increasing globalization of business and migration of multi-national human resources brings with it a range of other aspects that arguably increase the importance and complexity of VET to all stakeholders. It also opens other opportunities particularly for emerging

economies such as skilled worker exportation globally and the injection of income back into the country to families. Returning workers potentially bring with them new skills, technology and business ideas.

II. METHOD

My topic today is on the role of the private sector in improving competency in vocational training. For my presentation I will separate the private sector into two groups.

1. The industry groups - mining, construction, manufacturing, retail and so on.
2. The private training provider industry.

I will talk on the first group only as this is the group I have a depth of experience with and is possibly one of the key driving factors in VET globally.

III. DISCUSSION

So what role can and should private sector industry play in improving competency in VET?

The part industry actively play in terms of being a stakeholder varies between companies and countries. The Australian system is highly regulated in terms of accredited training as are many countries. Arguably it still has numerous options for improvement in terms of the regulatory stakeholder complexity and true consistency of quality achieved. However it does attempt to have the private sectors input to ensure that national VET competencies are aligned to industry needs and encourage ownership of the outcome. This is possibly one of the key proactive actions that private sector organizations can do to ensure that VET competency training and education programs that are nationally accredited are truly reflecting business needs. The competency needs of industry today in the global market place combined with the rapidly changing technological environment require the private sector to do more to ensure they have the workforce competencies required to be competitively productive. It also reflects the way training is done in some industry sectors. At this point I will introduce some of the VET

related programs Thiess are currently involved in.

Thiess training and development capabilities are broad and structured to suit the business needs. This requires flexibility in the competencies, systems, project specific development programs and the training resources utilized. Thiess training and systems are benchmarked to international industry standards and the Australian Quality Training Framework requirements

3.1. Apprentice Trades Training Program

This is a four year program which complies with the Australian Certificate III requirements.

The participants graduate with an Australian Certificate III in the respective trade.

- Heavy mobile equipment Mechanic - Certificate III Engineering - Mechanical
- Heavy mobile equipment Electrician - Certificate III Engineering - Electrician
- Welder - Certificate III Engineering - Welder

Thiess have an agreement with an Australian registered training organization. In this case that is a university who acts as the compliance auditor the program and certification issuing authority. The University and the Thiess program are audited by the Australian Standards and Quality Association. The training is done in Indonesian language and all trainers are Indonesian nationals. The curriculum includes a requirement that the apprentices become competent in English.

3.2. Trades Training

This is a trade's skills gap, learning and development program designed for local hire trades employees. These resources generally have no formal qualification however they may have many years on-the-job experience. The competency gap is in terms of theory and the correct practices and procedures. The program also allows a workshop helper, for example, an opportunity to become a skilled tradesperson. The competencies are aligned to the Australian standards, based on the

Apprenticeship competency sets and learning packages. The packages and the training methodology are changed to suit participants who are older adults if compared to the younger apprentice program participants.

3.3. Trades Specialist Program

This program takes tradespeople to the next level. The participants are trained to be specialist technicians in machine equipment types. This effectively reduces the reliance on external specialist resources from the manufacturer. The return on investment is easily measured and has proven to be significant.

Other Vocational Competency Sets:

- Administration & Accounting
- Front Line Supervision and Management
- Heavy Equipment Operators
- Information Technology related
- Occupational Health and Safety
- Other competency sets related to positions required within a mining context.
- Procurement & Logistics

External Training Providers are engaged as required when internal training capability is not available.

3.4. Community VET Engagement

This is a self-sustaining program that generates pools of community based national resources aligned to industry requirements. We provide the resources to change the institutions' standards and capabilities, and to align the outcome more to industry requirements, with no strings attached.

We have an MOU with all our partners which outline potential cooperation areas between the two parties. The skills streams we are potentially able to assist with are based on our internal training capabilities.

We also can assist in establishing custom designed fast track up-skilling / semi-skilling courses through selected TTI partners. This has proved to be a successful approach to taking resources with low skills and rapidly changing them to resources with suitable competencies for immediate employment in some sectors such as the construction industry.

3.5. Work Experience

Work experience programs are common throughout industry. It is also a challenge for many VET related training schools/centers to find work experience placements for students during the learning periods. It is also common that work experience students are given tasks that are limited in the actual learning benefit to the student. Thiess attempts to structure work experience in such a way that it is a productive and a win-win scenario for all concerned.

The programs are structured to suit the student's profession and the target work place experience. For example for trades related students placed in the workshops a bridging course is the first stage of the engagement. This identifies gaps in knowledge required in relation to the targeted tasks and corrects these gaps. It also involves an intensive occupational health and safety training requirement. The tasks give students from selected SMKN and polytechnics a chance to experience and utilize their learning in a production work place. It also gives the company productive resources during the experience period. The students participating in this particular program generally are all offered employment either by Thiess or other companies even before they complete their formal studies as a result of the experience in the program. The institutions are selected depending on the field of competency we are offering.

3.6. Australian Context

In Australia the company training requirements and training and assessment resourcing is structured differently. The country has a well-developed VET training capability and available resources.

The company largely is dependent on private sector training providers using assessment packages that were based on the Australian accredited packages for any training they required in addition to the skills that employees already had. In practice this at times resulted in varying standards of outcome. Other country operations developed their own in house training programs. National engagement in VET

improvement was done by way of input through the nationally structured industry engagement avenues.

In 2016 the company embarked on a strategy to have a standard frame work globally. That is to have the same competency standards and competency sets for all positions in our operations globally. This requires all assessment packages and training packages to be the same with local context variations if required among other challenges. This takes VET competency standardization and improvement within the company to the next level. Arguably global standards in VET are something numerous organizations such as UNESCO and the OECD have been advocating for a decade or so.

3.7. Financing of VET Training

Private sector organizations are in business to make money. That's basically it! Many will wish to be portrayed otherwise in terms of corporate responsibility aspects however the bottom line is they are in it to make money. Profits are affected by any expenditure that does not give a return on the investment.

Companies generally see overheads as a necessary burden and training is part of the overhead costs. Measuring and producing evidence to show the return on Investment ROI that will justify training expenditure can be a challenge. We all know that many small companies prefer and in some cases can only afford to rely on an employee learning on the job informally or semi-formally, rather than investing in formal training programs across a full spectrum of skill and knowledge requirements.

This observation appears to be consistent with some Asian Development Bank (ADB), and other global organization studies. At the other end of the spectrum some multinational organizations invest large sums of money for internal training interventions as they do recognize the return from that investment. However we have many companies with a strategy somewhere between these more extreme cases. So how do we successfully encourage

companies to contribute more to improving VET competencies?

3.8. Funding Options

One approach has been to impose a training levy in some countries. This appears to have had mixed success. My experience is that many countries have large pools of unclaimed funds suggesting that even though companies pay the levy they do not necessarily carry out training as a result of it. There are numerous possible reasons for this.

“Levies have the potential of providing large amounts of funding. However, levies do not on their own guarantee greater participation in training, and research suggests that levies alone do nothing to improve the quality of skills development” (ADB, 2014, p. 24).

Other forms of Public-Private Partnerships have been established in some countries with varied success.

It is possible with a little innovation to structure and establish satisfactory training capabilities at a relatively low cost with little capital investment. Thiess spends a considerable amount on training annually, however it is my experience that it is possible to establish similar capabilities in some countries at a fraction of the cost by simply looking at what is required and what is possible in the given context - *differently*. For example, one scenario resulted in an initial establishment of a company apprentice program in a national VET school by renting unused workshops and associated facilities, purchasing second hand scrap parts for training aids from second hand vendors, partnering with a neighboring countries college to provide trainers to train the national trainers and establishing a cooperation agreement directly between selected national vet institutions and the neighboring country which resulted in a sustainable change to VET competency delivery and capability.

Possibly is not an overly innovative model. However until the alternative model was suggested the company had been struggling with a big budget Australian

model concept with expensive consultant third parties and as a result of that nothing had been done.

It took some effort to sell the alternative approach I might add and numerous parties expected it to fail. It did not fail and continued to be successful and to morph with the growth and changing needs of the company.

IV. CONCLUSION

The private sector does not always know how or what is possible to improve competency aspects within their own organization and the regional community. A company does not always provide training that will satisfy quality aspects and be producing well trained resources. However it can possibly be argued that any form of training by a private sector organization is positive and is contributing to improving VET skills of individuals and in the community as whole.

Private sector representatives do not always have the answers to competency improvement and how private sector can and possibly should contribute to improving vocational education and training. However a company will know what the task requirements are in relation to any position in the organization and have resources who

will know the skills and knowledge required for particular tasks and they will know what standards of competency is required to produce the product.

I suggest that the best approach to engage private sectors input into VET competency improvement on a national scale should involve cross sectional industry benchmarking and a collaborative process with education professional stakeholders from both national regulators and providers.

However: Do not wait for the private sector to initiate this. Unless the company is a private training provider, training will not be the company core business producing revenue for the shareholders. Only a few companies will have management with a vision which results in national third party engagement.

Private sector engagement initiatives need to come from governments and education sectors.

REFERENCES

- Asian Development Bank, (2014). *Sustainable Vocational Training Toward Industrial Upgrading and Economic Transformation: A Knowledge Sharing Experience*. Asian Development Bank, Manila, Philippines.

THE ROLE OF TVET FOR IMPROVING ECONOMIC GROWTH AND LABOR IN ASEAN ECONOMIC COMMUNITY ERA

Soenarto

Department Head, Technical and Vocational Education
Graduate School of Education,
Yogyakarta State University

Keywords: TVET, economic growth, AEC

AFTA, AFLA, & ASEAN ECONOMIC COMMUNITY (AEC)

ASEAN Free Trade Area (AFTA) has been virtually established in 2003. It was formed of the 10 Association of South East Asian Nations (ASEAN) member states: Brunei Darussalam, Cambodia, Indonesia, Laos, Malaysia, Myanmar, Philippines, Singapore, Thailand and Vietnam.

ASEAN Member Countries have made significant progress in determining the kind of product and the lowering of intra-regional tariffs through the Common Effective Preferential Tariff (CEPT) Scheme for AFTA. A core tenet of the ASEAN Economic Community (AEC) is to be a free flow of skilled labour. But what does this really mean, and what impact will the AEC have on workforces in Asia?

The Visions of workers freely moving between member states, reduced border control and increased access to state social security benefits spring to mind. In reality, however, there is a gulf of difference between the EU's free movement of people and the AEC's free flow of skilled workers.

1. In the EU a citizen can freely move, reside and seek employment in any member state, regardless of skill level; but the AEC has a far more limited approach.
2. The AEC member make concessions only to eight professions this point: engineering, nursing, architecture, medicine, dentistry, tourism, surveying and accounting.
3. further limitations on the free movement of that skilled workers: (a) There are minimum years of experience requirements, (b) labour market tests, (c) pre-employment requirements such as health clearances and numerous other

domestic immigration and professional aspects.

Organisation that employ people in those eight professions, should consider: (1) given to the new one, (2) wider talent pool that the AEC is establishing. (3) People seriously can make use of the increased mobility of professionals keen to seize new opportunities.

AEC as a new economic community is being formed in 2016 to represent 625 million people and become the world's seventh largest economy. AFTA, AFLA, and AEC stimulate the conducive environment: (1) the developed countries tend to move their industries to the developing countries in order to get raw materials, to find place for selling product, and to get cheaper for labor, (2) the developing countries have not yet concern, developing countries need and hope investment in order for their economic growth, absorption of the workforce, and decreasing unemployment

Report of World Economic Forum, Human Capital Outlook: ASEAN June 1, 2016, showed that:

ASEAN'S PERFORMANCE IN A GLOBAL CONTEXT

The World Economic Forum's annual Human Capital Index benchmarks and quantifies how countries are developing and deploying their human capital, and tracks each nation's progress over time. It takes a life-course approach to human capital, evaluating not only the levels of education, skills and employment available to people across different ages, but also how well economies around the world are leveraging this potential for the benefit of economy and society as a whole. Covering

more than 120 countries—representing 92% of the world’s people and 98% of its GDP—the Index measures a country’s present performance against an ideal benchmark, and offers insight into how well a country is positioned for deploying talent in the future.

Table 1. Human Capital Index 2015 ranking of ASEAN countries

Global Rank	ASEAN Country	Score
24	Singapore	78
46	Philippine	71
52	Malaysia	70
57	Thailand	69
59	Vietnam	68
69	Indonesia	67
97	Cambodia	59
105	Lao PDR	56
112	Myanmar	53

Note:

Insufficient data to cover in 2015 edition: Brunei Darussalam.

DEMOGRAPHICS AND WORKFORCE STRUCTURE

Since 1990, ASEAN’s population of approximately 625 million people has almost doubled, and by 2025 it is expected to reach 694 million. It accounts for 8.6% of the world total, is equal to the combined populations of

Latin America and the Caribbean, and is larger than that of the European Union and doubles that of the United States.

ASEAN is experiencing significant demographic change: it will see 68.2 million new entrants to the labor force by 2025. There is high labor force participation among the region’s population, as well as a relatively narrow labor force participation gender gap. High-skilled workers i.e. those educated to degree level are noticeably younger than ASEAN’s workforce as a whole, having a median age in the mid-20s, leading to a potential “demographic dividend” from an increasingly well-educated younger population. While nearly 40% of the overall workforce in ASEAN is occupied in agriculture, an equal number (41%) is engaged in the services sector while 19% are involved in industry although this picture varies across the countries of the region. Vietnam and Thailand have a more agriculture-heavy labor market, while Singapore, Malaysia, the Philippines and Indonesia have more services-based workforces. Malaysia has the region’s largest share of the workforce in industry. Across the region economic and developmental indicators have improved steadily over the past decade, although more work remains to be done (Table 2).

Table 2 Labor market conditions in ASEAN

Country	Ease of finding skilled employees (7=easiest, 1=hardest)	Average monthly wage (US\$)	Workers in vulnerable employment (%)	Incidence of child labor (%)
Cambodia	3.4	121	64	18.3
Indonesia	4.3	174	36	6.9
Lao PDR	3.1	119	83	10.1
Malaysia	5.3	609	22	-
Myanmar	2.4	-	89	-
Philippines	4.4	206	42	11.1
Singapore	4.8	3547	9	-
Thailand	3.8	357	56	8.3
Vietnam	3.4	181	63	6.9

Note: “Workers in vulnerable employment” refers to the number of unpaid family workers and informal sector own-account workers” as a share of total employment.

WHAT ABOUT WORK FORCE CONDITIONS IN INDONESIA?

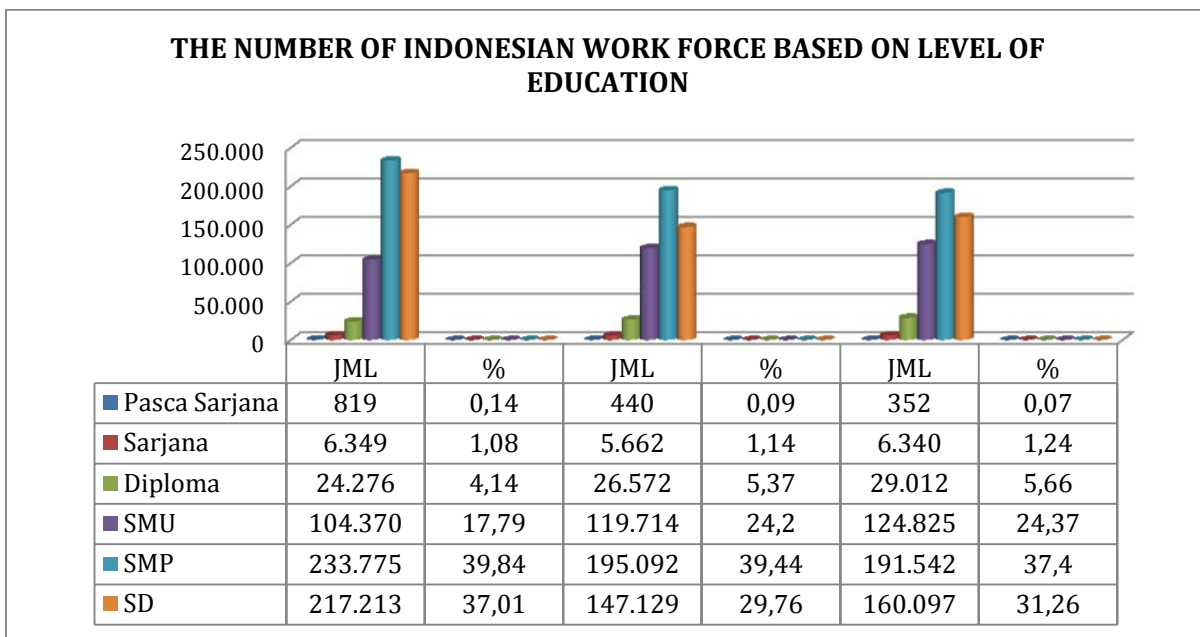


Figure 1 The number of Indonesia work force linked to the educational level

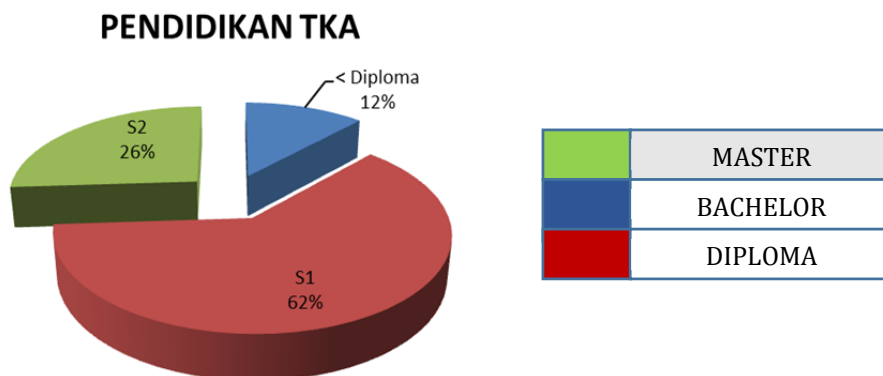


Figure 2 Number of Foreign Work force In Indonesia Base Education

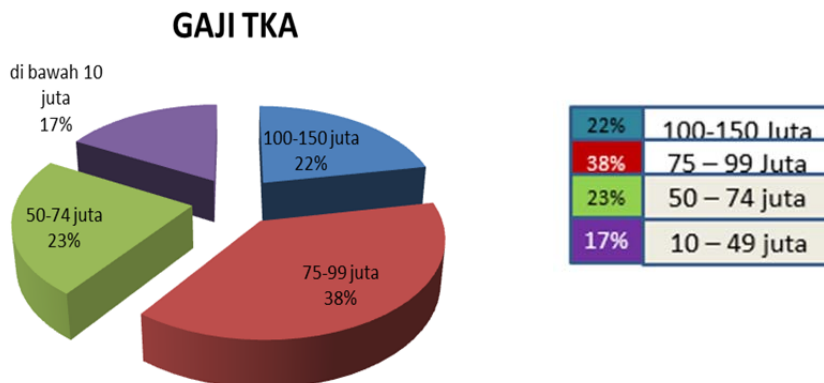


Figure 3 Number of Foreign Work force In Indonesia Base on Salary

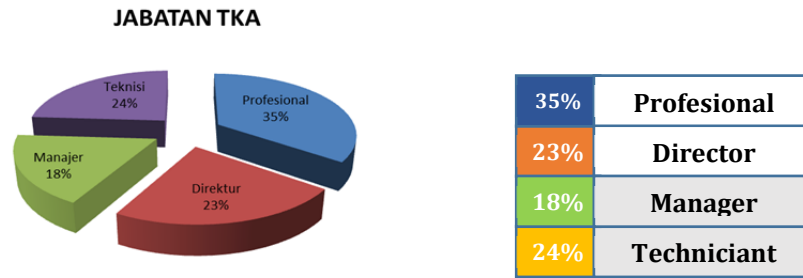
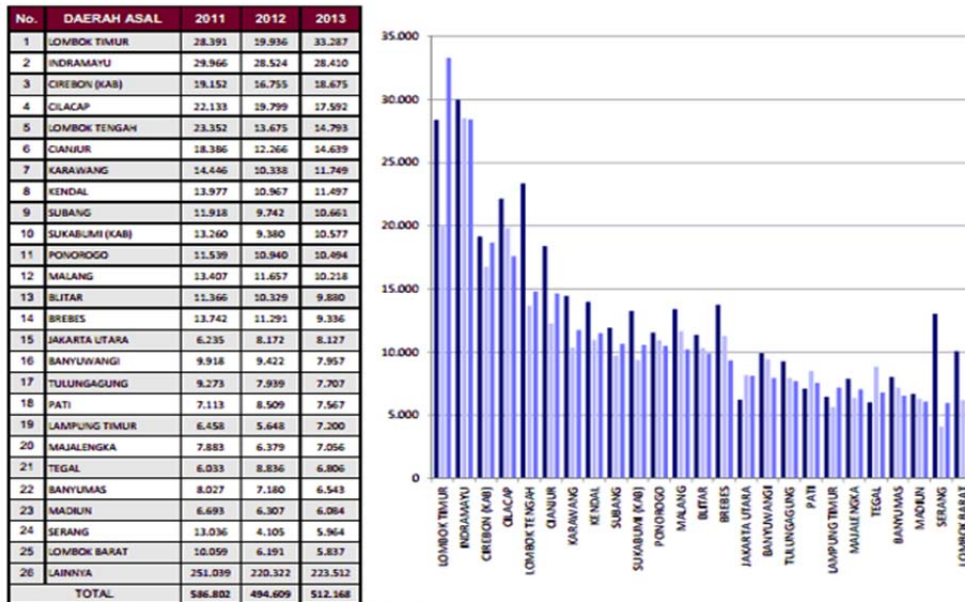
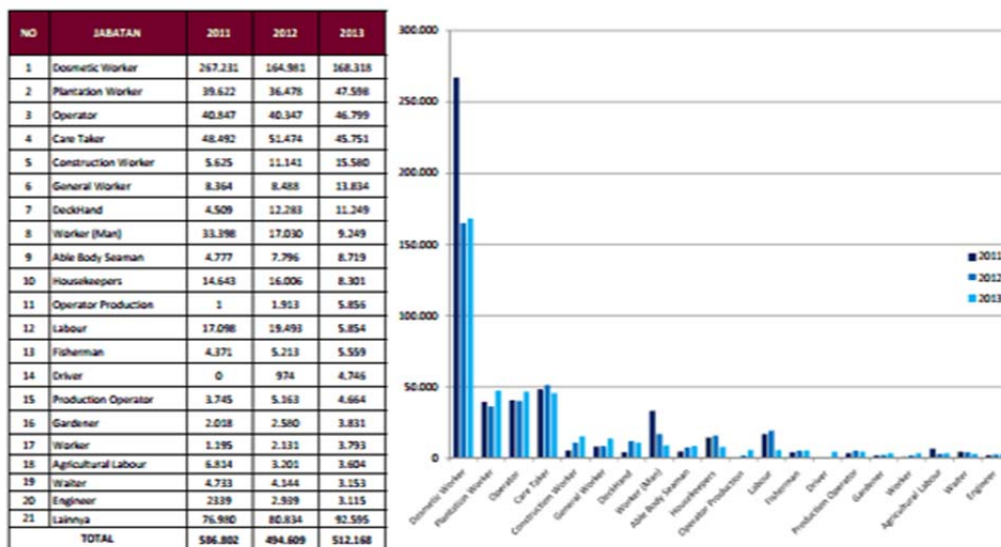


Figure 4, Number of Foreign Workforce in Indonesia Base on Occupation Level



Sumber data: PUSAT PENELITIAN PENGEMBANGAN DAN INFORMASI (PUSLITPO BNP2TKI)

Figure 5. 25 Kabupaten/Kota terbesar penempatan tenaga kerja luar negeri Indonesia Periode 2011 s/d 2013.



Keterangan :
TKI di Luar negeri bekerja di ± 600 jabatan
Total Data TKI PELAUT Tahun 2013 = 36.794

Sumber data: PUSAT PENELITIAN PENGEMBANGAN DAN INFORMASI (PUSLITPO BNP2TKI)

Figure 6. 20 Jabatan terbesar penempatan tenaga kerja luar negeri Indonesia Periode tahun 2011 s/d 2013

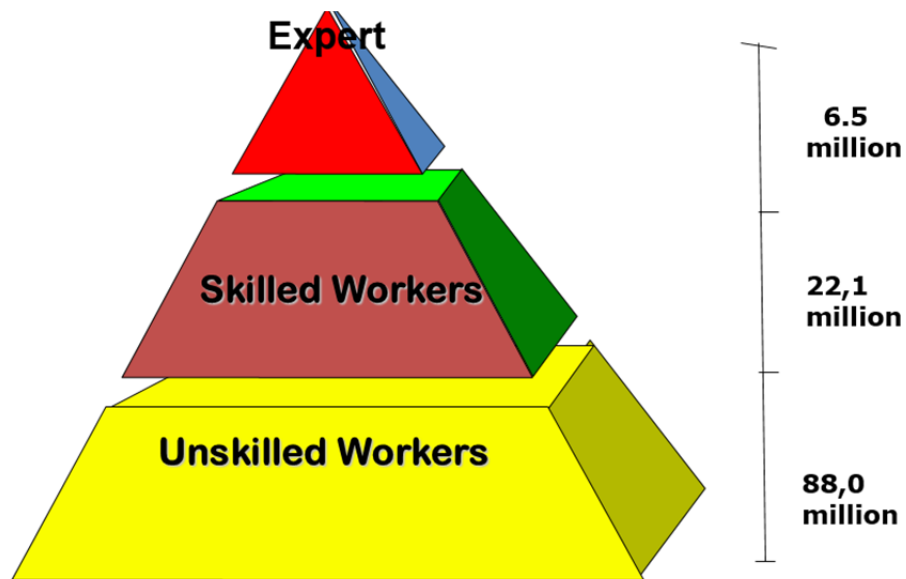
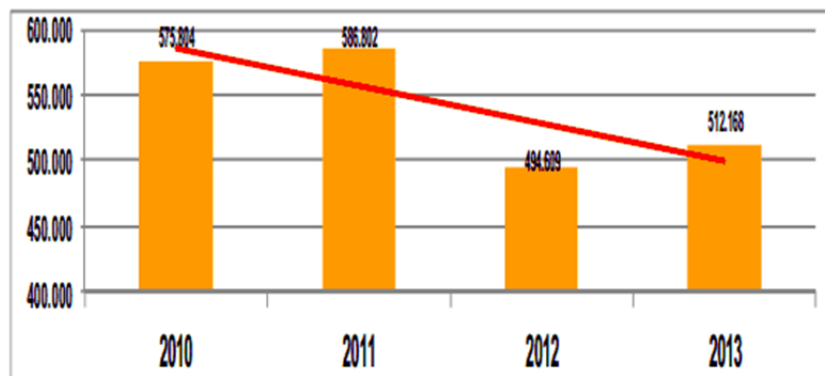


Figure 7. Indonesian Man Power Structure (Source: BPS, 2010)

PENEMPATAN TENAGA KERJA INDONESIA
Tahun 2010 s/d 2013



NO	TAHUN	JUMLAH TKI
1	2010	575.804
2	2011	586.802
3	2012	494.609
4	2013	512.168

Keterangan:

1. Jumlah Penempatan Tahun 2013 Meningkat sejumlah 17.559 orang (3,6%) dibanding Tahun 2012 .
2. Peningkatan utamanya dikarenakan ada pengetatan penempatan di debarkasi perbatasan (Sambas, Entikong)

Sumber data: PUSAT PENELITIAN PENGEMBANGAN DAN INFORMASI (PUSLITFO BNP2TKI)

3

Figure 8. Indonesia Man Power Structure (Source: BPS, 2010)

Demographic Bonus is the basis for increasing economic productivity and development of the domestic market.....

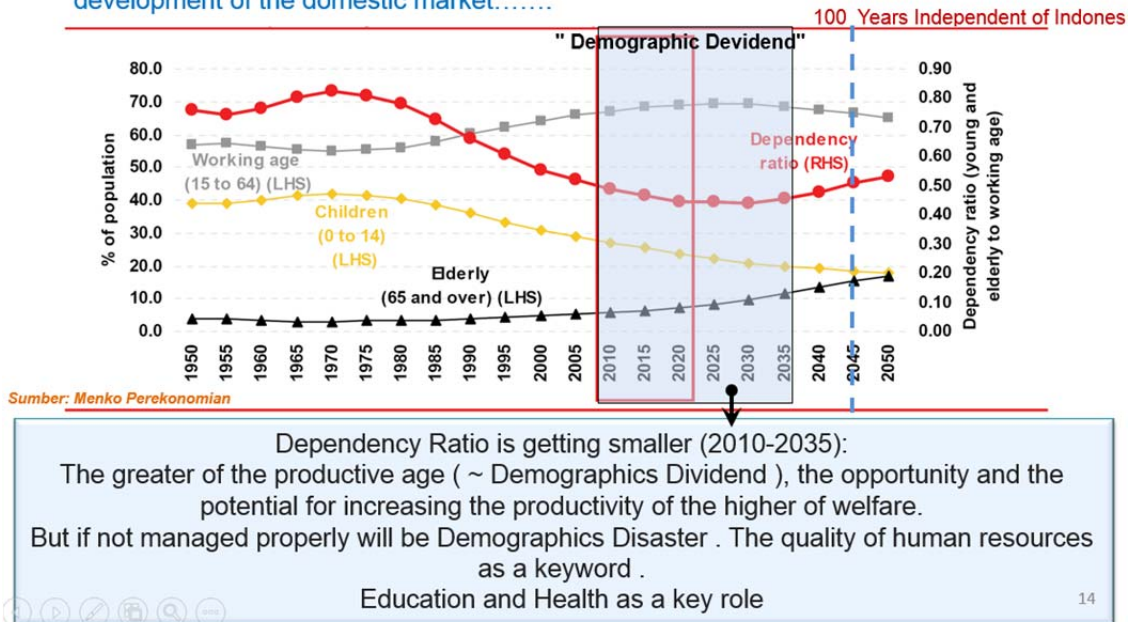


Figure 9 Indonesian Human Resources Modality

NATIONAL MASTERPLAN

Accelerating And Expanding of Indonesia Economic Development In 2011-2025

NAWACITA JOKOWI JK

1. Membangun infrastruktur jalan baru sepanjang sekurangnya 2000 KM.
2. Membangun sekurangnya 10 pelabuhan baru dan merenovasi yang lama.
3. Membangun sekurangnya 10 bandara baru dan merenovasi yang lama.
4. Membangun sekurangnya 10 kawasan industri baru pengembangan untuk hunian buruhnya.
5. Membangun sekurangnya 5000 pasar tradisional di seluruh indonesia dan memodernisasi pasar tradisional yang telah ada.

6. Menciptakan layanan satu atap untuk investasi, efisiensi perijinan bisnis menjadi maksimal 15 hari.
7. **Membangun sejumlah science and technopark di kawasan politeknik dan SMK-SMK dengan prasana dan sarana teknologi terkini.**
8. Melakukan revolusi karakter bangsa melalui penataan kurikulum pendidikan nasional, mengedepankan aspek pendidikan kewarganegaraan, nilai-nilai patriotisme dan cinta Tanah Air
9. Memperteguh kebhinnekaan dan memperkuat restorasi sosial melalui kebijakan pendidikan kebhinnekaan dan menciptakan dialog antarwarga

THE IMPROVEMENT OF ACCESS AND THE QUALITY OF SECONDARY SCHOOL AND THE RELEVANCE OF VOCATIONAL EDUCATION/ POLYTECHNIC

Secondary Education consist of general secondary education and vocational secondary education (Educ. Low 20/2003; article: 18). Vocational education is a subsystem education which specially help the student to prepare themselves in their future workplace.

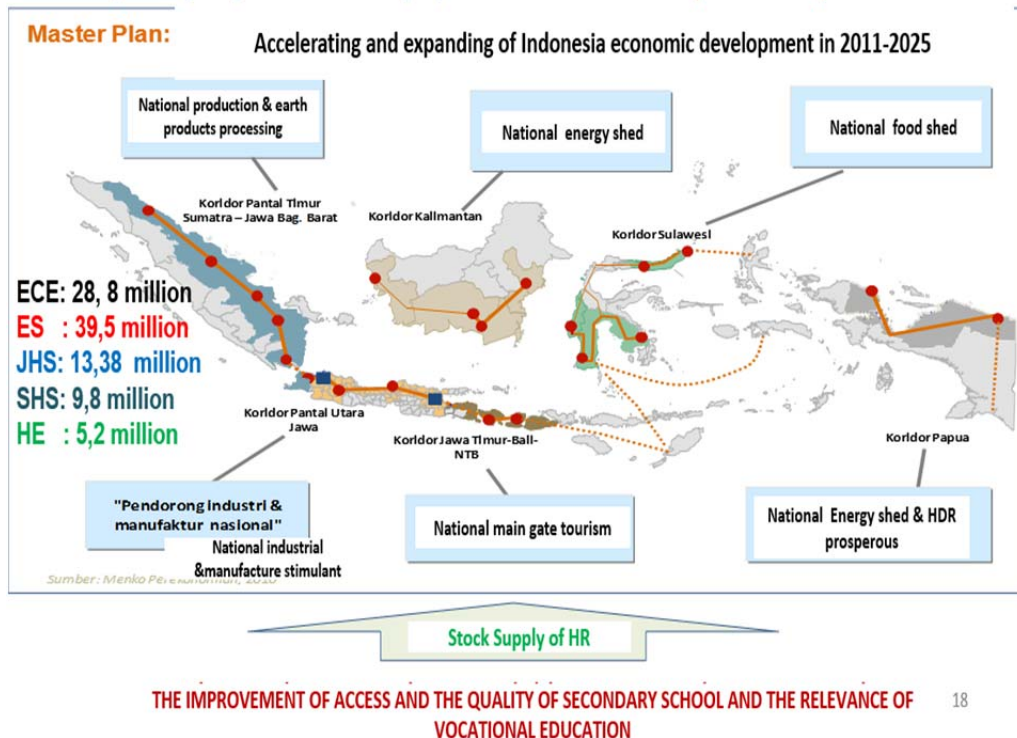


Figure 10

GLOBAL COMPETITIVENESS INDEX INDONESIA 2013/2014
 Stage of development

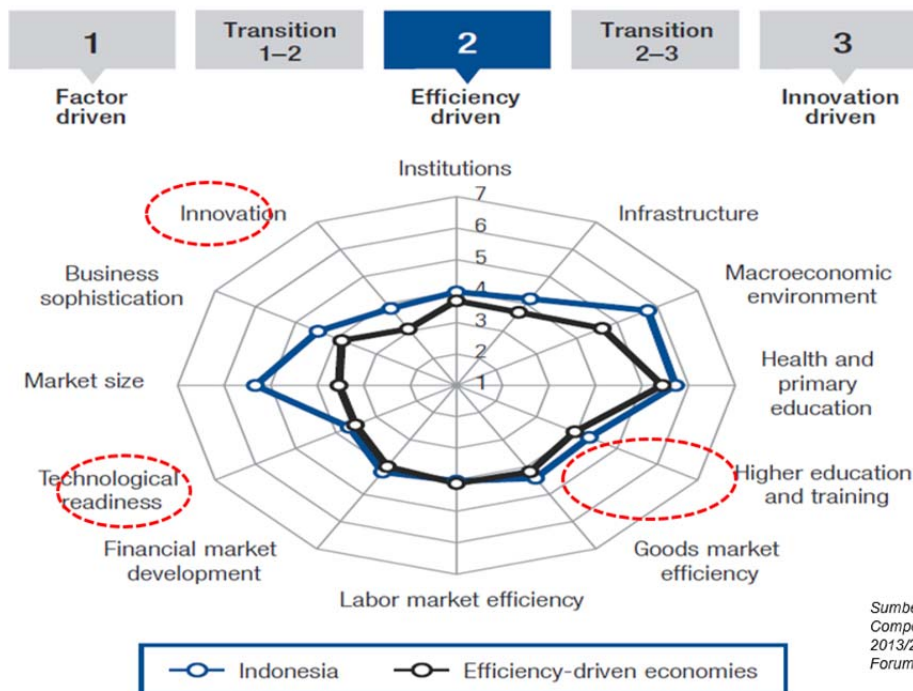


Figure 11.

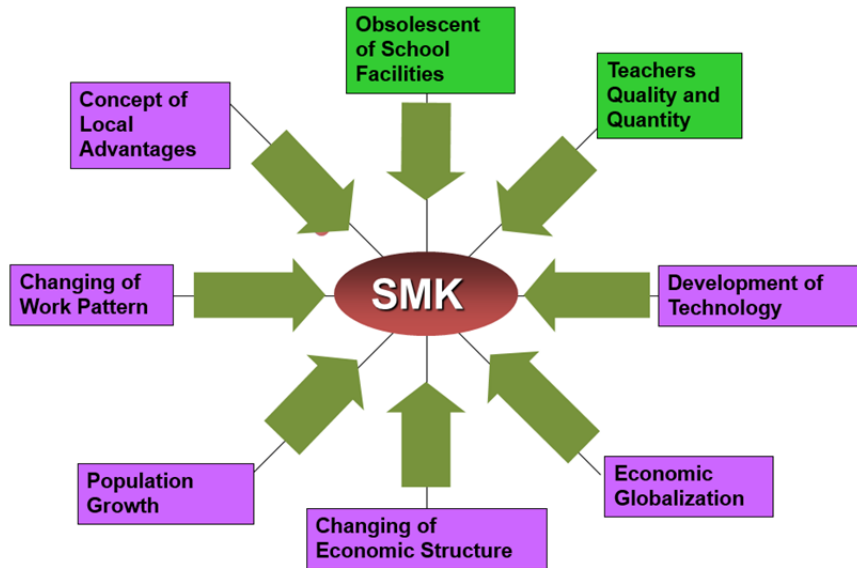


Figure 12. CHALLENGES OF VSS/SMK

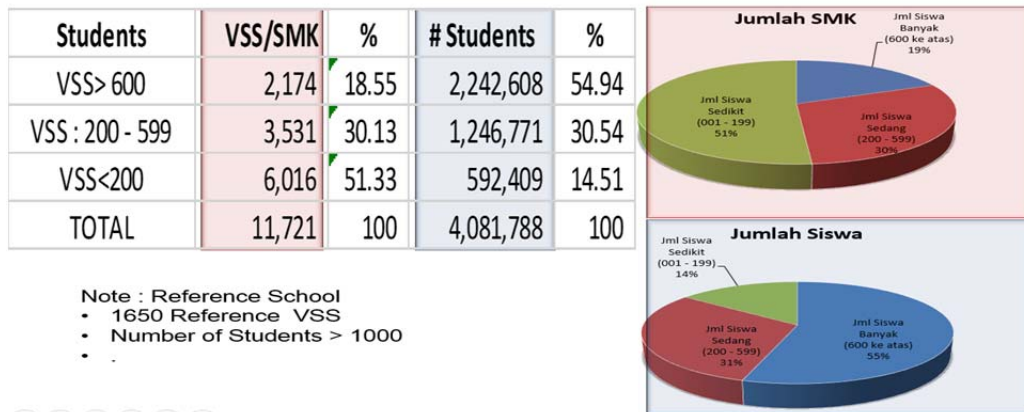


Figure 13. Number of VSS and students

Indonesia Policy : Universal and Compulsory Secondary Education

Universal and Compulsory secondary: are providing accessibility for young generation 16 – 18 years old to attend in SSE/VSE, Maintaining the quality.

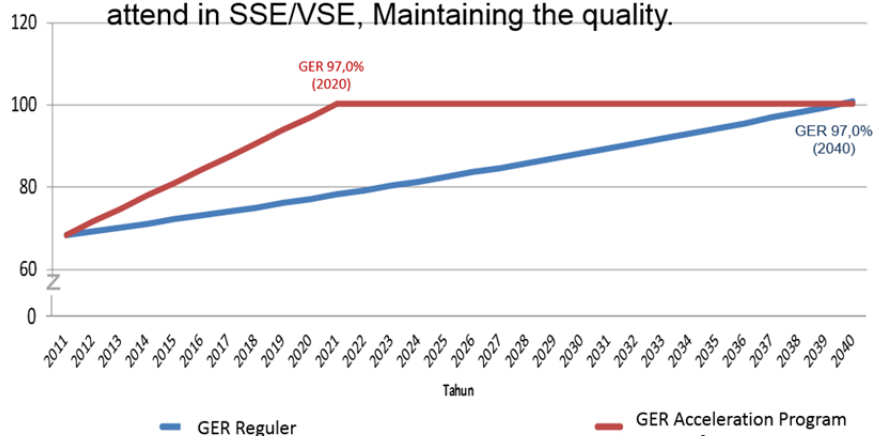


Figure 14.

COMPULSORY VS UNIVERSAL SECONDARY EDUCATION

Compulsory Education since 2015

1. Mandate of Constitution
2. Compulsory for all school age of students
3. Fully funded by Government
4. Punishment for the resistance

Universal Secondary Education 2013 - 2015

1. Secondary education covers General Secondary and VSS
2. Provide widest opportunity for all Indonesian people to attend qualified secondary education
3. Government accommodates to absorb all school age of students
4. Central government, Regional government and the community jointly responsible for funding
5. Tolerable sanction for the resistant

POLICY IMPLEMENTATION

1. Quality Assurance, Corelate with the improvement of capacity
2. Number of Composition of General-Vocational students match with the regional need and their potency.
3. Equal distribution of secondary education service to cover unreachable area
4. Employability improvement for the graduates especially for VSS
5. GER achievement in national, provincial and local level gradually.

6. Providing operation cost for running VSS, 50% coverage Central Government, 50% supported by local government and parents.

IMPROVING CAPABILITY OF TVET / VOCATIONAL SECONDARY SCHOOL

1. Determination school entity data, program training and types of educational services;
2. Mapping and consolidation of skills needs of the industry and stakeholders;
3. The alignment of program training and determination of link and match program in accordance with the conditions and needs of the industry;
4. Restructuring continued socialization governance organization coaching school and school management;
5. The transfer of program training and the adjustment program, the service, the quality target, educator, School management and the education system;
6. Empowerment, coaching and mentoring school on Reference, Alliances and Regular school;
7. Build a network of cooperation between schools, industry, institutions, systems of certification and further education level.
8. Monitoring and evaluation of the results of the alignment of skills program that match with the needs of industry, communities and stakeholders.

MILESTONE QUALITY OF VSS 2015 - 2019

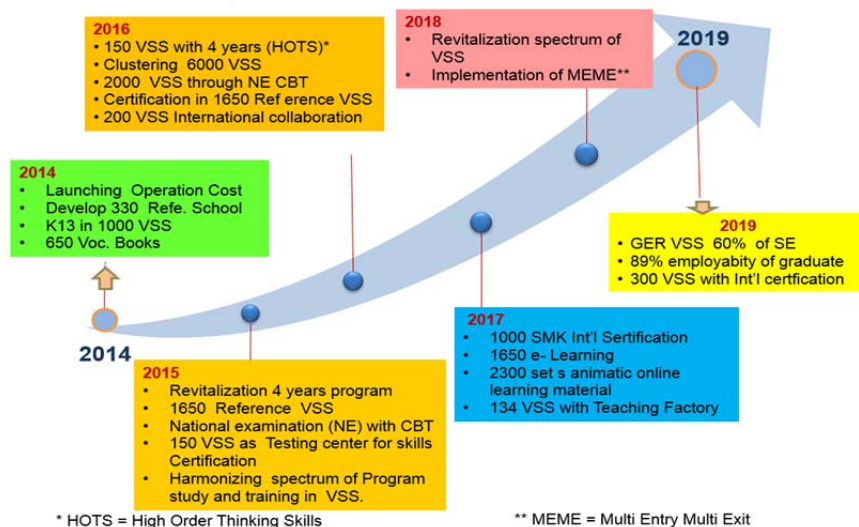


Figure 15

Access, Quality, Relevancies and Public Engagement Strategy of VSS

1. Harmonize and Alignment of Program competency with the needs of the schools and industry areas;
2. Fulfillment the Infrastructure of VSS;
3. Improving the quality of vocational teachers;
4. Empowering Reference Schools: Cluster Model/Mergers;
5. Supporting availability of School Operational Cost;
6. Improving the quality of schools governance though engaging public;
7. Optimization of utilizing ICT in schools;
8. Implementing Quality Assurance of VSS

DELIVERING SKILL FOR EMPLOYABILITIES

Four main components of ‘employabilities-skills’ are:

1. Cognitive or analytical skills include numeracy and literacy; they encompass the thinking or problem-solving skills.
2. Non-cognitive skills are ‘soft skills’ or ‘behavioral skills’. They are widely seen as crucial to securing employment in today’s globalized economy.
3. Technical skills are those that are context-specific and are geared towards a particular occupation.
4. Basic skills, are general and as the foundation for other skills to be developed. People having basic skills are

easily trainable to the new processes the firm is likely to apply

In the global industry, competitive and innovative nature of the products, multinational companies consider flexible, easily-trainable labor

Indonesian Qualification Framework & Recognized Prior Learning (IQF & RPL)

Indonesia Qualifications Framework (IQF) is the former qualification framework developed for qualifications or work competence in Indonesia. The IQF is to help employers compare the many hundreds of competence available in workplace, in school, training center, and in community. The IQF have nine levels, covering all levels of learning outcomes or competence from elementary education (level 1), secondary education, further education, vocational, and higher education.(level 9)

The learning outcomes, work competence, can be achieved through 4 Streams: (1) Education Streamline, through Academic Degree, (2) Profesion Steramline professional Certification, (3) Autodidacs Streamline: Specific Skills Experience, and (4) Industrial Job Streamline: Experience Job and Career.

RWEPL, a process used by regulatory bodies, To evaluate skills and knowledge acquired by outside the classroom for recognizing competence against a given set of competencies standards.

INDONESIAN CURRICULLUM 2013 DEVELOPMENT

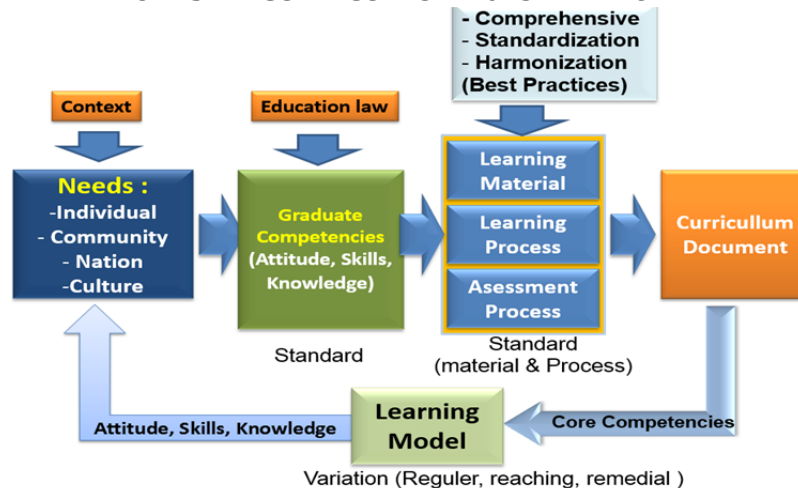


Figure 16

SCALING UP SKILLS OF TVET GRADUATE

- Foundation skills** (literacy and numeracy);
- Transferable of ‘soft’ skills** (the ability to problem solve, communicate ideas, be creative, show leadership and consciousness and demonstrate entrepreneurial capabilities young people need to adapt in the world of work); and
- Technical and vocational skills** (such as using machines, growing vegetables, servicing guest in restaurant or using a computer). (the Global Monitoring Report (2012);
- Raise the Standar of Teaching** significantly with an emphasis on attracting and developing great teachers;
- Develop a more demand-driven curriculum** (especially for TVET institutions);
- Create new, flexible education pathways**;
- Require significant investment to fullfill skills gap.**

INDONESIAN QUALIFICATION FRAMEWORK

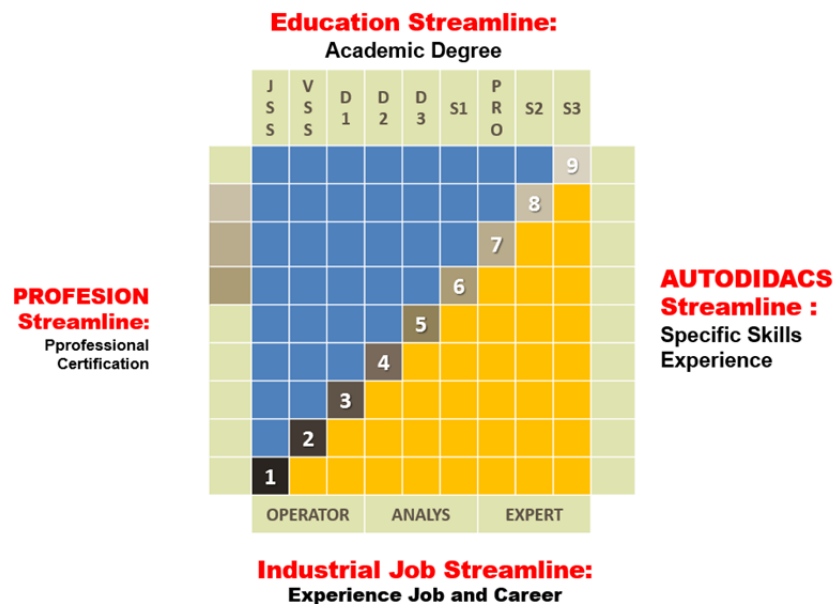


Figure 17

CERTIFICATE COMPATIBILITY OF EDUCATION LEVEL

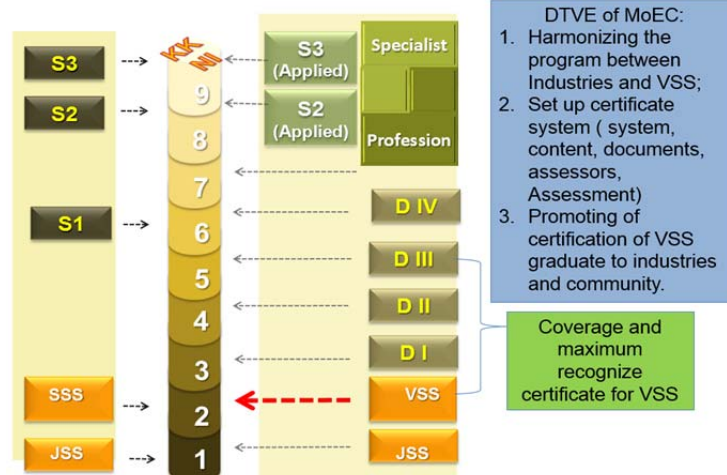


Figure 18

IMPLEMENTATION POLICY

Innovation Program of VET Indonesia

Vocational education and training (VET) continues to be a favored instrument of social engineering for achieving objectives; accelerating economic growth, reducing youth unemployment and benefiting from economic globalization.

1. Improving quality through expanding reference schools;
2. Implementing Teaching Factory;
3. Set up Vocational Schools in Industrial zone;
4. Industrial Based for Vocational School in the remote area;
5. Harmonizing trade and program in Vocational Schools;

6. Certification of schools and graduates;
Program of VET: Indonesia

Psacharopoulos (1997) said that all member's countries (most developing countries) want to be industrial country. Industrialization needs hard skill and soft skill labors for operators. "If technology is seen as a panacea for industrializing a country's economy and achieving higher levels of per capita income, the next logical step is to instill into the labor force the 'necessary skills' for such higher technology to be applied and further developed".

This means that providing TVET is must, and unquestionable in order to produce highly skills workers.

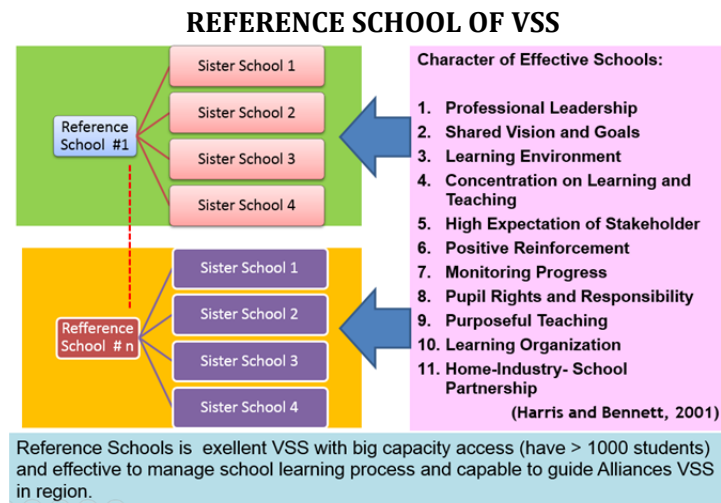


Figure 19

IMPROVING QUALITY OF LEARNING OF REFERENCE VSS

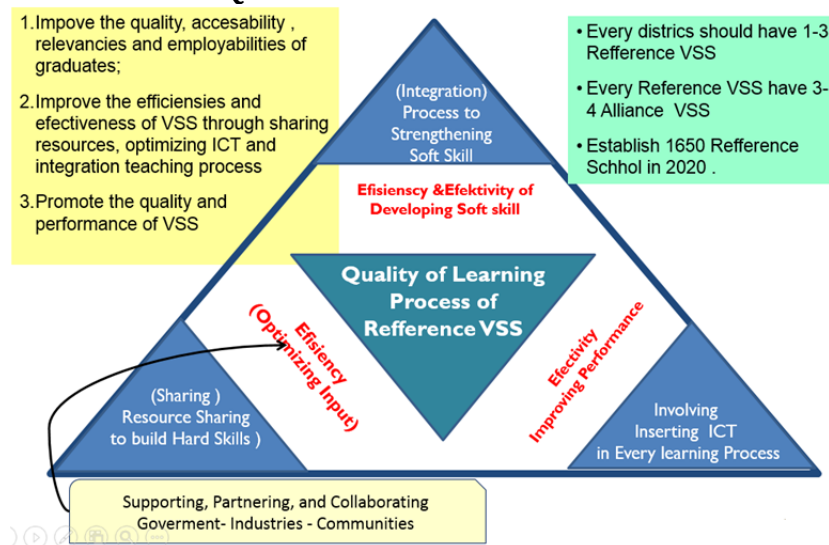


Figure 20

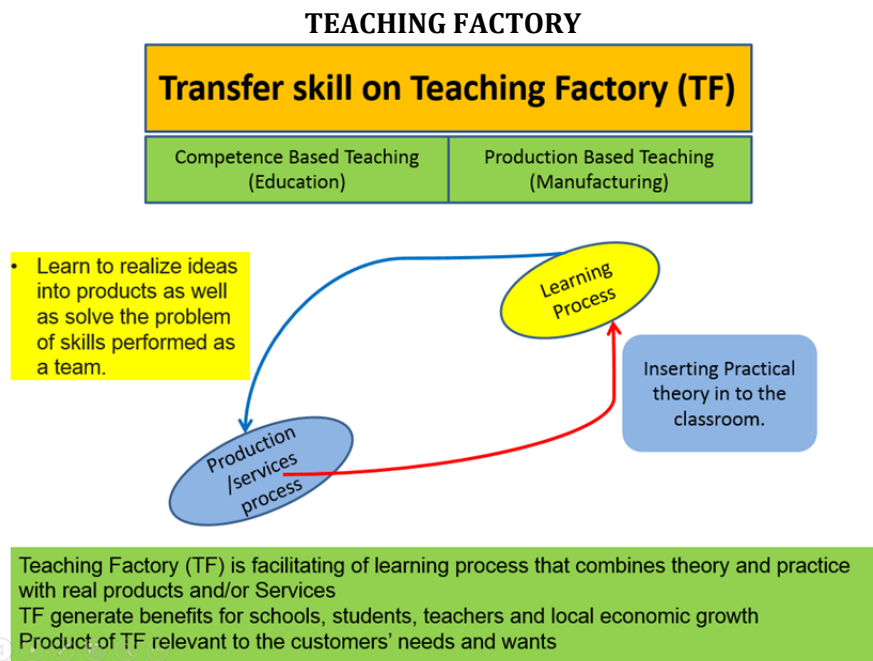


Figure 21



Figure 22

SKILLS IDENTIFICATION FRAMEWORK OF THE TEACHING FACTORIES TO DELIVER HOTS

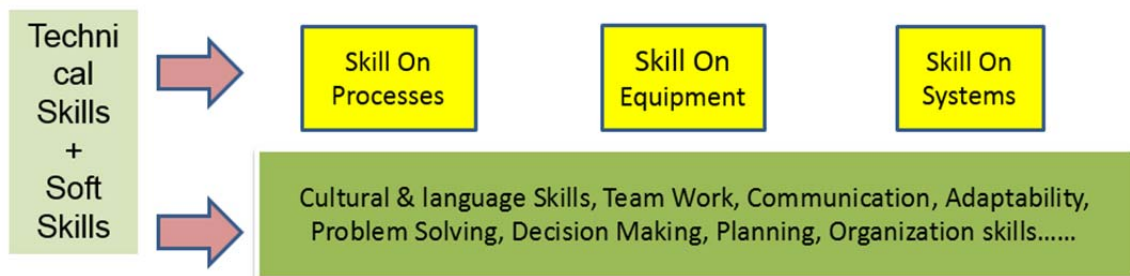


Figure 23

1. Technical Skills consist of process skills, equipment usage, and skills for production system
2. HOTS (Higher Order Thinking Skills) are a combination of technical skills with soft skills;
3. Soft skills consist of language skills, communication, teamwork, adaptability, decision making, planning and problem solving;
4. HOTS can only be obtained through a combination of classroom learning in the workshop, in industry and in the field of work;
5. HOTS possible education requires a duration of 3 years or 4 years program.

INSTUCTIONAL METHODE

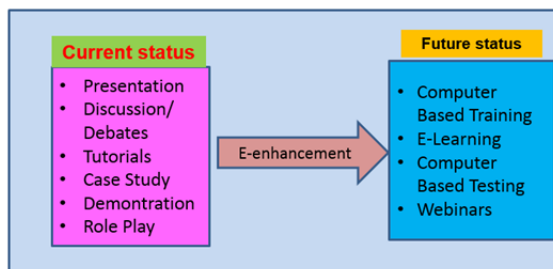


Figure 26

Learning Method changed since the arrival of ICT in the classroom; Materials and teaching materials enriched through the

provision of various sources of learning so students can more quickly acquire and infer information comprehensively

REFERENCES

_____. (2016). *Human Capital Outlook: Association of Southeast Asian Nations (ASEAN), World Economic Forum, Regional community briefing*, Kuala Lumpur Malaysia, June 1-2, 2016.

Dezan Shira & Assosiated. (2011). *Master Plan Acceleration and Expansion of Indonesia Economic Development 2011-2025*, Coordinating ministry for economic affairs ministry of national planning and development/national development planning agency.

Direktorat Jenderal Pendidikan Tinggi Kemdikbud. (2012). *Kerangka Kualifikasi Nasional Indonesia, Indonesian Qualification Framework*, Peraturan Presiden Nomor 8 Tahun 2012.

Klaus Schwab. (2016). *The Global Competitiveness Report 2015-2016: Full Data Edition* is published by the World Economic Forum within the framework of the Global Competitiveness and Risks Team.

DIGITAL MEDIA RESEARCH IN EDUCATION: THE USEFULNESS OF THE INSTRUMENTAL CONFLICTS THEORY

P. Marquet

LISEC, University of Strasbourg, France
e-mail: Pascal.Marquet@unistra.fr

ABSTRACT

The purpose of this presentation is to define and to illustrate the concept of instrumental conflict, as a tool to a better understanding of the difficulties that learners encounter while using ICT (Information and Communication Technologies). An instrumental conflict takes its meaning within the framework of Rabardel's theory of instruments, which in itself is a part of the more general theory of activity. The main idea is that VLE (Virtual Learning Environments) associate three different types of artefacts: didactical, pedagogical and technical. These artefacts must be correctly combined, so that learners can have access to knowledge, which is embedded in the device. We point out the usefulness of such a concept. We thus describe how scientific communities, which focus on didactics of Mathematics and computer science, and on ICT in education and training in particular, deal with difficulties of implementation and exploitation of ICT. It appears that some objects called either didactical objects or pedagogical objects represent a reality, which is similar and extremely wide at the same time. In fact, this ambiguity justifies the distinction between didactical artefacts, pedagogical artefacts and technical artefacts. We finally give some examples of obstacles that can be considered as instrumental conflicts as well as some possible developments offered by the concept of instrumental conflict.

Keywords: theory of instruments, theory of activity, instrumental conflict, didactical artefact, pedagogical artefact, technical artefact

I. INTRODUCTION

Over several years, a unanimity has grown up around interest in an instrumental approach as a particularly rich heuristic perspective upon understanding human activity, particularly those in which computers are used [1, 2]. It must be remembered, however, that this instrumental approach takes as its conceptual base theories of activity developed by Vygotski since the 1930s, the period in which he advanced the first attempt at a theory conceptualising activity mediated by tools and signs, which Rabardel [3] reframed and extended to contemporary technologies.

The aim of this article is to show how Rabardel's approach can be applied to school teaching situations or to training involving ICT (Information and Communication Technologies). Such situations constructed by design, are often complex and demand that their subjects interact with objects of different natures: didactical, pedagogical, technical. Virtual Learning Environments (VLEs) may be

considered in the same way in that they bring together on platform programmes different objects, posing the question of their optimal organisation, in the sense that the user has to some degree acquire the knowledge presented and made accessible by the system.

Initially this article will revisit the principal concepts of instrumental theory and will show how the matter of instrumental conflict arose in the body of theory which it could complete. The main idea is to make a distinction between the three components of a technical system dedicated to teaching, to know, firstly, the content of the discipline being taught, secondly the possible forms for their representation and the scenario for their presentation and, thirdly, the functionalities of the software programme. These three types of components are each the object of a process of adaptation each of which can interfere with the other and produce a conflict.

The second element of this paper will show that the simultaneous presence of

didactical, pedagogical and technical objects presents difficulties in terms of theoretical approaches which relate to situations of computer-supported teaching and learning. This is the case particularly with attempts to analyse pupils' activities in Mathematics using certain software programmes, and also with models which depend upon descriptive norms of pedagogical objects such as can be used in computing. It appears that teachers of Mathematics and computer scientists are both confronted with a similar problem, the fact that the concepts that they each propose tend to cover too diverse a set of realities. In this respect, the concept of instrumental conflict offers the opportunity to describe situations and in a more precise manner than other approaches that might be mentioned.

The subsequent element presents the articulation of an extension to the instrumental approach which is proposed to run alongside the instrumental approaches of teachers of mathematics and computer specialists. It is considered that, without presuming it to constitute a major epistemological leap forward, the concept of instrumental conflict offers greater precision in matters of computer-supported teaching and learning to the extent that it identifies where there may exist a discrepancy between a proposed element of content, a structural format or a presentational scenario and the possible system options for action. In this regard, the developments in pedagogical engineering put into operation for distance learning will gain from this research.

Finally the presentation concludes by suggesting how and in what circumstances instrumental conflict is likely to arise, such that readers interested in this approach can use the concept to their advantage.

II. PRINCIPAL CONCEPTS IN INSTRUMENTAL THEORY

2.1. The Rabardel approach

One of the Rabardel central concepts concerns the instrument, tool or technical object, this being long the subject of considerable interest on the part of the scientific community. According to

Rabardel, the concept generally involves two different facets: the one centred upon the intended function of the instrument in the activity and the other centred upon the activity itself.

Simondon [4] illustrates this first perspective. Simondon established a distinction between instrument and tool. The instrument serves to draw upon information while the tool serves to carry out an action (p. 80). These two dimensions correspond with what he called the technical object. Although taking it in a broader perspective intending to address the relationship between man and his socio-technical environment, he considered that the technical object is always oriented towards the accomplishment of a particular function. He notes: "the beginning of the mediation between the organism and its environment", which heralds the arrival of biological metaphor to explain the concept of instrument. Running counter to this, Guillaume and Meyerson [5], offered a concept of the instrument centred upon activity. They illustrated their conception of the instrument by analysing the use that monkeys make of instruments in their activities. What was important in this latter context was what the subject did with the instrument and the active power that it conferred upon the monkey concerned. For them, the instrument was an intermediary between the subject and the world whereas for Simondon this intermediation existed between the organism and its environment.

Wallon [6] compared the human instrument with that of the monkeys. He wrote taking the perspective of an instrument centred upon an activity, with, in addition, the idea that the instrument enables the accumulated experience to be capitalised upon. That renders the instrument not only an intermediary, but also an experience and a capitalised knowledge. This perspective is also developed by Vygotski and above all Leontiev in their theory of activity. The fundamental aspect to draw from this conceptualisation of the instrument is that it (the instrument) has no significance except in relation to the subject, a subject engaged in the process of producing an activity.

That is the reason why Rabardel proposed a distinction between artefact and instrument. The artefact is a man-made, material object: “in anthropology, the notion of artefact designates anything that has undergone a transformation, however minimal, of human origin” (p. 39 of the translation), whereas an instrument designates “the artefact in situation, inscribed in usage, in an instrumental relation of action to subject as a means of the action” (p. 39 of translation). The instrument is thus the result of the utilisation of a tool [7]. One can thus say that the tool is itself an artefact, and that the term instrument can be used to establish the artefact as a means of realising the activity of the subject. Hence it is the subject who confers upon the artefact the status of instrument.

Another fundamental dimension in Rabardel’s conceptualisation of the instrument is that it cannot be reduced solely to its material nature: the technical object in the Simondon [6] sense of the term. Thus the symbols, the signs, the language and all the intellectual constructions are also instruments, from whence comes a second, symbolic nature which it may take on. In effect, in his conceptualisation of an extended instrumental theory, Rabardel [8] considered only that the representation of

the instrument should not be limited to a particular type of instrument like technical or psychological tools in the sense employed by Vygotski. In this way all constructed material or symbolic objects are artefacts and become instruments in interaction with a subject.

Thus the instrument is considered as combination of attributes in one entity, with two facets relating to subject and artefact. And yet more important, this entity relates also to the subject and society because every instrument has an eminently social dimension. The mode of operation or usage employed by the subject or community refers back to another critical component of Rabardel’s theory, that of instrumental genesis. This results from the dynamics of the subject’s activity and incorporates two processes: (a) - On the one hand, a process of transformation of the artefact in an activity situation is as much a matter of its structure as its functioning - it is instrumentalisation which connects the attribution of a function to the artefact on the part of the subject. (b) On the other, there is the transformation of the subject himself at the cognitive level: this is instrumentation, which consists of the adaptation of the subject’s knowledge to the artefact or in the creation of new knowledge.

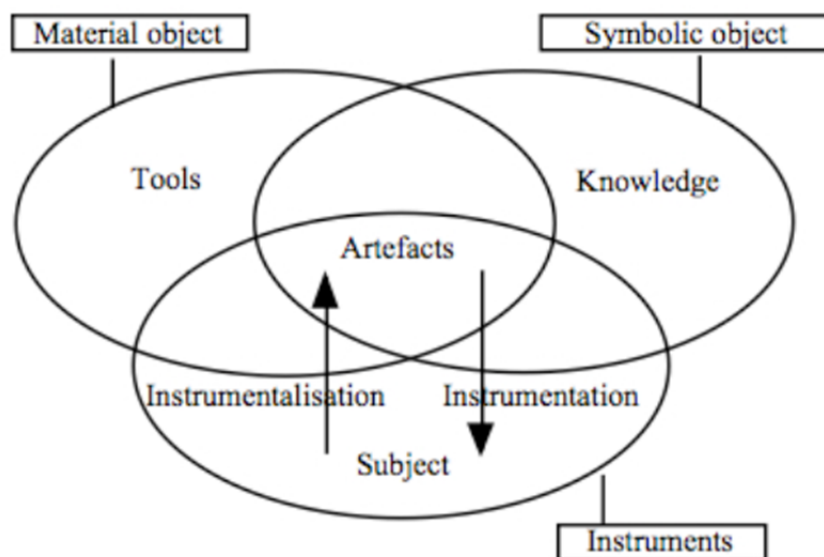


Fig. 1 The concepts of artefact, instrument and instrumental genesis.

These two processes are jointly involved in a reciprocal, two-way relationship. They represent two inseparable dimensions of instrumental genesis.

To synthesise, it is held that constructed cultural objects, be they material or symbolic, possess identical characteristics of which artefacts are made. Whenever a subject interacts with an artefact, an instrument emerges following a phenomenon of instrumental genesis, composed of a process running from the artefact towards the subject (which is instrumentation) and a process running from the subject towards the artefact (which is instrumentalisation) (cf. fig. 1).

2.2. Application to learning and teaching situations

The extension of instrumental theory to symbolic objects as proposed by Rabardel provides the opportunity to consider knowledge in the process of being acquired in learning and teaching situations as much as the artefacts themselves [9]. In all cases, these artefacts need to be sub-divided into didactical artefact and pedagogical artefact. Everyone writing in the field of instrumental theory has to specify that the term didactical is used in a sense far removed from its everyday sense. Here, didactical is neither to be understood in the sense of teaching method, a technical means or a particular pedagogy, nor as the art of teaching.... but rather in the sense of content [10]. In fact for Brun [11] the redefinition of the term didactical contains a willingness to refocus upon the importance of teaching content. It is felt that this brief clarification is warranted to resolve any mis understanding between the terms pedagogy and didactics as the distinction is not always immediately obvious.

Didactical artefact is thus the term used here for all the disciplinary content which needs to be learned in order to become an instrument of the one mastering it. A pedagogical artefact is defined here as being like the formalism for representation and/or the disciplinary content presentation scenario appropriate to its teaching. Formalism for representation is

taken here to mean the semiotic processes of the designation of the didactical artefact, and presentation scenario is taken to mean the presentation of the didactical artefact, also called pedagogical scenario [12].

In distinguishing a didactical and a pedagogical artefactual dimension within knowledge taught, this paper makes the same sort of distinction as does Peraya [13], for whom, each time something is taught, he sees it as being taught within a semiopragmatic context, which understands the signifiers essential to its formulation, and which are situated in a discourse oriented towards the appropriation by the learner of the particular object being taught.

Duval [14] also himself makes a distinction between two aspects of the same element of knowledge. He calls it noesis, a term which he borrowed from Plato and Aristotle, taken to mean the cognitive acts like the conceptual understanding of an object, discrimination of a difference or the understanding of an inference, and he indicates by semiosis the production of a semiotic representation. In the field of linguistics, this conception corresponds respectively to the signified and the signifier. The nature of expression is built upon that raft of signifiers, i.e. that of the form and nature of that which is signified as content [15].

Two families of artefacts are thus present, one being the knowledge ordained by the situation, and the other the discursive setting for learning. In order for one element of knowledge to be effectively acquired by the learner so that, together, they interact as an instrument, it is essential that the learner takes on board both the didactical understanding (content) and the pedagogical (the formalism for representation and/or the presentation scenario). Were one to risk an analogy here: where some would see water, others in fact see one atom of Oxygen and two atoms of Hydrogen which together constitute a molecule of water.

A fundamental principle is thus proposed here that every didactical object is associated to a pedagogical object in a teaching situation. Each of these objects, considered like an artefact, must be

instrumentalised and instrumented suitably by the subject, i.e. that two concomitant phenomena of instrumental genesis have to be in operation. To put this another way, the learner has to attribute the right functions at times to the content and to its formalism for representation and he must also adapt his knowledge and apply it at times to the content and its formalism for representation.

In order to illustrate this didactical and pedagogical duality relating to associated artefacts the example of the multiplication may be used. To help the instrumentalisation of this didactical object one has to typically resort to two formalisms. The first consists in writing in lines and columns the list of results to be recorded (cf. fig. 2a). The second is presented in the form of a double-entry table (cf. fig. 2b).

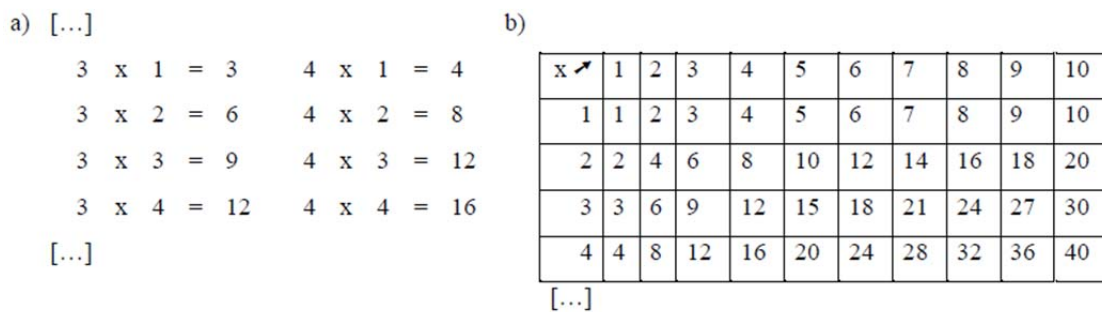


Fig. 2 Formalisms for presenting multiplication tables.

Thus there are the two objects: the one didactical - multiplication, the other pedagogical - be it writing in lines or the double-entry table, which have to be mastered by the pupil at some point in his schooling. The didactical artefact can function very well with one or other of the pedagogical artefacts, and reciprocally, each of the pedagogical artefacts can function very well without the didactical artefact, as is the case when writing on lines is used to represent the results of other calculations, like addition, for example, or when this type of table serves to represent a calendar with which nursery school children are familiar.

their representation, an indispensable condition for better learning. What matters is more the object represented rather than the style or form for its representation, the latter being only ever a means of communication of the object. This point of view postulates that the fact of not distinguishing the content from form leads in the long term to a loss of understanding. The representation of mathematical objects here is then secondary and constitutes a property extrinsic to cognition and the conceptual appreciation of these objects.

In order to complete the matter of the distinction between didactical and pedagogical artefact, it is interesting to reflect upon the follow-up to Duval's work which was considered above, which describes the existence of two postures in the learning of Mathematics: one being of dissociation and the other of non-dissociation. The first posture, corresponding to the distinction already made between didactical and pedagogical artefact, makes the distinction between mathematical objects, being numbers, functions, straight lines, graphs etc, and

The second posture is that of non-dissociation between noesis and semiosis. The field of Mathematics could constitute the primary domain where semiotic representations are indivisible from the objects represented because the possibility of carrying out applications upon mathematical objects could depend directly upon the semiotic system of representation utilised. The analysis of problems in the learning of Mathematics and of the stumbling blocks students regularly come up against suggests that non-dissociation is a fundamental law in cognitive functioning. Not only does semiotic representation serve as a means of communication, but it is also indispensable to activity in

Mathematics. It is, from this point of view, an intrinsic property of mathematical objects.

2.3. Towards a theory of instrumental conflict

The didactical and pedagogical traditions which have arisen owing to the laws and regulations of teaching and consequently since the industrialisation of teaching [16] have progressively determined how the majority of content should be presented in order for it to be assimilated by the greatest number of learners. It is a fact that these traditions are not always a great help when one wishes to introduce ICT into a learning and teaching situation.

In fact, things get even more complicated when didactical and pedagogical artefacts are associated with technical artefacts. For example, a software which teaches multiplication in elementary school is a technical artefact, which, to become a technical instrument has to become a learning object which, in turn, depends upon the instrumentalisation and instrumentation of the user. But as much as it may be a technical artefact, this VLE also brings into play the aforementioned didactical and pedagogical artefacts, which, in their turn, have to be suitably instrumentalised and instrumented in order to become real instruments. That which Peraya [13] terms techno-semio-pragmatic appears similar to what is referred to here as an overlay of three artefactual layers:

didactical, pedagogical and technical. (cf. fig 3).

Thus, the introduction of a technical system may provoke a disturbance of the balance between didactical and pedagogical artefacts, to the extent that the formalisms representation and/or the representation scenarios which were pertinent beforehand are found no longer usable. These disturbances to equilibrium may be termed instrumental conflicts, suggesting that the processes of instrumentalisation and instrumentation of the various artefacts in question can interfere with each other.

In an instrumented teaching and learning situation, the learner-subject is not only a physical, cognitive or social entity in interaction with a technical system, he is equally a subject who is intentionally engaged in the undertaking of his tasks [16]. In the realisation of these tasks, the learner carries out activities which can be both productive and constructive, to the extent that the subject produces a response to the situation and where the task concerned confers upon him an additional cognitive development. Each time one introduces a technical system, one takes the risk that the different levels of instrumental genesis may interfere with one another and deprive the learner at times of the possibility to respond to the situation and of constructing the didactical instrument as envisaged in the particular situation.

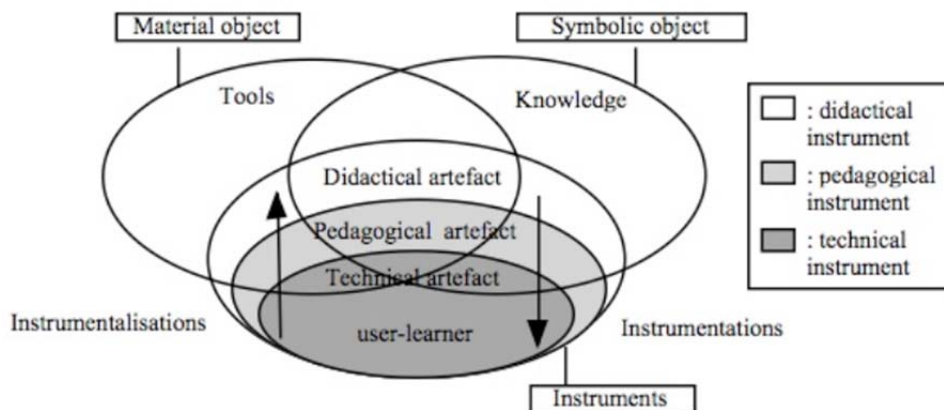


Fig. 3 Relationship of artefacts as sources of instrumental conflict

It is in this combination and usage that learner-users make of didactical, pedagogical and technical artefacts that the optimisation and efficiency of learner activity comes about, be it productive or constructive and the hypothesis is advanced here that failure to produce the anticipated responses results from what may be called instrumental conflict, in other words, the unfortunate association between one or several artefacts which produces a failure in the instrumental genesis of at least one of the three artefacts.

III. IT-BASED DIDACTICAL AND PEDAGOGICAL OBJECTS IN THE TEACHING OF MATHEMATICS

A significant portion of VLEs have been developed by ICT specialists with a view to autonomous learning with the benefit of pre-existing knowledge or competencies [17]. VLE designers not necessarily being teachers or specialist trainers in tutoring learners, the question of the integration and adaptation of these technical artefacts to classic teaching and training practices cannot fail to be posed.

This question is as much, if not more, important than the conception of learning objects, which in the present context of ICT development covers matters which run far beyond the realm of pedagogical engineering. In effect, it is all about normalising teaching content in order to be able to organise it by function relating to the intended learning objectives, given VLE functionalities, the language in which they are presented, the area of knowledge they address, etc. This paper holds to the logic of conception and representation of didactical and pedagogical objects.

Mathematics is the school discipline area where the introduction of VLEs is the most evident, from the very inception of which one often finds a quite animated discourse [18]. According to Guin and Trouche [19], this discourse draws its legitimacy from Piaget's constructivism and is in fact characterised by a twin illusion: (a) That of a naturally positive contribution to

learning: the environment allows one to see and therefore to understand. (b) That of a naturally positive contribution to teaching: this illusion is based upon the principle that the introduction of a VLE results in reducing the cognitive loading upon learners in the resolution of mathematical problems. In effect, the computerised artefacts would lift the technical operations off the learners' shoulders and thereby allow them to focus upon the mathematical objects.

For the IT specialists, putting in place a training structure can be achieved by the successive addition of 'digital building blocks' of different shapes and sizes, which can vary from a simple document right through to an entire training programme. This vision arises from the engineering of pedagogical objects based upon an object-centred approach, also used in the development of software. What is important in this conception is the internal coherence of the technical artefacts operating in the learning context. But in the particular context here technical artefacts constitute the third element, giving rise to the emergence of instrumental conflicts. What, then, does the didactical object actually signify for Mathematics teachers and the pedagogical object for computer specialists?

3.1 Computerised didactical objects as viewed by teachers of Mathematics

A study of the usage of *Dérive*¹ software programme by Lagrange and Drouhard [20] has shown that the pupils did not automatically manage the transition from the technical to the conceptual and that they did not directly access the didactical objects which could be manipulated by the software. In reality, this process did not work to solve every problem and its operation could only be technical because resorting to *Dérive* did

¹ This software programme is just part of the panoply of digital calculation programmes. The originality of *Dérive* lies in the fact that it was conceived as the system covering the broadest possible range of formal calculus. It did not really address a specific teaching need.

not mean by its very use that a better explanation of processes would be achieved.

From this observation Artigue [18] deduced the existence of two phenomena, that of double-reference and pseudo-transparency, in order to explain the integration complexity of a VLE, in this case Dérive, in the context of teaching and learning in Mathematics.

3.1.1 Double reference

The situations observed by Lagrange and Drouhard [20] occurred in two environments: that of the software programme and that of paper-pencil and consisted of factorisations of the polynomial X^n-1 and of trigonometrical calculation. The phenomenon of double reference thus arises from a confrontation of the traditional environment, paper-pencil, and that of Dérive [19].

Artigue [18] thus takes account of the rational factorisation of the polynomial in the penultimate year of highschool: "In the paper/pencil environment the factorisation of the polynomial is linked, at this educational level, to research into real roots [...], to techniques of polynomial division [...]. Dérive's algorithm in the internal workings of the machine worked by intermediary factorisations in $\mathbb{Z}/p\mathbb{Z}$. Evidently these two levels were not accessible to these 17 year old pupils, because Dérive was to function as a 'black box' producer of various results which would be valid a priori" (p. 20). In reality, the fact that the technical system was similar to a 'black box' is not unusual. For example, when pupils use a calculator, they do not have access to the way in which the machine does its calculations. The difference between the factorisation of polynomials situation and that of doing simple calculations with a basic calculator lies essentially in the difference in degree of complexity, which is determined by the teacher.

The author shows that in this case there are two possible interpretations: one

that for the pupils it is a case of bringing forward ideas of factorisation in the classic paper-pencil model with the help of Dérive, and the other in which the pupils would produce results of factorisation coming from Dérive. In both cases, the pupils encounter difficulties. These difficulties result from the computer transposition as Balacheff [21], expressed it, and from constraints associated with such a transfer. This will be addressed further later.

The second observation relates to trigonometric calculus with the help of Dérive. It resulted in the same conclusions being drawn according to which pupils are confronted with simplification difficulties with the software programme. Although the simplifications that Dérive enables are based upon the formulae of classical trigonometry, not least there remains the problem that Dérive's simplifications are difficult to put into practice.

It would appear to be very clear that the integration of a VLE in learning does not make any easier or better teaching and learning situations in mathematics, as the proponents of this discourse would suggest. On the contrary, the computer transposition often comes with constraints which can constitute real handicaps to learning. These constraints thus weaken the mediation capacity of the technical artefact. Under these conditions the software programme no longer plays its role in epistemological mediation such that achieving the didactical objective (in this case the cognitive mathematical objective) is no longer possible.

In her thesis concerning the integration of spreadsheets in algebraic calculations, Haspékian [22] cites evidence of the difficulty teachers have in moving from the traditional paper/pencil environment to the electronic spreadsheet. The difficulty lay in integrating a tool with such variable functions as this. She introduced the notion of instrumental distance which she summed up as "the stronger the degree of instrumentation

when compared with the traditional reference environment (paper/pencil), i.e. the greater the distance from 'habitual scholarly practice', the more the tool will seem difficult to grasp" (p. 296). She demonstrated that in such a situation, a teacher who is not an expert user of the tool can present an additional complexity to the organisation and management of teaching, because the introduction of the spreadsheet, as in this case, implies that new teaching and learning practices be put in place which take full account of the constraints and properties of the spreadsheet.

It is crucial to assert that instrumental distance as measured by the greater or lesser degree of difficulty in integrating the spreadsheet may be translated as the term instrumental conflict used herein, as the notion of difficulty makes reference to the problematic combining of didactical, pedagogical and technical instruments. In effect the use of spreadsheets implies the introduction within the teaching and learning system of new objects, of a new representation, of new functions and significance, thus new symbolisms. The period necessary to master these new capacities is inevitably going to be one of upset and tension: one of disequilibrium in the teaching and learning process.

The double reference appears very similar to the fact that didactical objects such as defined by teachers according to the posture of non-dissociation between noesis and semiosis are transposed by the student: such as paper-pencil for the VLE. The fact even that the notion of double reference should be necessary to explain usage difficulties encountered by students demonstrates the consequences of nondissociation whenever didactical objects are computerised.

3.1.2 Pseudo-transparency

In order to provide an illustration of the notion of pseudo-transparency an example drawn from the work of Guin and Trouche [19] will be adopted, as borrowed

from Artigue [18]. He defined this phenomenon as the gap between what is written by the student and that which is shown on the screen: "to enter $(a+2)/5$, certain pupils, having correctly added the pair of brackets around the $(a+2)$, were astonished to find their screen showing the data without brackets and asked if what they had done was right or not. The appearance and disappearance of brackets seemed, to some of the students, to be playing a rather mysterious game which they little understood such that they could not work out what brackets were supposed to be about". (p. 64)

Artigue [18] points out that the Dérive interface did not at a stroke enable students to alter the length of the line between the upper and lower elements of a fraction which they could do all too easily by hand. And yet this information is necessary as it allows students to know where the line in a fraction should go. There is in this a constraint linked to the fact that the keyboard only provides for one keystroke for division. There is unarguably a discrepancy produced by the transition to computer between the traditional didactical object and the computerised didactical object: this is the phenomenon of pseudo-transparency.

This situation represents an obstacle to the identification of mathematical symbols whose function is precisely to enable pupils to develop their capabilities in Mathematics. The lack of the facility to be able to produce these lines with the Dérive software programme is an example of a situation in which the introduction of a VLE is responsible for introducing a disequilibrium in the learning process. As symbolic representations, the lines in a fraction, which here are taken as pedagogical objects, only have one role, which is to assist in the resolution of the mathematical problem. They are also a means of more clearly identifying a mathematical object critical to conceptualisation [23]. This aspect is very

much in line with a case which in the field of conceptual theory, Vergnaud [23] considered as a rupture of cognitive development. This research, however, considers such a disequilibrium caused by the Dérive environment as being instrumental conflict, as the failure in the implementation of the pedagogical artefact and the line between the two components of a fraction act against the pupil's way of working and thus prevent him from coming to an understanding or of appreciating significance, i.e. from the didactical artefact.

This example of pseudo-transparency provides the opportunity to confirm the existence of a semiotic non-conformity between the traditional and VLE environment. The fact that showing brackets was simply not possible on the Dérive interface or that the keyboard could not be given specific functions enabling the writing of differentiated signs of lines duly adapted to a perfect and complete representation of the mathematical contents of division served to disturb the majority of pupils. Such ambiguities could also arise without the use of a computer, but they are normally well dealt with by teachers who can most easily resolve the disequilibrium between the formalisms of representation, that is to say between the semiotic registers and cognitive objects. Dérive here creates a disequilibrium which concerns the pedagogical artefact (in this case the line in the fraction or division) and thus the formalism of representation of the didactical artefact which can also create difficulties for the teacher without good anticipation on his part.

It would seem that, beyond the perspective offered by Artigue [18] in proposing this notion of pseudo-transparency as a means to study semiotic non-conformity between the traditional paper-pencil context and that of a VLE in a transposition to a computerised situation, the real problem is to take account of the possible deformation of didactical objects as it arises from the use of

technology no matter how well conceived it may have been.

3.2. Computerized pedagogical objects as viewed by computer specialists

It is interesting to note that computer specialists' thinking regarding pedagogical objects emerged at the same time as the advent of VLEs. The term pedagogical object, synonym of learning object, only makes sense in relation to the latter. This object-oriented approach has gone through three successive phases, which were crystallised in norms: LOM [24], SCORM [25] and EML [26]. It should be recalled before moving on that these three models of pedagogical artefact correspond to three drivers (respectively economic, technical and pedagogical) which preside over object conceptualisation. Moreover, what computer specialists call objects are in reality artefacts in as much as they are not embodied in a VLE and in interaction with a userlearner, they remain symbolic constructions fixed by digital processes.

Pernin [27] highlights the lack of consensus as to the definition of a pedagogical object, and this despite the definition given to it by the work group IEEE-Learning Technology Standards Committee. In effect for the IEEE-LTSC a pedagogical/learning object is defined as "any entity, digital or otherwise, which can be used or referenced in training provided by a means of technological support". Looked at more closely, the definition which computer specialists give of the pedagogical object is not too far from this. For David [28] a pedagogical object is a digital document allowing the learner to get engaged in an autonomous learning activity regardless of the context of object utilisation. Put another way, it has to be reusable in all learning contexts.

But in order for a digital object to stake a claim to being a pedagogical object, its conception has to integrate the recommendations of pedagogical activity. The model object to which he makes reference is that which complies with the LOM norm specifications, the structure of which is based upon four levels comprising the course, the lesson, the curriculum and

the media. This latter component is supposed to enable a replication of the granular structure in all technological learning environments. What is central to the conception of this model is its characteristic of reusability. It is very much a vision which gave rise to the concept of the inter-operability of VLEs, according to which digital resources have to be able to be compatible with the technical structures where they are likely to be used. However, the LOM model has not enabled convenient and 'universal' inter-operability to be achieved.

Another very computing-based conception of the concept of the pedagogical object is provided by Contamines, George and Hotte [7]. It must be borne in mind all the time that these authors did not use the term pedagogical object but that of educational resource, covering a great variety of learning objects. Beyond the indisputable relevance and interest that can be accorded to their work, it is no less well founded than the meaning - of the rest borrowed from Klassen [29] focusing upon four points - which they give to pedagogical objects, which serves to increase the confusion which reigns around the definition of pedagogical objects. For them, an educational resource is an 'atomic' entity, a video clip or a web page for example. It is also of a composite nature and refers to a non-dissociable whole (didactical multimedia) or an assembly of learning objects (p. 161). It is appropriate to note that this ambiguity concerning pedagogical objects can on the part of learners themselves lead to a situation in which they have altogether different ideas of what constitutes a pedagogical object.

If the construction of the LOM model has not offered much satisfaction in respect of its own expected constituted functions, that is to say the reutilisation of pedagogical objects in all VLEs, one can nevertheless recognise that the SCORM model represents progress in the computing conception of pedagogical objects. It concerns a model by Pernin [27] composed of three well-identified levels: (a) The first is that of the basic digital resource, such as an image: JPEG or GIF, a WAV or MP3 sound file, a

Web page etc. (b) The second level is termed intermediary. It constitutes of a coherent grouping of basic digital resources capable of being shared amongst learners on a distance learning platform. At this level the system allows control of the carrying out of learning activities. It makes possible the provision of information on resources utilisation and the carrying out of activities on the platform by the key players. (c) The third level is that of the bringing together of the content. This provides a coherent structuring of content at the core of an entity deemed of higher level, like a course, chapter or module.

The LOM and SCORM models, let it be remembered, serve to facilitate the orientation and indexation of pedagogical objects, and precisely apply this role of the pedagogical object to very diverse entities. The principal consequence of this is that one cannot discern between a pedagogical object and a didactical object, such that this research is left to attempt to do it by separating that which relates to the disciplinary content taught from the formalism of representation or presentation for teaching purposes. This lack of discernment would appear to reside in the fact that the central aspect of the object-oriented approach relies less upon learning activity than upon computing artefacts. In effect, these models consider elementary artefacts to be just as much pedagogical objects (although they are located at different levels), such as images, web pages, content structures, courses, lessons and modules. Yet it would seem necessary to make a distinction between pedagogical artefacts which can be considered as scenarios and formalisms which serve to present the didactical artefacts which are the contents of learning.

IV. RELEVANCE OF THE CONCEPT OF INSTRUMENTAL CONFLICT

The concept of instrumental conflict draws its relevance from the generalisation of the use of ICT in teaching. As it has been noted earlier in this paper, the introduction of a VLE might disturb the very equilibrium of a classical teaching situation, in which the didactical artefacts can be conveniently

combined with their pedagogical artefacts, so that they can be instrumentalised and instrumented by the learners, and so that they thus become socially useful instruments. But the evidence provided herein would seem to indicate clearly that the two scientific communities interested in ICT in teaching are coming up against difficulties in identifying didactical objects and pedagogic objects when they are in computerised form.

4.1. Further notions concerning related objects

For teachers of mathematics, the notions of double-reference and pseudotransparency take account of the fact that accessible didactical objects in some software programmes do not always work for their pupils whether it be relating to their paper-pencil representation or in accommodating the constraints imposed by the user-interface. From an instrumental perspective, the difficulties encountered by pupils are an inadequacy in the combination of didactical artefacts which are the mathematical objects and pedagogical objects, i.e. their formalisation by mathematical signs in a computerised

environment. Although it is always useful to represent mathematical objects by several semiotic systems, what is clear from the classical form of teaching can reveal itself to be that much more difficult, even impossible when a technical artefact is introduced.

For computer specialists, the notions of granularity and inter-operability enable the LOM and SCORM indexation norms to deal with the variety of pedagogical objects that they would seek to describe, but also to conceptualise the difficulty brought about by the absence of a distinction between the pedagogical object as such and its integration within a technical system. Everything happens as if (and this would seem both accurate and to be the norm) the mathematics teachers could not easily computerise certain of their didactical objectives, for lack of ability to conceptualise the dissociation between the taught content and its formalism of representation or its presentation for teaching purposes, and as if the computer specialists could not suitably put pedagogical objects into a teaching mode by reason of also not being able to make the same distinction.

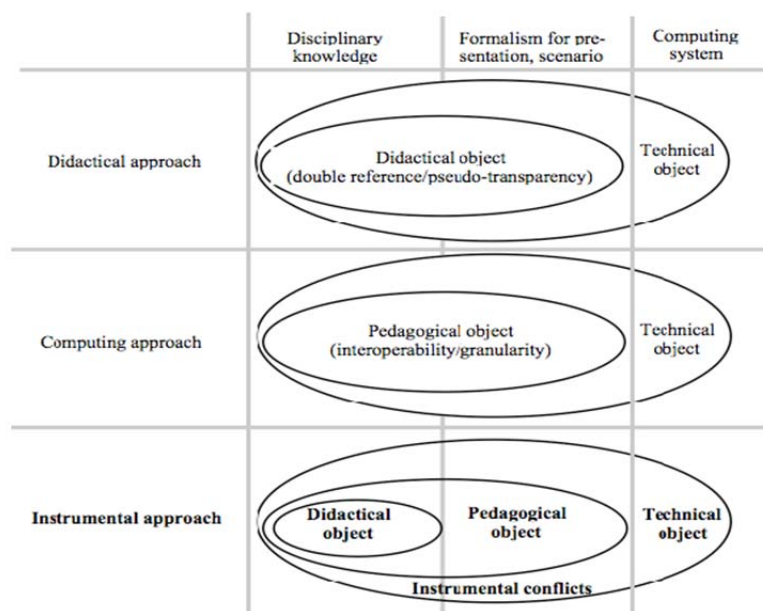


Fig. 4 Distinction between didactical, pedagogical and technical objects according to existing approaches.

In a way, teachers of mathematics and the computer-specialists are giving two different names to the same objects and are in need of further objects to account for the difficulties posed by their respective nomenclatures (cf. fig 4). Instrumental theory and the separation that has been introduced here between didactical objects, pedagogical objects and technical objects provides the opportunity to unify these two conceptions of the integration of ICT in teaching.

The distinction between didactical objects, pedagogical objects and technical objects is not just an exercise in rhetoric which will depend upon conceptual common ground between the teaching of mathematics and computers science applied to VLEs. In fact, if the term object has been used here for the purpose of clarity, it is important to specify that these objects, from an instrumental perspective, are, in reality, artefacts which become instruments in interaction with a subject. Moreover, it is the simultaneous instrumental genesis of these types of artefact which can cause difficulty, difficulties which here have been termed instrumental conflict.

4.2. Usefulness in distance learning and pedagogical engineering

The concept of instrumental conflict would appear to be useful in the analysis of current developments in distance education although the action modalities are different from the classic classroom teaching one, even with a VLE included. In fact, in the foregoing, and equally in the conception of mathematics teaching as in the object-oriented approach, it has been seen that the computerisation of learning and teaching is determined more by the objects of knowledge than by learning activity.

In the field of distance education the activities have a central place. This change in perspective calls indisputably for another approach to the conceptualisation of artefacts operating in various situations. For example, the EML (Educational

Modelling Language) developed by Kopper [26, 30] which is at the origin of the IMSLD² [31] presents a real leap forward in the pedagogical realm when compared to the LOM and SCORM models already addressed above. This language for pedagogical modelling identifies several types of activity amongst which are learning activities, student support activities and instrumentation activities [27].

This refocusing upon the activity is becoming common while designing distance learning platforms. The majority of VLE platforms draw upon a representation of learner function or teaching model, the object of which is to enable isolated learners, because they are operating at distance, to get on effectively with their learning activities [32]. This effectiveness naturally depends upon the support to which they are entitled, but also and, perhaps above all, upon the combination of didactical and pedagogical artefacts which, after a certain fashion, are seeking a pedagogical engineering approach. The concept of instrumental conflict can at this point be put to the service of practices in pedagogical engineering which have been developed in 2 IMSLD: Instructional Management System Learning Design. distance education [33] and contribute to the attainment of specific pedagogical objectives, notably in its capacity of accounting for the imperfection of associations between artefacts.

The concept of instrumental conflict can also be called upon in the evaluation of the introduction of ICT in the practice of teaching and learning. In fact, the recourse to computer-based solutions in the context of pedagogical innovation has often been accompanied by a fierce and impassioned discourse more typical of the political or economic spheres than the pedagogical. As a result, it is not at all unusual that there is a gap between the expected benefit of the introduction of these computer-based

² IMSLD: Instructional Management System Learning Design

artefacts and the actual impact in teaching and learning situations. Having a concept of instrumental conflict enables the review of possible inadequacy in the articulation of didactical, pedagogical and technical artefacts where ICT is involved. In enabling the failure of instrumental genesis to be identified, this concept offers the opportunity for the adjustment of one or more of the artefacts concerned in such a way as to ensure their harmonisation with the learning outcomes desired.

V. DISCUSSION

Although it is agreed with De Vries and Baillé [34] that bringing together other existing theory can offer support to the concepts of VLEs and describe the mechanics of learning in action, this paper has attempted to demonstrate the value of reflecting upon the concept of instrumental conflict in order to explain certain dysfunctions in computer-based teaching and learning situations, and in so doing, has tried to help avoid user problems in a distance learning pedagogical engineering approach.

Instrumental conflict only applies in the case of instrumental theory, the principal elements thereof being addressed herein, and identifies interferences between the simultaneous processes of the instrumental genesis of didactical artefacts (disciplinary content), pedagogical artefacts (formalisms of representation and presentation scenarios) and technical artefacts (VLEs, platforms). The main argument, which is singled out from prior analyses of computer-based teaching and learning situations, lies in the explicit distinction between the three families of objects which can bring about an instrumental conflict in many possible forms.

The first of these manifestations and without doubt the most usual is what has been termed a rupture in the equilibrium between a classical situation and an instrumented one. This happens when

combinations of didactical and pedagogical artefacts, tried and tested by academic tradition, find themselves no longer to be properly instrumentalised and instrumented once embodied in a technical system. This can come about each and every time that the disciplinary content is delivered within a VLE without modification being made to its presentation format or its role in learning. How many supposed e-learning solutions turn out to be barely disguised slides or photocopies reformatted for the menu systems? No matter how much care has gone into the taught content, the computerisation of such matters requires that the learning and teaching scenario be adapted, in order that it can work with the constraints imposed by the system. In the absence of such precautions, the addition of a technical artefactual layer to a relevant combination of didactical and pedagogical artefacts is bound to lead to instrumental conflict. This is what Lagrange and Drouhard [20] identified in their research into the use of the *Dérive* teaching software, although they didn't call it this.

The second type of manifestation of instrumental conflict corresponds with what can be observed when disciplinary content has not been suitably adapted to the generic application which diffuses it. This is the case, and unhappily it is not altogether rare, when a distance education platform not only imposes its own functionalities, but also forces a particular pedagogical scenario. In effect, a certain number of LMS (Learning Management Systems) are built around modes of organisation of pedagogy which do not suit all academic disciplines or all professional training contexts. These modes of organisation of pedagogy cover a broad range, which extends from the downloading of files to print and be read in complete seclusion to systems of collaborative learning with tutor support and computer sessions. Neither these extremes nor the possibilities between are, a priori, good or bad. They can become one or the other depending upon the functioning

of the content presented when they fail to accommodate the nature of the teaching concept and the learning vehicle provided by the platform.

The third and final manifestation of instrumental conflict comes about when a technical system dedicated to a family of didactical objects is inappropriately used by the learner or the trainer. In this instance, neither the contents involved nor the VLE functionalities are to blame, but rather the pedagogical expertise of the teacher. This happens, for example, when teachers are delivering sessions on dynamic geometry in relying upon scenarios developed for paper-pencil geometry. In doing this, pupils cannot access the properties of the geometric objects that the software emphasises, since it is precisely these properties that are not updated in the same way in relation to how the software is used or how one produces figures by hand.

From the moment that one of the didactical, pedagogical or technical artefacts is not in place, or, to put it another way, is not in harmony with the two others, the processes of instrumentalisation and instrumentation necessary for the construction of knowledge risks becoming the object of instrumental conflict.

This represents the sum total of the knowledge arising from this research which can be passed on and applied to the computer-based teaching and learning situations which have been investigated, in so far as care can be taken to bring together in an optimal arrangement, content, formalisms and functionalities and to verify them by means of studies of actual use.

REFERENCES

- [1] BRUILLARD, É. (2004). Apprentissage coopératif à distance : quelques repères sur les questions de recherche, in SALEH, I., BOUYAHI, S., (Eds), *Enseignement ouvert et à distance : épistémologie et usages*. Paris, Lavoisier, 115-125.
- [2] LINARD, M., (2001). Concevoir des environnements pour apprendre : l'activité humaine, cadre organisateur de l'activité technique, *Sciences et Techniques Educatives*, 8, 3-4, 211-235.
- [3] RABARDEL, P. (1995). *Les hommes et les technologies, Approche cognitive des instruments contemporains*. Paris, Armand Colin. An English translation of his seminal work can be found at: http://ergoserv.psy.univ-paris8.fr/Site/default.asp?Act_group=1 Accessed June 17, 2011.
- [4] SIMONDON, G. (1989). *Du mode d'existence des objets techniques*. Paris: Aubier.
- [5] GUILLAUME, P., MEYERSON, I. (1937). Recherches sur l'usage de l'instrument chez les singes : choix, correction, inventions, *Journal de Psychologie*.
- [6] WALLON, H. (1941). *L'évolution psychologique de l'enfant*. Paris, Armand Colin.
- [7] CONTAMINES, J., GEORGES, S., HOTTE, R. (2003). *Approche instrumentale des banques de ressources éducatives, Sciences et Techniques Educatives*, Hors Série, 157-177.
- [8] RABARDEL, P. (1999). Le langage comme instrument ? Élément pour une théorie instrumentale élargie, in CLOT, Y. *Avec Vygotski*, Paris, La Dispute, 241-265.
- [9] MARQUET, P. (2004). *Informatique et enseignement : progrès ou évolution*. Liège, Mardaga.
- [10] PORTUGAIS, J. (1995). *Didactique des mathématiques et formation des enseignants*. Peter Lang, Paris.
- [11] BRUN, J. (1975). A propos de la didactique des mathématiques. *Math-Ecole*, 100-101, 14-20.
- [12] PAQUETTE, G. (2002). *L'ingénierie pédagogique, pour construire l'apprentissage en réseau*. Montréal, Presse de l'Université du Québec.
- [13] PERAYA, D. (2000). Le cyberspace : un dispositif de communication et de

- formation médiatisée. In ALAVA, S. (Ed.), *Cyberespace et formations ouvertes. Vers une mutation des pratiques de formation ?* Bruxelles. De Boeck, 17-44.
- [14] DUVAL, R. (1995). *Sémiosis et pensée humaine, Registres sémiotiques des apprentissages intellectuels*. Paris, Peter Lang.
- [15] BARTHES, R. (1985). *L'aventure sémiologique*. Paris, Seuil.
- [15] MOEGLIN, P. (2005). *Outils et médias éducatifs. Une approche communicationnelle*. Grenoble, PUG.
- [16] RABARDEL, P., SAMURCAY, R. (2006). De l'apprentissage par les artefacts à l'apprentissage médiatisé par les instruments, in BARBIER, J.-M., DURAND, M. (Eds), *Sujets, activités, environnements. Approches transverses*. Paris, PUF, 31-60, PUF.
- [17] PERNIN, J.-P. (2006). LOM, SCORM et IMS-Learning Design : ressources, activités et scénarios. Babel-edit., L'indexation des ressources pédagogiques (Journées d'étude du 16/11/2004 ENSSIB).
- [18] ARTIGUE, M. (1995). Une approche didactique de l'intégration des EIAO à l'enseignement, in GUIN, D., NICAUD, J.-F., PY, D. (Eds), *Environnements Interactifs d'Apprentissage avec Ordinateur*, Paris, Eyrolles, tome 2, 17-28.
- [19] GUIN, D., TROUCHE, L. (2001). Analyser l'usage didactique d'un EIAH en mathématiques : une tâche nécessairement complexe, *Sciences et Techniques Educatives*, 8, 1-2, 61-74.
- [20] LAGRANGE, J.-B., DROUHARD, J.-P. (1995). *L'intégration du système de mathématiques symboliques DÉRIVE, une évaluation didactique auprès des élèves de 14 à 19 ans*, in GUIN, D., NICAUD, J.-F., PY, D. (Eds), *Environnements Interactifs d'Apprentissage avec Ordinateur*, Eyrolles, Paris, tome 2, 327-338.
- [21] BALACHEFF, N. (1994). La transposition informatique. Note sur un nouveau problème pour la didactique, in ARTIGUE, M. et al. (Eds), *Vingt ans de didactique des mathématiques* en France, Grenoble, La Pensée Sauvage, 364-370.
- [22] HASPEKIAN, M. (2005). *Intégration d'outils informatiques dans l'enseignement des mathématiques. Étude du cas des tableurs*, thèse de doctorat, Université Paris 7.
- [23] VERGNAUD, G. (1991). *La théorie des champs conceptuels, Recherches en Didactique des Mathématiques*, 10, 2.3, 133-170.
- [24] IEEE-Learning Technology Standards Committee (2006). *Learning Object Metadata*, <http://ltsc.ieee.org/wg12> Accessed June 17, 2011.
- [25] ADVANCED DISTRIBUTED LEARNING (2006). *SCORM*. <http://www.adlnet.gov> Accessed June 17, 2011.
- [26] KOPPER, R. (2001). *Modelling units of study from a pedagogical perspective. The pedagogical meta-model behind EML*. Draft document, Heerlen, Open University of the Netherlands, <http://eml.ou.nl/introduction/docs/ped-metamodel.pdf> Accessed 26 January, 2007.
- [27] PERNIN, J.-P. (2003). Objets pédagogiques : unités d'apprentissage, activités ou ressources ? *Sciences et Techniques Educatives*, Hors Série, 179-210.
- [28] DAVID, J.-P. (2003). Modélisation et production d'objets pédagogiques. Une approche par objet pédagogique, *Sciences et Techniques Educatives*, Hors Série, 69-94.
- [29] KLASSEN, P. (2000). *Architectures for learning object repositories*, Congrès annuel du réseau des centres d'Excellence en téléapprentissage, Toronto.
- [30] KOPPER, R., TATTERSALL, C. (2005). *Learning Design: A handbook on*

- modelling and delivering networked education and training.* Berlin Heidelberg, New York Springer, 2005.
- [31] IMS Global Learning Consortium, Inc. (2003). *IMS Learning Design Best Practice and Implementation Guide*.
www.imsproject.org/learningdesign/ldv1p0/imsld_bestv1p0.html Accessed June 17, 2011.
- [32] LEGROS, D., MAITRE DE PEMBROKE, E., TALBI, A. (2002). Les théories de l'apprentissage et les systèmes multimédias, in LEGROS, D., CRINON, J. (Eds), *Psychologie des apprentissages et multimédia*, Paris, Armand Colin, 23-39.
- [33] CARRE, P. , CLENET, J. , D'HALLUIN, C. , POISSON, D. (1999). *Ingénierie pédagogique et formation ouvertes*, in CARRE, P., CASPAR, P. (Eds) *Traité des sciences et des techniques de la formation*, Paris, Dunod.
- [34] DE VRIES, É, BAILLE, J. (2006) *Apprentissages : référents théoriques pour les EIAH*. In GRANDBASTIEN, M., LABAT, J.-M. (Eds). *Environnements Informatiques pour l'Apprentissage Humain*, Paris, Hermes-Lavoisier, 27-46.

THE QUALITY OF STUDENTS' SOCIAL COMPETENCY OF EDUCATIONAL EXPERIENCE PROGRAM IN VOCATIONAL SECONDARY SCHOOLS

Suparman¹, Galeh NIPP², Dwi W³

Faculty of engineering, Yogyakarta State University^{1,2,3}

e-mail: suparman@uny.ac.id

ABSTRACT

Education that aims to achieve teachers competence in the field of professional and pedagogical is already systematically planned through courses in a curriculum. Meanwhile, the achievement of social competence is obtained through the integration in the subjects and extracurricular activities. However, education for achieving social competence of prospective teachers have not planned systematically in both content and way to achieve it. The purpose of this research is to determine the social competence of prospective teachers who perform the educational experience program (PPL) in vocational high schools (SMK). This research population are students who are taught by PPL students of Engineering Faculty, Yogyakarta State University in 2016. The research sample is selected by multi stages. Samples consist of SMKN 3 Yogyakarta. A total sample of 237 students were determined by quota. Samples were randomly selected at each school based on expertise program. Data were collected by questionnaires and cross-checked through interviews and observations. Data were analyzed quantitatively. The results showed that the average of social competence of engineering students who have completed educational experience program at SMK is included in the category of good. In detail, (1) indicators included in category of very good are social competence in class including skill to manage difference in opinions; (2) indicators included in category of good are communication skills in teaching, approaching students skills in teaching, empathy skills in teaching, adjusting skills in teaching, communication skills in schools, collaboration skills with the school community, empathy skills outside the classroom, self-adjustment and organizational skills.

Keywords: social competence, practise of field experience, vocational high school

I. INTRODUCTION

The development of globalization demands all products and services that having standard that acceptable in the global market, including in this is the product services professional teachers. A teacher is very importance in their function as the change of catalyst in the aspect of scientific and moral (Suyanto, 2007). The aspect of scientific, teachers can convey the science that owned through the learning. The science which delivered teachers must be able to support the development of the potential, knowledge, and skills of student in order provision his life and development the people. A moral aspect, teachers should be an example and could deliver something to their students about personality, attitude and good moral.

Martin Luther King said that, "intelligence plus character that is the goal of true education ", it means; intelligence plus character. This is the end of goal from

actually education. While Theodore Roosevelt said that: "to educate a person in mind and not in morals is to educate a menace to society" it means; educates someone in the aspect of intelligence the brain and not a moral aspect is a threat that dangers to the community (Ghazali Bagus Ani Putra). The second opinion shows that moral education in school is very important includes education personality (intrapersonal) and education of the social (interpersonal).

Teacher training was aiming to produce teachers fulfilling the criteria in accordance with the act the national education system. There were four competences that should be owned by teachers namely professional competency, pedagogical, personality, and social. Education to reach competence of teachers in the field of professional (matter fields of expertise), pedagogical (strategy for the

delivery of material expertise) was already planned systematically through lecture. Meanwhile, education to reach competence social not planned systematically. Competence it is hoped that formed through integrated in lecture and extracurricular activities. The problems, do the competence of social students teacher in practice experience (the educational experience program) it qualified at least?

Ghazali Bagus Ani Putra said that one of indicators human moral character is having social skill, that having sensibility high social order to be able to give priority to the interests of others. This is apparent from social relations harmonious, same opinions by Purwanto, that competence for social teachers are competence the field of relations and service/devotion to the community. Teachers should be able to communicate with others, able to solve problems, and serve the public interest (Purwanto, in Hujar AHS).

Suranto (2011: 27) said that human relationships (interpersonal) are characteristic of social life which requires every individual to build a relationship with the other, so will be interwoven a bond which is reciprocal feelings in a pattern of relationships. Interpersonal relations in the

broad sense are the interactions performed by a person to another person in all circumstances and in all areas of life, so that leading to happiness and satisfaction on both sides.

Competence social teachers according to the Indonesian Government No. 19, 2005 at explanation article 28 the letters D is the ability educator as part of the society to communicate and they blend effectively with student, fellow educator, staff, parents/student guardian, and the society. Communication principal and associate teacher according to government regulation was effective. Communication effective is communication and promiscuity having a positive impact on student, fellow educator, staff, parents/student guardian, and the society. Conversation skills according to Mohamad Surya (2013: 337-342) there was eight which are: (1) skill collaboration, (2) skill empathy, (3) skill summarizes, (4) skill ask, (5) skill honesty, (6) skill assertive, (7) skill confrontation, and (8) skill problem solving.

Meanwhile, social relationships between teachers and students according to Wubbels And Brekelmans (2005) is as follows the Figure 1:

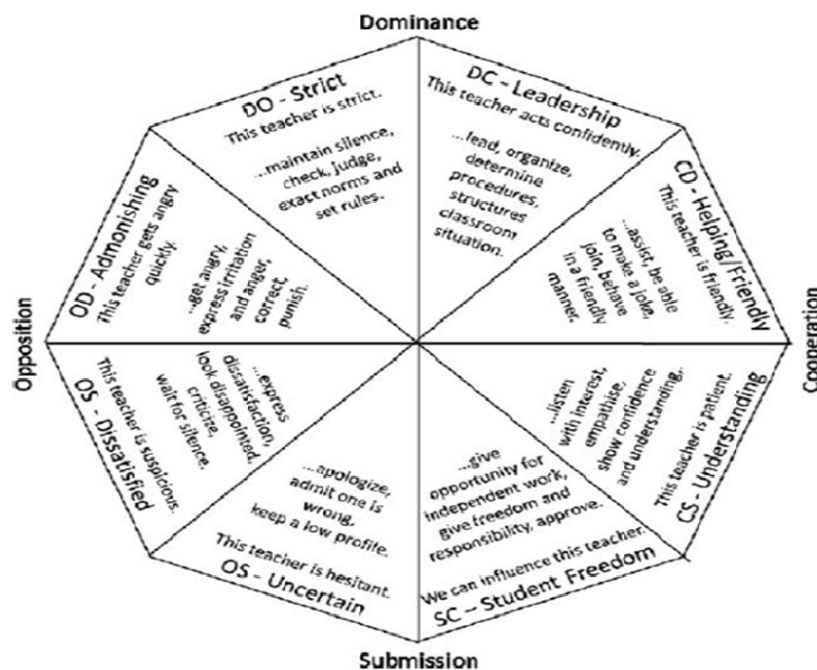


Fig 1. Social Relationships (Wubbels and Brekelmans, 2005)

In the picture above, relations interpersonal visible there are eight aspects relations interpersonal: admonishing behavior, strict behavior, leadership behavior, helping/friendly behavior, understanding behavior, student responsibility/freedom behavior, uncertain behavior, and dissatisfied behavior. When viewed as a broad outline, relations according to wobbles there are four the axis with each the axis two the opposite pole. The axis one is leadership teachers steady VS uncertainty, the axis two are teachers loved to help VS teachers do not satisfied, the axis three are teachers be careful VS teachers irritable, and to the axis of four are teachers teacher had discipline VS give freedom. Competence social as a candidate a good teacher lies not in extreme polars, but also did not in the center. Should social attitudes teachers are approaching the positive pole and away from the negative pole.

The research conducted by Lilis (2014) in SMKN 2 Yogyakarta among others concluded that "relations Interpersonal teacher-students class XII package expertise technique picture building in SMKN 2 Yogyakarta in academic of year 2013/2014 be in category good. This means that input students already has competence social good, but do most students from high school whos others had in their students with competence social good?"

Suparman with and friends (2015) in his study concluded that average of competence social students the entered the year of 75,99 at 2012, the 2013 of 74,30 and the 2011 at 73,60. Despite everything going in the category of good, but the average of competence social students the 2012 (the first half 5) it is higher than the 2011 (the first half 7) who was just finishing following the practices field experience. Showed that education social done in UNY has not provided an increase in competence social his students.

Meanwhile, research professor about the relationship with students done Samsulhadi with and friends (2013) the a population of students Faculty of Engineering, Yogyakarta State University include concluded that at the positive the result was high and at the negative had a

low. This means that relationship with student interpersonal lecturer Faculty of Engineering, Yogyakarta State University lecturers is an education example social relations good. Research suggests that competence on social lecturer and teachers apparent is good. But education social competences in Yogyakarta State University for the teachers have not showed significant influence.

Education to reach competence social teachers can be done of your class or out class, it is important to the example of educator. Bandura (Fiest, 2006) in theory cognitive maintained that the human flexible enough were able to studies various skill be and behaving, where point learning best is the vicarious experiences. The act of observing make room for people to learn without do anything. People can see natural phenomena, herbs, animals, a waterfall, movement months, star and so on, but a more important for the theory cognitive social bandura is looking the conduct of others.

Castorina & Gil Anton (1999) in his study concluded that: (1) The children assume an intentional reciprocity with other institutional actor, teaches and head teacher, (2) the normative meaning of authority are not directly expressed, but through the mediation of the symbols of authority, (3) the children's search for the meanings of the prescription is supported by the meanings of possible actions of the authorities for them.

The results of the study Castorina shows that if educators and his superior concern the students, prestige educators and his superior is the symbol of the power educators and their superior, the application of power educators and his superior be the centre of interest their students. Thus, all attitude, utterance, and behavior educators and his superior is a source of learning for their students whether it is your class and out class. If utterance, attitude, and behavior it has to with social, it was possible students obtain lessons learned social.

The competence society is one of the requirements of a teacher who prepared in education teacher cadet. During this preparation education social "ignored" and is very important in develop the character of

students at school. The candidate teachers supposed to have competence social better than the profession another in the results of educated at a school can be achieved with good. Teachers should be able to set an example with a new relationship social against whom fine in the community and the vicinity of the school, good in the classroom and outside the classroom.

The social relationships teachers with students, fellow educator, staff, parents school tuition and people should effective, it means have to give positive value in education, do not until only for the benefit of teachers alone. And social relationships that both for teachers with students of in the class is according to a model put forward by Wubbel and Brekelmans and Mohamed solar system that principle is effective or positive to the development of student learning.

Competence social teachers can arranged according to the location of the communication and promiscuity which are: (1) into a class (teachers with students), (2) outside a class (teachers with staff, teachers and possible with parents of students) and (3) in the community (teachers with parents of students and society).

II. METHOD

The methods of research is descriptive quantitative. The research is based on opinion students vocational high school who taught by students from Faculty of Engineering, Yogyakarta State University. The object of this research is competency social students Faculty of Engineering, Yogyakarta State University. The object of this research is students SMKN 3 Yogyakarta which taught by object of this research. Population this study were students SMKN 3 Yogyakarta who had by students the educational experience program Faculty of Engineering, Yogyakarta State University.

The samples are 237 students determined by table Krijcie-Morgan. The samples are determined by proportional in program expertise. The building engineering is 92 students, the mechanical engineering is 33 students, the information engineering is 33 students, the computer engineering is 32 students, the electrical engineering is 33 students and the automotive engineering is

14 students. Next each program sample expertises were randomly. The technique collecting data is to chief later in cross-checked through interviews and observations.

III. RESULT AND DISCUSSION

The discuss consist of (1) the competency social students educational experience program Faculty of Engineering, Yogyakarta State University in SMKN 3 Yogyakarta as a whole, (2) the competency social students educational experience program Faculty of Engineering, Yogyakarta State University in SMKN 3 Yogyakarta in teaching and outside class, and (3) the competency social students educational experience program Faculty of Engineering, Yogyakarta State University in SMKN 3 Yogyakarta according to the indicators. The sample research is 237 of chosen by 49 grains about, the frequency of students who said was much less as many is 4,05%; said less is 25,36%, said good is 47,31%, and answer very good is 23,28%, with to scatter frequency a score above, mean a score is 2,90. The competency social students Faculty of Engineering, Yogyakarta State University overall in the category is good.

Meanwhile, the social competency students in teaching of your class the spread is: frequency students who said was much less as many is 4,57 %, said less is 25,75 %, said good is 46,02 %, and answer very good is 23,66 %, with to scatter frequency a score above, mean a score is 2,89. The competency social students Faculty of Engineering, Yogyakarta State University in teaching of your class in the category is good. The competency students out class in scope school is: frequency students who said was much less as many is 0,95 %, said less is 15,72 %, said good is 50,95 %, and answer very good is 32,38%, with to scatter frequency a score above, mean a score is 3,15. The competency social students Faculty of Engineering, Yogyakarta State University in teaching of your class in the category is good.

The competency social students in teaching mean the score lower than social class competence. The result of this research reasonable like this because they were in

observing competence students the educational experience program more focused and with relatively a long time your class than out class. Your class student could significantly is observing social skills students the educational experience program. Students understand behavior students the educational experience program was acting teaching, what students the educational experience program treat students in teaching, and how to manage a good class. Different circumstances out class, students have experience interaction with students the educational experience program, and when it interact most exciting so impressed social competence better.

When viewed every the indicators, there are seven indicator category in a very good namely: (1) conversation skills in teaching, (2) skill approaching students in teaching, (3) skill in conform in teaching, (4) conversation skills out teaching (in schools), (6) skill cooperate with the school, and (7) skill in conform out class . Meanwhile, the competency students in social the educational experience program in SMKN 3 Yogyakarta in the category three indicators are includes: (1) skill empathy in teaching, (2) skill manage dissent in teaching, and (3) skill organize out class in school. This research result indicates that college students are in teaching there are still many deficient in empathize to their students, how “ teachers“ (the educational experience program) make their students feel cared for is weak , how “teachers“ able to solve problems or mediate opinion students different good different among students and different from “teacher“ still it has not. This can be understood because “teachers“ in teaching are still working so “teachers“ there are still many think of the materials given, while problems which are empathy and mediate problems have not yet been widely thought of by “teachers“ including courage in arbitrating on differences because there is fear favoring one of the parties.

This also a skill organize outside of school in schools according to students it has not, this may be caused deficiency “teachers“ in coordinate students activity in the out a class are not used because it in nature new to “teachers“. Overall this research result

indicates that social competency of students the educational experience program Faculty of Engineering, Yogyakarta State University in SMKN 3 Yogyakarta in the category of good. Nevertheless, needs to be done improving because a teachers are be an example their students so competence social should be good. The social competency of students we should be teaching and trained systematically as planning competence other teachers.

IV. CONCLUSION

The results of this research and his discussion, can be summed up as follows (1) the social competency of student Faculty of Engineering, Yogyakarta State University that the educational experience program in SMKN 3 Yogyakarta as a whole in the category of pretty good with mean score 2.9 (the scale of 4) or 72,46 (the scale of 100), (2) the social competency of student Faculty of Engineering, Yogyakarta State University that the educational experience program in SMKN 3 Yogyakarta in teaching in the category is good with mean score 2,89 (the scale of 4) or 72,19 (the scale of 100), (3) the social competency student Faculty of Engineering, Yogyakarta State University that the educational experience program in SMKN 3 Yogyakarta in schools outside of the class in the category is good with mean score 2.9 (the scale of 4) or 72.43 (the scale of 100), and (4) there are the seven indicators of social competence student Faculty of Engineering, Yogyakarta State University that the educational experience program in SMKN 3 Yogyakarta in the category of very good is (a) conversation skills in teaching, (b) skill approaching students in teaching, (c) skill in conform of your class, (d) skill manage a difference of opinion of your class, (e) conversation skills outside of class, (f) skill approaching students out teaching, and outside class, and (g) skill cooperate with the school in school; (5) there is indicators social competency student Faculty of Engineering, Yogyakarta State University the educational experience program in SMKN 3 Yogyakarta in the category is good: (a) skill empathy in teaching, (b) skill manage a difference of opinion in teaching, and (c) skill in organize out class in schools.

REFERENCES

- Castorina, Antonio Jose & Gil Anton (1999, March). *The Social Knowledge Psychogenesis and Social Representation*. Journal Prospects. International Bureau Of Education. Vol XXIX. No 1.
- Ghazali Bagus Ani Putra. (2014). *Membangun peradaban bangsa dengan pendidikan berkarakter moral* Internet: <http://www.pendidikankarakter.com/wajah-sistem-pendidikan-di-indonesia/>
- Goh, S.C. (2009). *Introducing a Model of Interpersonal Teacher Behaviour. Teaching and Learning*. Vol. 15. No. 1. Hlm. 30-40. Internet: <http://repository.nie.edu.sg/jspui/bitstream/10497/442/1/TL-15-1-30.pdf>
- Ivancevich J.M., Matteson Michael T. (1999). *Organizational Behavior And Management, Fifth Edition, International Edition*. New York: Mc Graw-Hill.
- Lilis Trianingsih. (2014). *Hubungan Interpersonal Guru-Siswa dengan Prestasi Belajar Siswa Kelas XII Paket Keahlian Teknik Gambar Bangunan DI SMK Negeri 2 Yogyakarta*. Skripsi. Yogyakarta: FT UNY.
- Slamet PH. (2011). *Pendidikan karakter dalam prespektif teori dan praktek*. Yogyakarta: UNY Press.
- Suparman, A. Manap, M. Yamin. (2014). *Profil kompetensi sosial mahasiswa universitas negeri yogyakarta calon guru. Laporan Penelitian: LPPM UNY*.
- Suranto AW. (2011). *Komunikasi Interpersonal*. Yogyakarta: Graha Ilmu
- Suyanto. (2007). *Tantangan Profesional Guru di Era Global. Pidato Dies Natalis ke-43 Universitas Negeri Yogyakarta*.

CURRICULUM DEVELOPMENT OF VOCATIONAL EDUCATION FOR ELECTRICAL ENGINEERING REFERS TO THE NATIONAL QUALIFICATION FRAMEWORK FOR STANDARIZING STUDENT COMPETENCE'S

M. Khairudin, R. Asnawi, Herlambang S.P, Totok Heru TM, A. Candra, T. Sukisno

Electrical Engineering Dept, Faculty of Engineering, Universitas Negeri Yogyakarta
e-mail: moh_khairudin@uny.ac.id

ABSTRACT

This paper is designed to provide the technical steps with some of the background theory relating to curriculum development refers to Indonesian National Qualification Framework (INQF/KKNI), highlighting some of the main approaches and recent trends in electrical engineering studi program (EE SP) for the level of diploma-3 of faculty of engineering, Yogyakarta State University Negeri Yogyakarta (YSU/UNY). Vocational education is a challenge in the provision of professional labor. Implementation of vocational education is closely associated with the curriculum development. The curriculum development that lead to the standardisation of competence in accordance with the INQF/KKNI. INQF/KKNI has standardised for the competence of graduates that refers to the regional qualification framework. This paper presents the development steps and results of curriculum development in EE SP which includes the vision, mission, objectives, graduates profile, learning outcomes and competences for assembling courses refers to INQF/KKNI. EE SP is the level of Diploma-3 in accordance to INQF/KKNI level is at level of 5. Diploma-3 has been categorised in INQF/KKNI included in the group of vocational education with minimum credits should be taken are 110 credits.

Keywords: curriculum, development, vocational, qualification framework.

I. INTRODUCTION

Education is the future investments of a nation. Therefore, education is the main asset in the development of a nation. One of a major component in education namely the curriculum. The word curriculum was from the Latin word of currus, which means to run a race. It means that once a child starts to learn, a child begins to run the race. This race is comprehensive in nature because, in the course of the race, the child or the learner encounters a lot of experiences, which may be intellectual, social, moral, spiritual or physical (Grace Offarma, 2014). In other illustrations, Judy McKimm (2007) explained this implies that one of the functions of a curriculum is to provide a template or design which enables learning to take place. Curriculum usually define the learning that is expected to take place during a course or programme of study in terms of knowledge, skills and attitudes, they should specify the main teaching, learning and assessment methods and provide an indication of the learning resources required to support the effective delivery of the course (Judy McKimm, 2007).

These experiences are provided to produce the total man. The experiences may be formal and planned or informal and accidental or unplanned (Grace Offarma, 2014). In the course of the race, the child may also encounter some obstacles which somebody must surmount either through his/her efforts or by the assistance of someone else to enable him/her to attain the expectations of the society. The child is the main focus of the curriculum.

Curriculum development in Indonesia has experienced the changing with the number of eleven times that was preceded with the lesson plan with the year of 1947, Education plan for basic school with the year of 1964, Curriculum for Basic school with the year of 1968, Curriculum development for a pilot project schools with the year of 1973, Curriculum for Basic school with the year of 1975, Curriculum with the year of 1984, Curriculum with the year of 1994, Curriculum revision with the year of 1994 on the year of 1997, a pilot project for competence based curriculum (CBC/KBK) on the year of 2004, The curriculum of educational unit level (KTSP) with the year

of 2006 and the new one is the curriculum of 2013.

The curriculum development of highly dynamic that has been equipped with a variety of supporting system. One of them is the curriculum development in the year of 2004 that obtaining the competency-based curriculum as a basis to provide the National standard of Work Competence of Indonesia (SKKNI). This paper presents a curriculum development refers to INQF/KKNI competence based for EE SP Faculty of Engineering YSU/UNY. Based on the Indonesian Presidential Regulation no of 8 in the year of 2012 presented the level of education in Indonesia devided as seen at Table 1.

Table 1. Education Level refers to INQF/KKNI

Level KKNI	Academic	Vocational	Profession	Occupation
1	Basic School			Operator
2	Senior high school			
3		D1		
4		D2		Technician / Analys
5		D3		
6	S1	D4		Expert
7			Profession	
8	S2	D5	Specialist1	
9	S3	D6	Specialist2	

These essential services for improving the education and training system in a country should be referred for developing curriculum. Curriculum development could be considered for continuing program. Fig.1 presents the framework of curriculum development for vocational education to improve the nasional standards for student's competences.



Fig.1. Simple approach for developing curriculum of vocational education (Laird and Stevenson, 1993)

In the curriculum development for competency-based vocational education refers to INQF/KKNI accordance with government regulation no. of 31 with the year of 2006. Also supported with The Minister of Education Regulation no. 49 with the year of 2014 about National Standard of Higher Education (SNPT). The role of ministry of education for improving national human resources refers to INQF/KKNI such as with decided the kind of standard of education level namely academic, vocational and profession based.

John Hattie (2009) explained several components for improving the education system. The several components of education system consist of (1) student, (2) home of student, (3) school, (4) curriculum, (5) teacher, (6) approaches to teach. John Hattie presented that the greatest effects on student learning occur when the teachers become learners of their own teaching and when students become their own teachers. For specific teaching material, Aliangga et al (2016) developed teaching materials of basic electrical and electrical measurement, and to find out the feasibility of the teaching materials.

Related to the curriculum development, John Hattie (2009) explained (1) Developing a curriculum that aims for the best balance of surface and deep understanding, (2) Ensuring a focus on developing learning strategies to construct meaning, (3) Having strategies that are planned, deliberate and having explicit and active programs that teach specific skills and deeper understanding. A good curriculum needs strategies to balance and to create meaning for the students "why do we need to learn what we learn"?

Tyler's approach (1949) of curriculum development was simple, logical, and rational, but it fell out of favor as educators began to view learning experiences more holistically and assess outcomes that are not so easily measured. Furthermore, Judith Howard (2007) presented that notion of revisiting and reexamining fundamental ideas over time is what has become known as a spiral curriculum. It makes students return again and again to the basic concepts, building on them, making them more

complex, and understanding them more fully.

The National Standard of Higher Education, as stipulated in The Indonesian Minister of Research, Technology and Higher Education Regulation no. 44 in the year of 2015 clause of 1 explained that the curriculum is a set of plans and arrangements regarding learning outcomes of graduates, lesson materials, processes, and assessments used to guide the delivery of courses. The curriculum of higher education is a mandate that institutions should be regularly updated in accordance with the needs and the development of science and technology as outlined in the Learning Outcomes.

In order to the most activities in education, curriculum development is not carried out in isolation from other activities. It is part of an iterative planning, development, implementation and review cycle. Peyton and Peyton (1998) noted that the curricular development consist of several cycles namely needs assessment, design and implementation phases. After this, outcomes are reviewed and evaluated against the original needs assessment. Needs change with societal expectations. The emphasis on different aspects varies with the participants' and teachers' perceived needs. The dynamic curriculum requires change and resource management (Judy McKimm, 2007).

The process for curriculum development of EE SP Faculty of Engineering YSU/UNY refers to the Indonesian Presidential Regulation no of 8 in the year of 2012 about INQF/KKNI, The Indonesian Minister of Education Regulation no. of 73 in the year of 2013 about implementaion of INQF/KKNI with higher education chapter, and related to The Indonesian Minister of Research, Technology and Higher Education Regulation no. 44 in the year of 2015 about national standard of higher education.

This study presents the design of curriculum development of EE SP Faculty of Engineering YSU/UNY for the level of diploma-3 with refers to INQF/KKNI competence based. This study as a clinical guide for the committee of department or study program especially in the level of diploma-3 or in INQF/KKNI level included

with category in level of 5 for the field of vocational education.

II. METHOD

This study using the method that refers to Peyton and Peyton (1998). The curriculum development consists of several cycles namely needs assessment, design and implementation phases that can be seen at Fig.2 below.

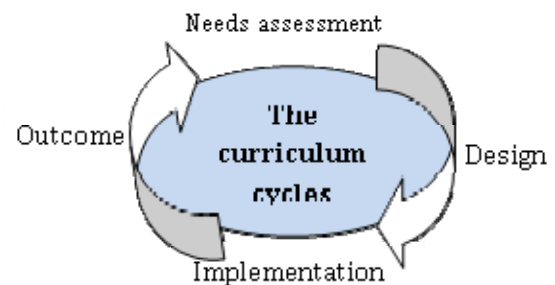


Fig.2. The Cycles of Curriulum Development

In developing a new programme, or modifying an existing one, there are a number of stages which must be completed within the curriculum cycles namely needs assessment, design and implementation phases and outcome with included feedback from the stakeholders.

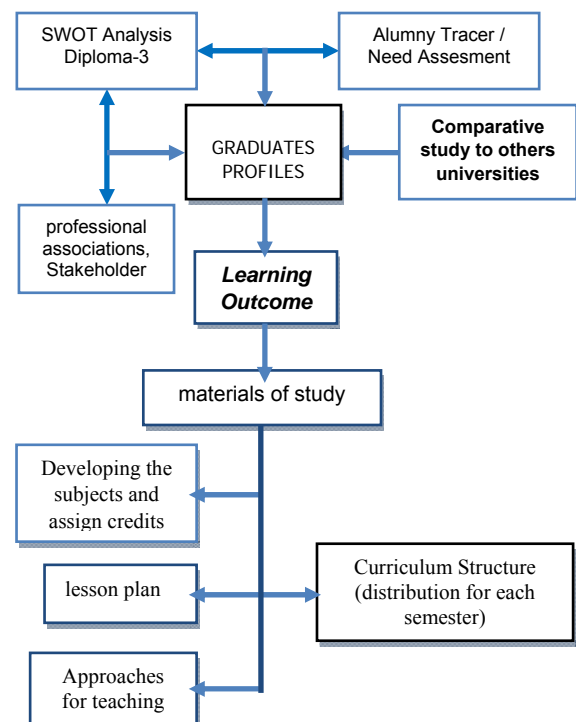


Fig.3. Steps for Developing Curriculum of Electrical Engineering Study Program

Generally, the steps for curriculum development of EE SP, Faculty of Engineering YSU/UNY with the level of diploma-3 can be seen in Fig.3.

III. RESULT AND DISCUSSION

The curriculum development of D3 Electrical Engineering study program in Faculty of Engineering, YSU/UNY is started with Strengths, Weaknesses, Opportunities and Threats (SWOT) analysis and market needs analysis through alumni tracer studies and also inputs from professionals, industries, stakeholders and community (student guardian) associations. For that sake, the D3 EE SP held a curriculum workshop involving all lecturers of D3 EE SP, alumni, industry and professional associations. The workshop was conducted twice on Saturday, September 24, 2012 and December 2, 2012. The invited parties are PT Schneider Indonesia, CV KHS and Professional Associations of PDKB GEMA. From this workshop, it is obtained inputs and considerations concerning to the user needs of graduates from the D3 Electrical Engineering Department. Besides, it is also supported with comparative studies to the other D3 Electrical Engineering study program (and other study programs) conducted by the team of curriculum developers, for instance a comparative study to the Polytechnic of Bandung, Bandung; Manufacturing Polytechnic and Academy of Industrial Mechanical Engineering in Solo, April 2014.

Furthermore, the results of the previous steps are then processed by the team of curriculum developers to develop visions, missions, goals, graduate profiles, learning outcomes, graduate competencies and course structures. The vision of D3 EE SP Faculty of Engineering YSU is that in 2025 it becomes superior and competitive to produce employees who are expert in the technical electrical power field equipped with pious, independent and competent characters and an ability to adapt the demands of the development of science and technology.

While the missions of D3 EE SP Faculty of Engineering YSU are (1) Carrying out high quality vocational education. (2) Preparing

excellent and competitive associate electrical engineering experts who suit the demands of the workforce competence. (3) Developing a system of vocational education in electrical engineering through research collaborations with stakeholders.

The goals of the D3 EE SP Faculty of Engineering YSU is to produce graduates who have employability skills as a professional labor of a associate expert in the technical field of electrical power, have innovative and adaptive quality competencies to the demands of the workforce and the development of science and technology, and are able to develop the entrepreneurial spirit and competitiveness at the local, national and global levels.

After determining the goals, the next step is to specify the overview of the graduate profiles. The graduate profiles are as follows: (1) Supervisor of electrical power, (2) Technician of electrical power, (3). Educational laboratory assistant, (4). Entrepreneurs/technopreneur, (5). Research assistant.

The Graduate profiles are functioned as the basis in determining the graduate learning outcomes. The preparation of the graduate learning outcomes refers to Ristekdikti Regulation 44/2015 on SNPT. The regulation states that the graduate learning outcomes consists of attitudes, knowledges, specific abilities, and general abilities.

The attitudes are composed of several values that should be performed by students (10). Having good characters, obey to the God Almighty and be able to express the religious attitude, honest and patient.(2) Upholding the human values in the line of duty based on religion, morals, and ethics. (3). Internalizing the values, norms, and academic ethics. (4). Playing a role as citizen who take pride and love with motherland (patriotism), nationalism and having a sense of responsibility to the state and nation. (5). Appreciating the diversity of cultures, views, religions and beliefs as well as the opinions and original findings from other persons. (6). Having contribution to improve the quality of life in society, nation, state, and the progress of civilization based on Pancasila. (7). Having a team work ability, social

sensitivity and concerning for the community and environment. (8). Obey the law, discipline in the life of society and state. (9). Having a spirit to be an independence, fight and entrepreneurship person. (10). Showing responsible for the jobs in the related field of expertise independently.

Otherways, the learning outcomes for graduates of EE SP in knowledges consist of (1). Knowledge of the basic principles of mathematics and its applications, especially in the field of Electrical Engineering. (2). Knowledge of the basic principles of physics related to the principles of electricity power. (3). Knowledge of the law and the basic theory of electricity. (4). Knowledge of the design and application of measurement systems associated with the Quantity and Quality of Power Engineering. (5). Knowledge of the power generation, distribution, utilization, installation and control of electric power in small or large scale industries in accordance with the general standards and principles in the field of electricity. (6). Knowledge of Electrical Power Engineering protection system to secure equipment and human safety. (7). Knowledge of Health and Safety in the world of industry in general, particularly in the electricity sector workforce. (8). Knowledge of the industrial management and entrepreneurship. (9). Knowledge of the preparation of the scientific paper (final project report) are in accordance with the scientific procedure based on analysis, information, data and is able to interpret and accurately communicate in order to solve problems and phenomena related to the electrical power field.

Furthermore the third learning outcomes is a specific abilities for graduates of electrical engineering Diploma-3 Faculty of Engineering UNY. The performances of specific abilities consist of (1). Identify and solve the problems in Power Engineering today and in the future by using the law and the basic theory of electricity within the framework of wider application. (2). Apply new technologies for design, analysis and application of measurement systems associated with the Quantity and Quality of Power Engineering to meet the needs of society professionally and ethically. (3).

Analyze the application materials related to the Electrical Power Engineering for developing the electricity energy development. (4). Understand the theory of electric power generation in general and energy efficiency in power plant. (5). Apply the standards that also applied in the electric power systems (PUIL, IEC, IEEE and other standards). (6). Understand and master the theory of transmission and distribution of electricity. (7). Apply the theory of measurement and measuring electrical parameters. (8). Apply the theory of electricity (single line diagram, wiring diagram, the laws of electricity and electrical circuits). (9). Master and apply the theory of electrical installations for commercial and industrial interests both single and three phase. (10). Master the concept of electric power quality and how to repair electric power profile. (11). Master the basics of electric energy control system (magnetic contactor, power electronics, PLC and microcontroller). (12). Master and applying the methods of maintenance and repair in Electrical Power System. (13). Apply Power Engineering protection system to secure equipment and safety of mankind. (14). Succeed preparing and writing a scientific article report in accordance with the scientific procedure based on analysis, information, data, also it is able to interpret and communicate accurately in order to solve problems and phenomena associated with the job.

In addition, the learning outcomes should be included general abilities. General abilities for graduates of electrical engineering diploma-3 of faculty engineering UNY consist of (1). Apply logical thinking, critical, systematic, and innovative in the context of the development or implementation of science and technology relevant to their expertise. (2). Analyse and solve common technical problems associated with electrical power engineering by applying the principles of Mathematics and Physics. (3). Examine the implications of the development or implementation of science, technology or arts in accordance with expertise based on rules, procedures and scientific ethics to produce solutions, ideas, design or art criticism and to develop

scientific description of the study results in the form of a thesis or final project report. (4). Take the appropriate decisions in the context of the settlement of the problem in the field of expertise, based on the result of information and data analysis. (5). Manage learning independently, develop and maintain network with mentors, colleagues, peers both inside and outside the institution. (6). Have basic skills in entrepreneurship, industrial management and communication /presentation in public.

In the curriculum referring to KKNI, it is listed the competencies that have to be mastered by students. There are three competencies to be determined by the study program, namely main competences, supporting competences and competences as the identities of Yogyakarta State University (YSU/ UNY). Thus, the further step is to determine the main competences, supporting competences and competences as the identities of Yogyakarta State University (YSU/ UNY). For the main competences of the graduates of EE SP Faculty of Engineering YSU can be seen at Table 2. below.

Table 2. Main Competence for Graduates of EE SP UNY

Graduate profiles	Main Competences
Supervisor of electrical power	<ul style="list-style-type: none"> • Identify the requirements of electrical systems • Install electrical systems • Test electrical equipment • Diagnose the problems of electrical systems • Maintain electrical systems • Repair electrical systems • Demonstrate ability to plan activities • Demonstrate ability to organise activities • Work effectively in team work
Technician of electrical power	<ul style="list-style-type: none"> • Identify the requirements of electrical systems • Install electrical systems • Test electrical systems • Diagnose the problems of electrical systems • Maintain electrical systems • Repair electrical systems • Manage a teamwork

Graduate profiles	Main Competences
Educational laboratory assistant	<ul style="list-style-type: none"> effectively and write reports • Demonstrate knowledge of alternative energy • Identify the needs of school laboratories • Install electrical systems at school laboratories • Test electrical systems at school laboratories • Diagnose the faults of laboratory equipment • Maintain laboratory equipment • Repair laboratory equipment • Manage laboratory inventory • Manage a teamwork effectively and write reports
Entrepreneur/ technopreneur	<ul style="list-style-type: none"> • Identify the requirements of electrical systems • Install electrical systems • Test electrical equipment • Diagnose the problems of electrical systems • Maintain electrical systems • Repair electrical systems • Demonstrate ability to plan activities • Demonstrate ability to organise activities • Work effectively in team work
Research assistant	<ul style="list-style-type: none"> • Identify the research needs • Implement research plans • Test electrical equipment • Diagnose the problems of electrical system • Maintain electrical system • Repair electrical System • Demonstrate ability to plan activities • Demonstrate ability to organise activities • Work effectively in team work

Otherwise, the supporting competences for graduates of EE SP Faculty of Engineering, YSU are presented at Tabel 3.

Table 3. The supporting Competences of graduates of EE SP

Graduate profiles	Main Competences
Supervisor of electrical power	<ul style="list-style-type: none"> • Apply OSH (occupational health and safety) management system • Utilize ICT to support the works in the field of electrical power • Demonstrate entrepreneurial spirit in the line of work • Demonstrate strong soft skills • Perform the ideal model for colleagues and subordinates
Technician of electrical power	<ul style="list-style-type: none"> • Apply OSH (occupational health and safety) management system in the field of electrical engineering • Utilize ICT to support the work the field of electrical power • Demonstrate entrepreneurial spirit in the line of work • Demonstrate strong soft skills
Educational laboratory assistant	<ul style="list-style-type: none"> • Apply OSH (occupational health and safety) management system in laboratories • Utilize ICT to support the work in laboratories • Demonstrate entrepreneurial spirit to develop laboratories • Demonstrate strong soft skills
Entrepreneur/technopreneur	<ul style="list-style-type: none"> • Apply OSH (occupational health and safety) management system • Utilize ICT to support the work the field of electrical engineering • Demonstrate entrepreneurial spirit • Demonstrate strong soft skills • Perform the ideal model for colleagues and subordinates

Graduate profiles	Main Competences
Research assistant	<ul style="list-style-type: none"> • Apply OSH (occupational health and safety) management system • Utilize ICT to support the work the field of electrical engineering • Demonstrate entrepreneurial spirit • Demonstrate strong soft skills • Perform the ideal model for colleagues and subordinates.

Furthermore, the third competences for graduates of EE SP Faculty of Engineering are the identities competence of YSU. The competences as identities of university can be seen at Tabel 4.

Table 4. The Competences as Identities of YSU graduates

Graduate profiles	Main Competences
Supervisor of electrical power	<ul style="list-style-type: none"> • Work independently or in teams • Actualize the religious values into work • Adapt to the conditions in the workplace while upholding the norms of religion and law
Technician of electrical power	<ul style="list-style-type: none"> • Work independently or in teams • Actualize the religious values into work • Adapt to the conditions in the workplace while upholding the norms of religion and law
Educational laboratory assistant	<ul style="list-style-type: none"> • Work independently or in teams • Actualize the religious values into work • Adapt to the conditions in the workplace while upholding the norms of religion and law
Entrepreneur/technopreneur	<ul style="list-style-type: none"> • Work independently or in teams • Actualize the religious values into work • Adapt to the conditions in the workplace while

Graduate profiles	Main Competences
	upholding the norms of religion and law
Research assistant	<ul style="list-style-type: none"> • Work independently or in teams • Actualize the religious values into work • Adapt to the conditions in the workplace while upholding the norms of religion and law

This study organizes and develops the course structure through the initial step by analysing the proportion of the materials presentation in accordance with the breadth and the depth of the competencies. Table 5 provides the groups of competences that will emerge the course structure.

Table 5. Designing Subject Based on the Deepness and Spaciousness of Competencies

No	Competences	Credits Ratio	Percentages
1	Electricity generation	3	3%
2	Electric power distribution	4	4%
3	Electrical Installation	12	11%
4	Management of Electrical Energy	6	6%
5	Electrical Power Control	13	12%
6	Protection of Electrical Power	2	2%
7	Electrical basic science	10	10%
8	Electronic basic sciences	8	7%
9	Department courses (common ground Jur/PRODI)	26	23%
10	Faculty courses (KTF)	9	8%
11	University courses (MKU)	17	16%
Total		110	100%

Table 5 reveals that the main competences in electrical engineering accounts for 76 percentages of the overall

percentage, while the supporting and identities competence totally accounts for only 24 percentages. It indicates the main competences becomes the primary target to assist the students achieve the ideal competencies.

IV. CONCLUSION

This study develops the curriculum of EE SP, Faculty of Engineering, YSU/UNY. The development refers to INQF/KKNI based on competencies. The results of the curriculum development are the technical stages of the development. The final results consists of visions, missions, goals, graduates profiles, learning outcomes and the course structure in the form of groups of competencies.

REFERENCES

- Aliangga Kusumam, Mukhidin Mukhidin, Bachtiar Hasan. (2016). *Pengembangan Bahan Ajar Mata Pelajaran Dasar dan Pengukuran Listrik untuk Sekolah Menengah Kejuruan*. Jurnal Pendidikan Teknologi dan Kejuruan. Vol 23, No 1 (2016).
- David Laird and John Stevenson, (1995), *A Curriculum Development Framework for Vocational Education*, Australian and New Zealand Journal of Vocational Education Research. pp 71-92.
- Judith Howard. (2007). *Curriculum Development. Summer Material*. Elon University
- Judy McKimm. (2007). *Curriculum design and development. Teaching Material in Centre for Educational Development*, School of Medicine Imperial College.
- Indonesian Presidential Regulation no of 8 in the year of 2012 about *Indonesian National Qualification Framework (INQF/KKNI)*.
- The Indonesian Minister of Education Regulation no. of 73 in the year of 2013 *about implementaion of INQF/KKNI with higher education chapter*.
- The Indonesian Minister of Research, Technology and Higher Education Regulation no. 44 in the year of 2015

about *national standard of higher education*.

Tyler, R. W. (1949) *Basic principles of curriculum and instruction*. Chicago: University of Chicago Press.

John Hattie. (2009). *Visible Learning For Teachers*. Routledge.

EXPLORING THE MALAYSIAN QLASSIC PRACTICALITY

Sohimi, N. E, Affandi, H.M, Fadzil, H., Mohd Sattar, R.

Faculty of Education, National University of Malaysia

Faculty of Architecture Planning and Surveying, Universiti Teknologi Mara

nezzaty89@gmail.com, haryantima@ukm.edu.my, padzil037@salam.uitm.edu.my, sattar@ukm.edu.my

ABSTRACT

A quality assessment system is an essential precondition for contracting firms wishing to achieve their quality goals, survive and compete in the current changing and competitive market in the construction industry. Thus, the Quality Assessment System in Construction or better known as QLASSIC was introduced to achieve success criteria on delivering a good quality product by Malaysian construction industry. The purpose of this paper is to identify the practicality of QLASSIC assessment process in Malaysia from the view of QLASSIC practitioner. Survey design has been adopted to this research which implemented the questionnaire survey as an instrument. A 69 QLASSIC practitioners involved in this study, consist of parties that practice and implement the QLASSIC assessment in their project. From the analysis, it identified that QLASSIC assessment giving high benefit to the QLASSIC practitioners especially contractor and client. This finding also discovered that most important barrier factors to implement the QLASSIC assessment is difficulty in getting the right skilled and competence sub-contractors/tradesmen to carry out the works. Moreover, this research indicates that training is one of the important factors to improve the site management team competency in assessing the project and ensure the project can achieve good QLASSIC rating. Based on the result in this study, the future study will be conducted to identify the training and competency of site management team issues in QLASSIC assessment.

Keywords: QLASSIC, building quality, assessment, construction

I. INTRODUCTION

Building quality has become one a very important aspect for construction project success. In the building construction, failures and defects are common. This problem may reduce the quality of a landed housing, strata-titled housing, or public building. Building defects can be resulted from the design error by the architect, a manufacturing flaw, defective materials, improper use or installation of materials, lack of adherence to the design by the contractor, or any combination of them (Ahzahar, 2011). There are 9 elements affecting the quality of building construction project which are, design, contract, material, labor, equipment, subcontractors, site layout, systems, site staff, and execution (Abdul-Razeq, 2001).

Moreover, standard reduction, unskilled worker, and less qualified construction technologist contribute to the building quality problem (Memon, 2010). Also, the other factors impede the construction quality of buildings are lack of understanding of end-user requirements, poor contract documentation and low

consultant fees, incompetent standard of workmanship, lack of focus on quality and inadequate supervision and inspection (Love and Edwards, 2004). In addressing the issues in Malaysia building quality, Construction Industry Board of Malaysia (CIDB) introduced a Quality Assessment System in Construction (QLASSIC) as an independent method to assess and evaluate the quality of workmanship of a construction work based on approved standard (CIDB, 2006). Hence, the introduction of QLASSIC is expected to address several of the predominant quality issues that prevailed in the construction realm (Mukhtar, 2010).

Assessing Building Quality in Malaysian Construction Industry

Quality is an important aspect in the construction industry. The quality issues are the main concern for all parties especially to the developers in order to fulfill the building quality requirement expected by property purchasers (Abdullah et al., 2013). Hence, assessing the quality of construction for compliance with the design

intent has been a challenging task in the AEC (Architecture, Engineering, and Construction) industry (Sri Kalyan et al., 2016).

The demand for skilled and competence site management team is pre-prominent because workmanship is one of the essential factors for good quality in building construction work. Moreover, technical work competency and knowledge is the important aspects for foreman on construction site (Uwakweh, 2005). The incompetent supervisors and lack of skills among the workers is one of the factors affecting quality in building construction (Alinaitwe et al., 2007). Also, the most important factor inhibiting the successful completion of a construction project is the scarcity of skilled personnel at all levels especially supervisors (Ogunlana et al., 2002).

QLASSIC assessment on a construction project shall be carried out by competent assessors appointed by CIDB. However, result from previous research identified 2 several areas which need further improvement which are, CIDB's supervision during assessments by the appointed external assessors and the competency of the assessors (Mukhtar et al., 2014). In assessing the building quality, contractor supervisory staff must possess the skills, knowledge, expertise, and capabilities to administer the construction work (Maloney, 2002).

II. METHODOLOGY

This study adopted a survey research design. The instrument that involved is a set of QLASSIC assessment questionnaire. The questionnaire of QLASSIC assessment contained the following parts:

- A. Demographic
- B. Effectiveness of QLASSIC Assessment Process:
 1. Appropriateness of the QLASSIC assessment process
 2. Appropriateness of the project elements assessed
 3. Competency of assessor in undertaking the assessment
 4. Benefit targeted from the QLASSIC assessment

5. Factors that a barrier to QLASSIC assessment
6. Suggestion for improving the QLASSIC assessment process

The questionnaire was distribute to correspondences in the construction industry. The totals are 69 responses from the QLASSIC practitioner which comprised of 17 clients, 29 contractors, and 23 QLASSIC assessors. The data from this research was analyzed using descriptive analysis. The demographic part is analyzed using percentage, and the effectiveness of QLASSIC assessment is analyzed using mean value.

III. RESULT AND DISCUSSION

3.1. The Participants Profile

Part A presented the respondent's demographic profile. The result in Table 1 determined that the majority of respondents in this study is a contractor, 29 individuals (42.03%). Most of the respondents' project that assessed using QLASSIC is landed housing project because the percentage is 39.63, higher than other project. There are 2 highest project values that assessed using QLASSIC which are the project between RM 10 million until RM 30 million and project exceed RM 100 million by the contractor grade 7.

Table 1 Analysis Demographic Respondent

Demographic	Percentage (%)
Your association/role in the QLASSIC assessment	
Client	24.64
Contractor	42.03
QLASSIC Assessor	33.33
Type of project assessed by QLASSIC	
Landed housing	39.63
Strata-titled housing	32.32
Public building	20.12
Hospital/airport	7.93
Project Value	
Below RM10 million	23.44
Between RM10-30 million	28.13
Between RM30-50 million	20.31
Exceeding RM 100 million	28.13

Table 2 presented that the majority of the respondent project is located around Selangor and Kuala Lumpur area.

Table 2 Project Location

Project Location	Percentage (%)
Selangor/Kuala Lumpur	54.43
Perak	6.33
Kedah	3.80
Kelantan	13.92
Terengganu	1.27
Johor	8.86
Negeri Sembilan	1.27
Sarawak	6.33
Pulau Pinang	1.27
Pahang	2.53

Table 3 shows, the number of the project audited by QLASSIC among Malaysian contractor increased from 2007 until 2015.

Table 3. Project audited using QLASSIC among Malaysian contractor (2007-2015)

No. of project / Year	1 project	2 project	3 project	More than 4 project
2007	1.45 %	0.48 %	-	-
2008	1.93 %	0.48 %	1.93 %	0.48 %
2009	2.90 %	0.97 %	1.45 %	1.93 %
2010	4.35 %	1.45 %	1.45 %	1.93 %
2011	3.38 %	1.45 %	1.45 %	1.93 %
2012	6.76 %	3.38 %	0.97 %	2.90 %
2013	7.25 %	2.90 %	1.93 %	3.38 %
2014	4.83 %	5.31 %	3.87 %	3.87 %
2015	6.76 %	5.80 %	1.93 %	4.35 %

From the results, the percentage value of contractor firms which have 2 and more than 4 project that have been audited by QLASSIC increased from 2007 until 2015. Meanwhile, the percentage value of contractor firms which have 1 and 3 project that have been audited are fluctuated.

3.2. Appropriateness or suitability of the QLASSIC application and assessment process.

The result in Table 4 shows the appropriateness or suitability of the QLASSIC application and assessment process.

Table 4. Appropriateness of the QLASSIC assessment process

Suitability of the following QLASSIC application and assessment process	Mean	Description
1. Application method and the processing time	3.7258	Appropriate
2. Selection of sample and location	3.9524	Appropriate
3. Assessment at the project site	4.0167	Appropriate
4. Fairness of the assessment marking scheme	3.9355	Appropriate
5. Time taken to undertake the assessment	3.6935	Appropriate
6. Time taken to get the assessment result	3.0484	Moderately Appropriate

From the results, it found that the entire respondents agreed that most of the application and assessment process in QLASSIC is appropriate. However, it indicated that all the respondent agreed time taken to get assessment result is moderately appropriate.

3.3. Appropriateness of the project elements assessed

Table 5 shows; there are 3 types of works that assessed in a QLASSIC which are architectural works, mechanical and electrical works, and external works. The results discovered that all the assessment in QLASSIC for each type of work is appropriate. The mean value of the items is around 3.6842 until 4.344.

From this finding, the suitability of the scope/element in internal finishes assessment is very appropriate with the QLASSIC assessment. Internal finishes cover the major part in the building included floors, internal walls, ceiling, doors, windows and fixtures (internal). Because of that, the weightage (%) of the internal finished in QLASSIC assessment is high which is 56% (CIDB, 2006).

Based on the CIS: 7 (2006), the location of internal finishes assessment was categorized into 3 types, which are

principal locations are major functional places such as halls and rooms, circulation locations include lift lobbies, corridors and

staircases and service locations are utility areas such as toilets, kitchens, balconies, and yards.

Table 5 Appropriateness of the project elements assessed

Appropriateness of the project elements assessed		Mean	Description
Suitability of the Architectural Works assessed:			
1.	Suitability of the sample chosen to be assessed	3.8571	Appropriate
2.	Suitability of the number of sample assessed	3.8852	Appropriate
3.	Suitability of the scope/elements of the following Architectural Works assessed		
a.	Internal Finishes	4.3443	Very Appropriate
b.	Roof	3.8814	Appropriate
c.	External Wall	4.1207	Appropriate
d.	Apron & Perimeter Drain	3.8644	Appropriate
e.	Material & Functionality test	3.8475	Appropriate
Suitability of the Mechanical & Electrical Works assessed:			
1.	Suitability of the sample chosen to be assessed	3.9298	Appropriate
2.	Suitability of the number of sample assessed	3.8596	Appropriate
3.	Suitability of the Mechanical & Electrical (M&E) elements assessed	3.7857	Appropriate
Suitability of the External Works assessed:			
1.	Suitability of the sample chosen to be assessed	3.8772	Appropriate
2.	Suitability of the number of sample assessed	3.8103	Appropriate
3.	Suitability of the Mechanical & Electrical (M&E) elements assessed		
a.	Link-way/ Shelter	3.6842	Appropriate
b.	External Drain	3.6842	Appropriate
c.	Roadwork and Car Park	3.7069	Appropriate
d.	Footpath and Turfing	3.7018	Appropriate
e.	Playground	3.7719	Appropriate
f.	Court/Sports facilities	3.8246	Appropriate
g.	Fence and gate	3.8070	Appropriate
h.	Swimming pool	3.8246	Appropriate
i.	Electrical Substation	3.8621	Appropriate

3.4. Competency of assessor in undertaking the assessment

The results in Table 6 shows, that the level of assessor competency in assessing architectural work, mechanical & electrical works and external works is high.

Table 6 Competency of assessor in undertaking the assessment

Competency of assessor in undertaking the assessment	Mean	Description
1. Level of competency of Assessor in assessing Architectural Work	4.016	High
2. Level of competency of Assessor in assessing Mechanical & Electrical Works	4.000	High
3. Level of competency of Assessor in assessing External Works	4.180	High

IV. Benefit targeted from the QLASSIC assessment

The result in Table 7 found that all the respondents have a positive expectation that QLASSIC assessment will give high benefit for the Malaysian construction industry because building quality can be measured by the customer satisfaction. The importance of quality has expended to concentrate on the clients or customers' satisfaction (Adnan et al., 2000) and QLASSIC assessment can help to increase the clients/customer satisfaction. The implementation of QLASSIC assessment also can help to build the reputation of the contracting firm and build the project management personnel capacity in managing projects in the future. Moreover, the QLASSIC rating score ca help companies to obtain for the sole purpose of being

accepted by some specific tender (Suzuki, 2004). Furthermore, the QLASSIC assessment can be regarded as an effort of a company to improve its total quality management by addressing issues such as cost efficiency, company productivity, company efficiency and customer satisfaction which directly enhance the related company as whole (Hwang et al., 2013).

Table 7. Benefit targeted from the QLASSIC assessment

	Benefit targeted from the QLASSIC assessment	Mean	Description
1	Customer/user satisfaction	4.016	High
2	Building the project management personnel capacity in managing projects in future	4.000	High
3	Building the reputation of the company as a good contractor	4.180	High

3.5. Factors that be a barrier to QLASSIC assessment

Table 8 was illustrated the result to examine the QLASSIC practitioner response toward the factors that be a barrier to QLASSIC assessment. The result found that there are 4 important barrier factors to the QLASSIC assessment. First, difficulty in getting the right skilled sub-contractors/tradesmen to carry out the works. Most of the available skill workers are still lack of appropriate technical skills and knowledge (Pan et al., 2007). Moreover, Hoonakker et al. (2010) study found that skilled workforce is an important aspects for improving quality. Secondly, contractors are lack of competent quality supervisors in controlling the project quality. The supervision of the contractor is one of the factors that affect quality in construction phase (Arditi et al., 1998). Also, the contractor skills and experience is the highest factors among the sub-factors that influenced quality. (Rifat and Amer, 2001)

This finding also showed that absence/weakness of an effective quality management system within the project is one of the important barrier factors to the

QLASSIC assessment. The study from the other researcher stated that the causes of the decline of construction productivity directly or indirectly involved poor management practices Business Roundtable (1983). Another important barrier factor to QLASSIC assessment is the architects do not possess adequate competency to manage the quality of work at the project site. Architect is expected to visit the site from time to time to familiarize himself with the progress and quality of the work being performed by the construction team (Sapers, 2009). Therefore, a professional consultant is more knowledgeable about construction quality than the developers because they determine the construction specifications (Adi et al., 2014).

Table 8. Factors that be a barrier to QLASSIC assessment

	Factors that be a barrier to QLASSIC assessment	Mean	Description
1.	The high cost of QLASSIC audit	2.833	Moderately Important
2.	Managing projects to achieve quality such as QLASSIC is not the company policy	3.217	Moderately Important
3.	Difficulty in getting the right skilled sub-contractors/tradesmen to carry out the works	3.767	Important
4.	Absence/weakness of effective quality management system within the project	3.650	Important
5.	Contractors lack competent quality supervisors to control the project quality	3.729	Important
6.	The following consultant teams do not possess adequate competency to manage the quality of work at the project site		
	a. Architects	3.610	Important
	b. Civil & Structural Engineers	3.066	Moderately Important
	c. Mechanical & Electrical Engineers	3.100	Moderately Important
7.	Lack of training to implement quality management according to QLASSIC standards	3.116	Moderately Important

3.6. Suggestions for improving the QLASSIC assessment process

The result in Table 9 shows the QLASSIC training is very important to ensure that the project can achieve a good QLASSIC rating. It is suggested for the sub-contractors, consultants and Superintending Officer (S.O) participate in the QLASSIC training because it can give a positive impact to their performance in quality assessment. Education and training are the most important elements affecting the quality and a quality ongoing training program has an important quality strategy (Jraisat et al. (2006); Sharmma and Gudanne, (2002)). Furthermore, employee training is one of the factors that affect quality in construction phase (Arditi et al., 1998). QLASSIC training is one of the opportunity for the construction practitioner to expand the knowledge and skill in quality assessment. Also, skills of workers can be demonstrated once the training complete Ling et al., 2007).

Table 9. Suggestions for improving the QLASSIC assessment process

Suggestions for improving the QLASSIC assessment process	Mean	Description
1 Importance for consultants and Superintending Officer (S.O) to also follow the QLASSIC training to ensure that the project can achieve good QLASSIC rating	4.2712	Very Important
2 Importance for sub-contractors to also follow the QLASSIC training to ensure that the project can achieve good QLASSIC rating	4.4833	Very Important
3 Importance for the project management team to have an in-house QLASSIC officer so that the project can achieve a good QLASSIC rating	4.3333	Very Important

V. CONCLUSION

Quality assessment has been adopted in the construction industry as one of the methods to solve the quality problem and improve the quality of the construction project. The CIDB introduced the QLASSIC

assessment as one of the methods to assessing the building construction project. All the QLASSIC practitioners and participants in this study agreed that the QLASSIC assessment giving a high benefit for their future project and all the elements in QLASSIC assessment is appropriate to be implemented in the assessment process. However, there are 4 important barrier factors in implementing the QLASSIC assessment need to be highlighted. Therefore, the competence and knowledgeable workers in the construction industry is important to improve the project quality. Meanwhile, training is one of the important factors to improve the site management team competency in assessing the project and ensure the project can achieve good QLASSIC rating. Based on the result in this study, the future study will be conducted to identify the training and competency of site management team issues in QLASSIC assessment.

REFERENCES

- Abdel-Razeq, R. H. (1998). Factors Affecting Construction Quality in Egypt: Identification and Relative Importance. *Journal of Construction and Architectural Management*, (3), 220-227.
- Abdel-Razeq, R. H., El-Dosouky, A. I., and Solaiman, A. M. (2001). A Proposed Method to Measure Quality of Construction Project. *International Exhibition Conference for Building & Construction*, Egypt.
- Abdul-Rahman, H. (1995). The Cost of Non-Conformance During A Highway Project. *Construction Management and Economics*, 13 (1), 23-32.
- Adi Irfan, C. A., Tawil, N. M., Johar, S., Abd Razak, M. Z., and Yahya, H. (2014). Building Condition Assessment for New Houses: A Case Study in Terrace Houses. *Jurnal Teknologi*, 70(1), 43-50.
- Adnan, H., Shariff, N., and Awaluddin, M.S. (2000). Issues in Quality Engineering Research. *Internal Journal of Quality and Reliability Management*, 17(8), 858-875.
- Albert Chan, P. C., and Daneil Chan, W. M. (2003). *A Quest for Quality*

- Improvement in Hong Kong.* 10th Symposium Construction Innovation and Global Competitiveness, CRG Press. 1200-1213.
- Alinaitwe, H. M., Mwakali, J. A., and Hansson, B. (2007). Factors Affecting The Productivity Of Building Craftsmen-Studies of Uganda. *Journal Civil Engineering Management*, 13(3), 169–176.
- Arditi, D., Gunaydin, H. M, et al. (1998). Factors That Affect Process Quality In The Life Cycle of Building Projects. *Journal of Construction Engineering and Management*, 124(3), 194-203.
- CIDB. (2006). *Construction Industry Standard: CIS 7: Quality Assessment System for Building Construction Work*, Construction Industry Development Board Malaysia, Kuala Lumpur, Malaysia.
- Construction Industry Institute (CII). (1989). *The quality performance management system: a blueprint for implementation*. Publication 10-3, Construction Industry Institute, Austin, TX.
- Culp, G., Smith, A., and Abbott, J. (1993). Implementation of TQM in Consulting Engineering Firm. *Journal Construction Engineering and Management*, 9 (4), 340-366.
- Hassan, A. (2009). *Contextual Issues of the Built Environment in Malaysia*. Pulau Pinang: Universiti Sains Malaysia.
- Hoonakker, P., Carayon, P., and Loushine, T. (2010). Barriers and Benefits of Quality Management in The Construction Industry: An Empirical Study. *Total Quality Management*. 21(9), 953-969.
- Hwang, B. G., Tan, H. F., and Sathish, S. (2013). Capital Project Performance Measurement and Benchmarking in Singapore. *Engineering, Construction, Architectural Management*, 20 (2), 143- 159.
- Ibrahim, A. R., Roy, M. H., Ahmed, Z. & Imtiaz, G. (2010). An Investigation of the Status of the Malaysian Construction Industry. *Benchmarking. An International Journal*, 17(2), 294-308.
- Ling, F. Y.Y. & Bui, T. T. D. (2010). Factors affecting Construction Project Outcome: case study of Vietnam. *Journal of Profesional Issues in Engineering Education and Practice*, 136 (3), 78-90.
- Love P., Edwards D. (2004). Forensic Project Management: The Underlying Causes Of Rework In Construction Projects. *Journal of Civil Engineering and Environmental Systems*, 21(3):207-228.
- Maloney, W. F. (2002). Construction Product/Service And Customer Satisfaction. *Journal of Construction Engineering and Management*, 128(6), 522-529.
- Memon, A. H., et al. (2010). Factors affecting Construction cost in MARA Large Construction Project: Perspective of Project Management Consultant. *International Journal of Sustainable Construction Engineering and Technology*, 1(2), 41-54.
- Mukhtar, C. A. (2010). Understanding the Underlying Principles of QLASSIC Assessment. *Bulletin The Ingenieur*, 45 (March-May), 51-54.
- Oberlender, G. D. (1993). *Project Management for Engineering And Construction*. McGraw-Hill, Inc., New York.
- Ogunlana S, Siddiqui Z, Yisa S, Olomolaiye P. (2002). Factors And Procedures Used In Matching Project Managers To Construction projects In Bangkok. *International Journal of Project Management*, 20 (5), 385–400.
- Pan, W., Gibb, A.G.F., and Dainty, A.R.J. (2007) Perspectives Of UK Housebuilders On The Use Of Offsite Modern Methods Of Construction. *Journal Construction Management and Economics*, 25(2), 183- 194.
- Rifat N. R., and Amer, M. I. (2001). *Identification Of The Factors Affecting Quality In Building*

- Construction Projects In GAZASrip.*
unpublished.
- Sapers, C. (2009). The Architect's Role in the Construction Phase. unpublished.
- Sharmma, B. and Gudanne, D. (2002), "An inter industry study of quality practices and performance", *Magazine of Managing Service Quality*, 12 (6), 394-404.
- Sodangi, M., Idrus, A. &Khamidi, M. F. (2010). *Measuring Quality Performance in Construction*.International Conference on Sustainable Building and Infrastructure (ICSBI 2010).
- Sri Kalyana, T., Puyan A. Z., Sheryl, S., and Thomas, M. F. (2016). Construction Quality Assessment using 3D as-built Models Generated with Project Tango. *Procedia Engineering, International Conference on Sustainable Design, Engineering and Construction*, 145(2016), 1416-1423.
- Uwakweh, B. O. (2005). Effect Of Foremen On Construction Apprentice. *Journal Construction Engineering Management*, 131(12), 1320-1327.

VOCATIONAL SCHOOL QUALITY IMPROVEMENT BY STRATEGIC PARTNERSHIP WITH INDUSTRIAL SIDE

Zainal Arifin

Automotive Department, Engineering Faculty, Yogyakarta State University
email: za.otomotif@gmail.com

ABSTRACT

The aim of this study is to reveal a variety of phenomenon in school and industry, in order to evaluate the implementation and the effectiveness of collaboration partnership between school and industrial side (stakeholder) which has been applied as well as the possible benefit for both parties. Research approach used in this study is qualitative research based on constructionism with multiple realities assumption which is built socially through individual and collective perception when observing the same situation. Collecting the data is done by observation, interview, inquiry, and documentation. Data validity can be proved through triangulation technique to get the valid data with data source triangulation and triangulation method. Based upon the result of this research, it is gained the empirical data in reference to some things related to the collaboration partnership between vocational school and industry world. This research finding shows that the collaboration partnership is an important thing highly needed to be well-developed by both parties to reach their goal.

Keywords: vocational school, quality improvement, strategic partnership

I. INTRODUCTION

Educational Quality is the main focus in developing the education development policy as only by high quality education that will produce high quality graduates who are able to develop themselves, family, society, nation and country. The quality of education service is the last product of interaction and interdependence feeling between the variety of component, that are learning service and education administration service belong to the integral part of education service system in schools.

Vocational school is a strategic program to serve middle level of employees who own supporting provision for mastering skill profession and provision abilities of self-development to follow the knowledge and technology development in particular field.

The quality of education in Vocational School can be measured by the quality and relevance of its graduate with the demand in real life. While at the same time, the demand in a particular field always grows accord with productivity and technology development necessity, so as the consequence to keep the application of its education quality, vocational school must be ready to develop itself continually.

Based on the data of each vocational

school, the executor of Lightweight Vehicle Engineering Program in Yogyakarta in 2015 shows some nodal problem in managing education and quality of vocational school graduates in Yogyakarta particularly in term of absorption of graduates towards industry world.

From ten vocational schools in Yogyakarta which can be divided into two state vocational schools, while the eight other are private schools, with approximately accredited A, with the level of growing amount of student reach up to 0,13% per year. According to data on Department Education in Yogyakarta, it is obtained information that the level of students' achievement who repeat in vocational school every year is 1.04%, with an average of dropouts reached 0.75%. While the achievement of National Exam graduation reaches 80.11% with the average of National Final Exam score is 6.42.

While the absorption of graduates to the industry reaches 72.7% on average for the state vocational school and 40.82% for the private vocational school, with the average length of job search since graduating from vocational school is more than six (6) months. Besides, there are graduates who have not gotten job as much as 21.96%, and only 4.72% of vocational graduates who

continue their study to the higher education level. However, data from private vocational school show that averagely 18.85% of each class of vocational graduates turn to be an entrepreneur.

Up to this present time, national data shows that absorption of vocational school graduate in industry world is still low enough. According to The Indonesian Central Bureau of Statistics, data in 2008 mentions that although the rate of job vacancy still far lower than the rate of job seeker. In fact, not all the job vacancies are full of its placement. In 2007, there are 375,160 job seekers available, and 300,400 job vacancy available, as well as 175,540 workers are placed. The condition shows that it has been happened mismatch in job market (Central Bureau of Statistics, 2009: 62). While in Yogyakarta, there are 38,490 of employee listed (job seeker), but the available job vacancy listed only 22,208. From the number of which, there are only 17,106 of employment placement. In addition, based on Department of Manpower and Transmigration data as well as Department of Industry, Trade and Cooperatives of DIY in 2008, the average of waiting graduation since graduated from Senior High School (Vocational School-Senior High School) for hiring a job is around 0-2 year as many 15.220 people, 3-5 year 7.628 people, and >5 year 8.505 people (Kompas, 6 March 2010).

Based on those data can be figured rate of the educated unemployment amount particularly on senior high school or vocational school graduates and the rate of waiting time of the job seeker to get job, which shows that the relevance of education implemented well in vocational school as well as senior high school has not able yet to fulfill the available demand and job competence available. In addition, based on Central Bureau of Statistics data, it can be seen that almost 20% of job vacancies are ignored, while the half of which are labor forces who are graduated from college and diploma.

In the other side, unemployment rate on intermediate-educated labor force still shows an upward trend, as a visible image in 2007-2008, it increases from 3.6 millions become 3.9 million or it is around $\pm 7\%$, in diploma education from 237.251 people

become 322.836 people or it increases up to 36%. Besides that, for college education from 348.107 become 385.418 or it increases up to 11% (managed from Central Bureau of Statistics data in 2008). This growing amount indicates that there is an imbalance, so its completion is extremely essential and should be followed up immediately.

Furthermore, it is explicitly reported in the Labor and Social Trends Reports in Indonesia 2008, the International Labor Organization (ILO) says that as many as 4.5161 million people from 9.4276 million who are unemployed are high school and vocational school graduates (Kompas, August 22, 2008). Based on data from the Central Statistics Agency in Table 1 shows that the number of unemployment graduated from senior high school especially vocational school are indeed prepared to work immediately, due to low-absorption of a vocational school graduate to qualify the labor market then their focus competence and expertise are being the most expected thing.

Vocational education is considered as one of education level in intermediate level of two line education system implemented in Indonesia (Slamet, 1996). There are some definitions of vocational education, (1) According to Evans and Herr (1978), vocational education is a part of education to create a more qualified individual in certain work community; (2) Home Committee on Education and Labor, (Oemar, 1990: 24) argue that it is a form of developing talent, skilled basic education and habitual action leading to work life thought as skill training. On the other hand, however, Suharsimi (1988: 5) defines vocational education as a certain or special education planned to prepare its students to enter a certain work world or occupation in family or to upward the quality of employees; (4) Brown (1979: 16) tends to believe that vocational engineering education program is " ...prepared to take part in the world of work, either permanently or during a period of further education be able to earn a living is invaluable to anyone, and the nation's work force can be greatly improved by the addition of skilled teenagers".

From some definitions above, it is clear that vocational education job orientates on

the job that makes its program aims to prepare for working, not only for the sake of skills learning to the individual in order to have a proper life which is relevance with society's needs, but also to give them skills about working effectively and efficiently as well to prepare competences that are necessary for every students after finishing the education. Thus, the existence of vocational education seeks to improve job skills as much as possible so as to provide opportunity for the graduates to ready to enter the work world. It is as mentioned by Calhoun and Finch (1982: 64), "...The Principle have not changed even though the implementation has brought new approach, there is vocational education provides the skills and knowledge valuable in the labor market". Furthermore, Clarke and Winch (2007:9) deliver that the function of vocational education is to prepare the youth and the mature people to work.

The success of vocational education in organizing its education program cannot be measured by the amount of graduated students or performance student only, but also by the amount of vocational school graduate are hired.

For vocational education institutions, following the development of science and technology is one of the main key to prepare every graduate to help them to be ready for working. For achieving that goal, vocational education institutions must prioritize the development of education system oriented towards the improvement of graduate quality who are professional, hard worker, disciplinarian, and uphold to the nation culture.

Various parties say that the programs implemented in vocational school still have not suitable with the fact in world of work yet, have not fulfill the expected competences yet that causes so many cases about the number of unemployment. Directorate of Vocational Education and Training and Directorate General of Primary and Secondary Education of the Ministry of Education and Culture have attempted to do many efforts for improving the quality of vocational school program by providing additional constructions of physical facilities building, providing practice equipment,

procurement and upgrading of teachers and improving its curriculum development.

Until now, the development of vocational education implementation has shown a good enough result. However, it must be realized that there are some problems when implementing the program that creates doubting effectiveness, and even the existence of vocational education as one of feature way in improving competences and competitiveness human resources are still questionable. Sumarno (2008) argues that up to nowadays, vocational education still faces qualitative and quantitative equivalence obstacles. The former occurs due to the technology development in industry very rapidly so it creates a gap between competences owned by the vocational school graduates with the competence required by industry world, while, the latter happen because of imbalance between the job vacancy and the job seeker.

Louis L Warren (2004) thinks that some problems which often occur, such as the limited tools and facilities of vocational schools still far left behind the condition in industry. Sulipan's research result (2004) concludes that there is still a big gap between available tools in vocational school and industry. Furthermore, he also states that vocational school still unable to empower all potency and resource in its environment. If students are given a chance to do self-development well based upon the ability of their schools, then it does not create a maximum student understanding. It is caused by the limited of school's tools ability and resources. Thus, it is highly recommended by Sulipan, to reach the expected competence needs a good cooperation between industry side and school in empowering all available potency and resources.

For vocational education, the cooperation built with industry side is an appropriate thing, particularly in developing resources (Lawrence C. Scharmann, 2007). Several studies (Marilyn J, Amey, Pamela L, C. Casey Ozaki (2007)) suggest that this cooperation is expected to make the best use of its facilities; moreover, other studies (Trace Allen, 2007; and McLean, 2004) argue that the cooperation will bring a good big impact for those parties, particularly as tools

improvement.

Industry world as a partner must run well and develop together with vocational education world. Therefore, those parties should be able to work together to reach their goal. According to Ian Smith (2006), Partnership approach is the best form that is applicable for both parties. The previous argument is supported by Henrietta Bernal (2004) and Susan Bodilly, et. al (2004), who believe that increased utilization and empowering all potency and resources in the school's environment will help to improve the cooperation. It is expected that they can establish a community that is mutually beneficial in solving any problems encountered together.

Starting from that several problems, it is necessary to do effort from education institutions and business world to develop education together, in order to achieve their goals well and in harmony. The form of which is to harmonize and to develop a sustainable communication towards the condition and development of industry as well the needs of industry competence to be suitable with vocational school's education program, so the students will get enough skills and adequate to compete in work world, beside that the business world will have a high quality and qualified employee in accordance with specification and needs required.

Vocational school must be able to develop its cooperation network in improving organization and to reach education goal (Ori Eyal, 2008). Networking is very important for the sustainability and improvement of an organization, and even a country. Cooperation can be considered as basic needs for vocational school to follow up its productive aspect of learning as vocational school's specific characteristic. Developing cooperation network which is built by vocational schools and industry world is really possible for school to give a chance as wide as possible for students to get supply of productive skills that accords with society's needs.

II. METHOD

This research is intended to uncover various phenomenon in vocational schools and industry world, in order to evaluate the

implementation and effectiveness of collaboration partnership between vocational school and industry side which has been implemented, as well as to know about benefit gained by those parties. To select an issue, case, or conjuncture in details and a much deeper on a certain program, then it is used a qualitative research approach based upon constructionism with multiple realities assumption which is socially built through individual and collective perception when observing the same situation.

Selected setting within this study is a natural setting which means the researcher does not do any treatment or experiment towards the process and the result of achieved program. When it is obtained a qualitative data, then the researcher analyze it in a simple-qualitative way before analyzing it overall in qualitative analysis. Gaining process of the data is well done through observation, interview, inquiry, while to get the valid data uses triangulation data source and triangulation method.

III. RESULT AND DISCUSSION

School productivity means an ability of school towards the achievement of its goals about (1) academics achievements (2) non-academics achievements (3) the amount of repeaters and (4) the number of dropouts. As the result of which, it can bring a better impact to all graduates of the school to : (1) get a job opportunity in accordance with his/her competence; (2) get an occasion to continue their study to the higher level; (3) develop the graduates potency for creating their own business in line with the potency they own. In non-academics life, the performance of vocational school in Yogyakarta city has shown a good performance in each competition they follow at local level, province, and even national level. However, for vocational school, the more important thing is the number of absorption of vocational graduates in the world of work at averagely 72.7% for state vocational school and 40.82% for private vocational school with the length of job search since graduated is around six months. Besides, there are also some graduates who have not gotten job yet as much as 21.96% and only about 4.72% of whom continue their study to university,

while 18.85% of each graduates per year turn to be entrepreneurs.

Implementation of vocational school policy with School-Based Quality Improvement Management which provides a bigger autonomy for the head master, gives flexibility to head master and encourages direct participation from everyone in school and society in improving the quality of education, starting from planning step, implementation as well as evaluation and the follow up step. Some activities which involve industry in planning usually packaged in form of meeting and workshop of arranging and validating curriculum, PKL/PSG for students in grade XI, training and apprenticeship for teacher and technician, competence test for students in grade XIII, developing production unit and service which is held in school, and developing a class designed only for industry.

All tasks and activities which relates to the quality development program are implemented by team developer as one of strategic aspect from partnership cooperation, which is sagaciously expected can build a better future of vocational school through sharing session (problem, information, experience and solution), in order to encourage their self-development in a better quality through internal dynamics, analyzing daily tasks, which is implemented by self renewal capacity, performing competitively in school organization that is good in the middle of society change fast, complex, and dynamics.

In the cooperation program which is implemented with industry world, criterion used in this evaluation is the amount of the result that has been reached by school, particularly for helping the students to be able for entering work life.

According to the findings above, it can be concluded that vocational school has not optimize yet the networking (partnership network) which has been connected well with companies/industries. The network which has not been reached the maximum level yet is used for developing school, and also it has not optimized all potency of school. Thing which needs to observe here is implementation of vocational school is supposed to be based on ICT (information and communication technology). In other

words, the cooperation with the industry does not need to be face to face, but it can be done by cyberspace.

The model development of the improvement of partnership-based vocational education quality is initiated by the approach of education management coming from thinking of consideration, needs and expectation of work life. It can be said that schools will implement society's need and desire as well as work life which means that it is not for obeying the government's rule only. The role and participation of the society are highly needed during planning process, implementation process, and evaluation.

It is found the strength of cooperation between school and work world within the model in which their ability collaborate to face all obstacles and develop issues, that are able to be transformed in a policy of their works. It is expected that it can occur participation and responsibility of entrepreneurship world to develop education which is suitable with the needs in work world.

IV. CONCLUSION

Based on the result of this research, it is gained empirical data related to something about partnership cooperation between vocational schools and industry world. The findings show that the partnership cooperation is an important thing that is highly needed to build by both parties to reach their goal together. According to the result of this research and the discussion which has been explained before, there are some points of conclusion which are outlined as follows.

One of vocational school's efforts to improve the efficiency and effectiveness of education in achieving high quality education is by exploiting all resource and power sharing with stakeholder in cooperation frame of vocational school and industry world.

Vocational school should be able to observe the achievements of educational quality more sharply, especially towards the target and objectives of vocational education which is relevant with industry world that will be implemented by School-Based Quality Improvement Management. The strategy to

increase stakeholder participation can be done by creating a new policy which is suitable with stakeholder expectation in order to invite all stakeholders to contribute and having responsibility towards the policy that has been arranged.

Through this research, it is found that partnership between vocational schools and industry world can bring a good impact toward school performance, as well as in fulfilling National Education Standards (NES), and also in developing school, as well as in improving absorption graduate through the improvement of students' competence.

It is expected that the headmaster of the school is able to develop leadership in empowering all school resources and the industry. There are some aspects that are strongly needed to develop by the principal to improve benefit of the partnership, such as : (1) To develop openness and trust between the schools and industry partners; (2) To involve the industry partners in arranging school strategic planning; (3) To empower and involve industry partners in developing ability and competence of productive teacher and technician through apprentice; (4) To empower industry partners in developing medium and facility of learning, particularly in developing learning process in order to be in line with the demand and the technology development of industry partners; and (5) To revitalize the function of school's team developer in mobilizing all industry partners' potency in developing the school itself.

REFERENCES

- Allen, Trace. (2007). *Building successful partnerships: lessons from the Specialist Schools Achievement Programme (SSAP)*. School Leadership and Management Journal, Vol. 27, No. 3, July 2007, pp. 301-312.
- Bernal, Henrietta (2004). *Essential Concepts in Developing Community-University Partnerships*. Public Health Nursing Vol. 21 No. 1, pp. 32-40. Blackwell Publishing, Inc.
- Calhoun, Calfrey C and Finch, Alton V. (1982), *Vocational Education: concepts and operation*. Belmont: Wadsworth Publishing Co.
- Clarke, Linda and Winch, Christopher. (2007), *Vocational Education : International Approaches, Development and System*, Oxon : Routledge
- Lawrence C. Scharmann. (2007). *A Dynamic Professional Development School Partnership in Science Education*. The Journal of Educational Research. Copyright © 2007 Heldref Publications March/April 2007 [Vol. 100(No. 4)]
- Louis L . Warren and Henry A. Peel. (2004). *Collaborative Model For School Reform Thought A Rural School/University Partnership*. Education Journal Vol. 126 No. 2
- Marilyn J, Amey, Pamela L, C. Casey Ozaki. (2007). *Demands for Partnership and Collaboration in Higher Education: A Model*. New Directions For Community Colleges, no. 139, Fall 2007. Wiley Periodicals, Inc.
- McLean, E. James and Behringer A. Bruce. (2004). *Establishing and evaluating equitable partnership*. Journal of community engagement and scholarship Vol. 1 No. 1
- Smith, Ian (2006). *Models of partnership developments in initial teacher education in the four components of the United Kingdom: recent trends and current challenges*. Journal of Education for Teaching Vol. 32, No. 2, May 2006, pp. 147-164. Taylor & Francis
- Sulipan, (2004). *Pengelolaan pendidikan dan pelatihan berbasis kompetensi kejuruan pada Sekolah Menengah Kejuruan*. Abstrak Disertasi. Bandung : PPS-UPI. Diambil dari situs : (<http://pages-yourfavorite.com/ppsupi/disertasi2004.html>08-2006).
- Sumarno, (2008). *Employability Skills dan Pengaruhnya Terhadap Penghasilan Lulusan SMK Teknologi dan Industri*, Jurnal Kependidikan Lembaga Penelitian UNY, Tahun XXXVIII, Nomor 1, Mei 2008, Yogyakarta: LLPM UNY,
- Susan Bodilly, et. All (2004). *Challenges and potential of a collaborative approach to education reform*. RAND Corporation : Santa Monica, California

THE QUALITY OF ELECTRONIC APPLICATION COMPETITION IN VOCATIONAL HIGH SCHOOL BASED ON HIGHER ORDER THINKING SKILLS

Muslikhin¹, Muh. Munir², Poncowali Pranoto³

^{1,2,3}Electronics Education Dept., Yogyakarta State University - Indonesia
email: muslikhin@uny.ac.id

ABSTRACT

Implementation of Higher Order Thinking Skills (HOTS) in Vocational High School only a small portion can be done by students in Indonesia, the Electronic Application Competition was held yearly. The competition was characterized HOTS, consisting of reverse engineering, prototype design, fault finding and measurement, and assembly project. This paper aims to reveal the quality of participants in the competition based on HOTS criteria. The authentic assessment and CITE questionnaire were distributed to measure quality of competition and learning style. The population in this study were all participants of electronic application competition, totaling 27 students from 26 schools in Yogyakarta, was held on 2015. Data were obtained from a sample of absolute then processed using quantitative method. The results of electronic application quality based on HOTS can be depict: (1) the quality of the electronic application competition judged by the criteria HOTS only 68% of participants who have applied in the competition, (2) the results of the competition is directly proportional to the level HOTS, which means that more higher achievements of the participants also the better in HOTS implementation, (3) score participant can demonstrate learning styles vary according to criteria of CITE.

Keywords: higher order thinking skills, learning style, electronics application competition, vocational high school, CITE

I. INTRODUCTION

Since 1995 Indonesia has always contributed to the event of ASEAN Skills Competition (ASC). Skill competed in the ASC covers various fields, one of which is a field of electronic application. Until ASC XI 2016 in Kuala Lumpur, the electronic applied field continues to be competed. In Indonesia, screening process for potential participants started at the provincial level.

Although ASC focuses on skill, but the competition has the HOTS content coverage is very strong. It can be seen from the material competition is divided into four sessions; 1) reverse engineering, 2) prototype design, 3) fault finding and 4) measurement, and assembly project. At the actual competition tested participants not only their skills but rather on the ability to think of diagnosis, analysis, deep thinking, precise, and decision making.

The participant of competition is the choice of vocational high school students in Yogyakarta who have skills on; 1) audio video, 2) industrial electronics, and 3) electronics telecommunications. Generally, participants are sent to the provincial level has been through the internal selection

process of the school. Laymen think that the participants of the competition have the same learning style and tend to stand out on psychomotor aspects. Other candidates also lead to the best results of this competition leads to a particular learning style. The quality of the results of a competition electronics relies heavily on the ability of participants in non-algorithmic thinking, complex, self regulation, meaningful, effortful, and provide some solutions, nuanced judgments, providing multiple criteria and uncertainty.

HOTS are defined as the expanded use of the mind to meet new challenges, and the new challenge is to be the best in the competition. The characteristic of the four sessions of such competition is part of the HOTS. HOTS in electronic application so this is very important. Complex thinking ability is fundamental in the completion of the competition. Through the thinking skills of participants will discover how to solve a problem, the speed and effectiveness of the settlement. This shows that the ability to think is important for students to solve problems in the process of competition.

HOTs is an internal process that develops over time. This is an effort that takes time in which participants have to reflect and articulate, to justify, to interact, discuss, ask all in one frame time. (Sparapani, 1998). Rate of HOTs should be directed to cherish and fancy ability not only mastery of the content. It has become the norm that the purpose of content is prioritized over think about the purpose (Zohar, 2013).

That allegations needs to be studied further, because in electronic application competition participants tend to have common criteria. According to the theory CITE closely related with the HOTs so need suspected that the learning style of competition is not uniform (Chang, 2005: 77). Problems are resolved through HOTs like in this competition signifies a glimpse of the learning style is the same. Therefore, authentic assessment results of the competition are an important key (Babich, et.al, 1979).

Authentic assessment is the measurement of intellectual accomplishments that are worthwhile, significant, and meaningful, as contrasted to multiple choice standardized tests. Authentic assessment can be devised by teacher or in collaboration with student by engaging student voice. When applying authentic assessment to student learning and achievement, a teacher applies criteria related to "construction of knowledge, disciplined inquiry, and the value of achievement beyond the school." (Rajendran, 2002).

Authentic assessment tends to focus on contextualised tasks, enabling students to demonstrate their competency in a more 'authentic' setting (S. Geoffrey, 1998:23-25). Examples of authentic assessment categories include: 1) performance of the skills, or demonstrating use of a particular knowledge, 2) simulations and role plays, and 3) studio portfolios, strategically selecting items. According to Ormiston, Authentic learning mirrors the tasks and problem solving that are required in the reality outside of school (Ormiston, 2011: 2-3).

This framework for assessment begins the same way curriculum design, with the question: what should student be able to do? Once the instructor answers that question, they can then devise a rubric to evaluate how well a student demonstrates the ability to complete the task. Because most authentic assessments require a judgement of the degree of quality, they tend toward the subjective end of the assessment scale. Rubrics are an attempt to make subjective measurements as objective, clear, consistent, and as defensible as possible by explicitly defining the criteria on which performance or achievement should be judged.

This paper will perceive the quality of the electronic application competition with based on HOTs and CITE criterions. The results of this analysis are expected to gain a complete profile and learning style of participants. These results are beneficial as an input for the improvement of training development in Vocational High School to prepare participant candidates in electronic application competition.

II. METHOD

The respondents were students of Vocational High School enrolled in electronic application competition at Yogyakarta State University during the 2015. A total of 27 participants took part in the study, came from 26 schools.

The instrument was a CITE learning style consisting of 45 Likert scale questioners, type of questions covering topics in learning habits. The area grouping of HOTs was based on the criteria of Murdoch Teachers Taxonomy (Marzano, 2000). The performance of students in electronic application competition was measured based on their final output. A four point Likert scale was used to determine the level of HOTs of the participants based on their scores.

III. RESULT AND DISCUSSION

The results of this paper show the quality of electronics application competition were analyzed based on the HOTs criteria. The data obtained from population presented in Table 1.

Table 1. Result of electronic application competition

No.	Rank grouping	Score of competition		CITE index		Most dominant in CITE
		(average)	(std. dev.)	(average)	(std. dev.)	
1.	I (1-5)	76.20	1.72	12.80	2.23	EO
2.	II (6-10)	66.00	6.87	13.80	1.94	VL
3.	III (11-15)	51.00	2.76	13.60	2.80	AN
4.	IV (16-20)	45.40	1.50	12.20	3.31	AL
5.	V (>21)	37.71	1.79	12.29	1.16	EO-AN

Table 1 shows the result ranking 1 to 5 have an average of 76.20 with 12.8 CITE index, and dominant learning styles on Expressiveness-Oral (EO). For ranking group 6-10 and 11-15 have a range that is almost similar average successive results of the competition; 66 and 51; CITE index 13.08 and 13.06 respectively; and the dominance of learning styles in the Visual Learner (VL) and Auditory Numerical (AN).

Interesting data exist on the ranking group > 21 where the competition results average 37.71, CITE index 10.17 with the dominant learning style in EO and AN. The AN-EO value and decisively is exactly 12.29.

The quality of the electronic application in general can be seen from the existing ranks. But if we analyze based on criteria HOTS it will be found a pattern between the quality and the ability to complete the competition. Based on the criteria, HOTS is characterized by; 1) do a job is not routine, doing the work of thinking through the complex, trying to solve the problem with many alternative solutions, and suspected something with uncertainty and seeks stronger (Fisher 1999: 24).

Table 2. Role play of participants using HOTS in f electronic application competition

HOTS criteria	Freq. Rank Grouping				
	I	II	III	IV	V
Not Routine Participants work on reverse engineering to match the number of components first and then draw the outline of the direction input.	5	4	4	3	2
Complex Participants worked on a prototype design considering the existing components, input, output, and read the datasheet that the prototype can work perfectly.	5	3	2	3	2
Yields Multiple Solutions The participant of the session working on finding fault, measurement, and repair to diagnose and analyze three possible hardware failures before being measured.	4	5	3	2	3
Involves Uncertainty and Effortful Participants work on assembly projects by check, simulate through a laptop before transfer to the hardware, work tactically current PCB fabrication, assembly, think of all the possibility of failure and maintain concentration in this session for 360 minutes.	4	4	3	3	4
Average	4.5	4	3	2.75	2.75
Percentage (%)	90	80	60	55	55
Categories	excel.	good	moderate	poor	poor

The data in Table 2 depicts that rankings groups I and II showed the quality of the participants. The quality in question is the ability of students to use in completing the competition HOTS content. It is seen that for group I and II have implemented HOTS methods respectively 90% and 80%. In this case all participants in the group I work out of the ordinary. For example when entering a Fault Finding, Measurement and Repair session with time of 180 minutes, only completed less than 90 minutes. Difference time utilized by the participants of the group I to pursue the project Assembly session. Why choose participants quickly devolve into this session because it would be many stages are passed. Accuracy and complex thinking is necessary, it looks like Figure 1.



Fig. 1 Participants have completed the assembly session earlier than the others

While the results of observations in group V (the lowest rank) showed only two participants who do work in non-routine. Participants tend to think coherently appropriate what is in question. However, the criteria involves uncertainty and effortful participants 55% of this group working on the project assembly with the thought of the possibility of failure and try to finish as quickly as possible.

Interesting to observe the criteria for complex thinking began to group I until V, only group I were to apply this criterion. The rest is just the range of 2-3 participants who perform complex thinking how to solve the challenges of competition. One of example is shown in Figure 2.



Fig. 2 One of participant drawing scheme while others assembly components

A glimpse of how committed participant in Figure 2 will be spending time. Instead, it made the participants tried to apply the HOTS criteria. It is means that participants have to apply the criteria of non-routine; because the solution is different from each other. In addition they also have to apply complex criteria and yield multiple solutions in electronics competition; in a way that has taken the HOTS has been applied by the participants (Fig.2).

The quality of participants in the electronic application competition very varied. If the percentage is only 68% that apply HOTS criteria in of the competition, it is still 32% that have not been tapped HOTS dominated by rank group IV and V. Based on table 1 and table 2 the quality of the competition can be pursued in learning styles of participants.

According to the principles of learning these output were favorably affected both inputs and processes. Therefore it can be attributed to the quality of learning style competition with a tendency interesting. Quality ranking group I have the style Expressiveness-Oral (EO) with the ability to stand on a non-routine and complex thinking. Ranking group II, III and IV have individual learning styles Visual Learner (VL), Auditory Numerical (AN), and Auditory Language (AU). As for the ranking group V there is a tendency to have two equally dominant learning style Expressiveness-Oral (EO) and Auditory Numerical (AN).

IV. CONCLUSION

Based on the result and discussion regarding the quality of electronic application competition based on HOTs can be summarized as follows: (1) the quality of the electronic competition judged by the HOTs criteria only 68% of participants who have applied in the competition, (2) the results of the competition is directly proportional to the HOTs, which means that more higher achievements of the participants, also the better in HOTs implementation, (3) score participant can demonstrate learning styles vary according to criteria of CITE.

REFERENCES

- A. Chang, J. Ea, and O. S. Tan, (2005) *“Thinking about Thinking: What Educators Need to Know,”* Singapore: National Institute of Education, Nanyang Technological University, Mc. Grawhill Education, pp. 72.
- A. Shahwin. (2016). *1.153 Siswa Ikuti Lomba Kompetensi Siswa (LKS) SMK 2016 di Malang.* Retrieved from <http://www.kemdikbud.go.id/main/blog/2016/05/1153-siswa-ikuti-lomba-kompetensi-siswa-lks-smk-2016-di-malang>.
- A. Zohar. (2013). *Challenges in wide scale implementation efforts to foster higher order thinking (HOT) in science education across a whole wide system.* *Thinking Skills and Creativity*, 10, 233-249. Retrieved from <http://ac.elscdn.com/S1871187113000412/1-s2.0-S1871187113000412-main.pdf?>
- A. M. Babich, Burdine, et.al. (1976) *CITE Learning Styles Instrument.* Retrieved from www.spcollege.edu/hec/nip/Workshops/2011/spring/LearningStyles.pdf
- ASC. (2011). *Rules and Procedures of ASEAN Skills Competition IX.* Retrieved from http://archive.worldskills.org/2012ASEAN/assets/document/Annex_6_-_rules_and_procedures.pdf
- DITPSMK (2016). *Informasi Bidang Lomba Kompetensi Siswa (LKS) SMK Tahun 2017* Retrieved from <https://pesertadidik.ditpsmk.net/artikel/56/informasi-bidang-lomba-kompetensi-siswa-lks-smk-tahun-2017>.
- F. Sparapani, E. (1998). *Encouraging thinking in high school and middle school: Constraints and possibilities.* *The Clearing House*, 71(5), 274-276. Retrieved from <http://ezproxy.um.edu.my:2057/stable/pdfplus/10.2307/30189372.pdf>
- M. Ormiston. (2011). *Creating a Digital-Rich Classroom: Teaching & Learning in a Web 2.0 World. Solution.* Tree Press. pp. 2-3.
- N. Rajendran, (2002). *Using constructivist approach to teach higher-order thinking skills: Transforming teaching practice to facilitate mindful learning.* Paper presented at the 10th International Conference on Thinking. Retrieved from <http://www.nsrjendran.com/documents/articles/harrogate2002.pdf>
- R. Fisher, (1999). *Thinking skills to thinking schools: Ways to develop children's thinking and learning.* *Early Child Development and Care*, 153, 51-63.
- R. Marzano, J. (2000). *Designing a new taxonomy of educational objectives.* Thousand Oaks, CA: Corwin Press.
- S. Geoffrey; F. M. Newman (1998). *Authentic Intellectual Work in Social Studies: Putting Performance before Pedagogy.* *Social Education*, vol. 62.1: 23-25.
- W. Tindall, L. et. al. (1980). *Puzzled about educating special needs students?: A handbook on modifying vocational curricula for handicapped students.* Madison, WI: Wisconsin Vocational Studies Center, University of Wisconsin.

LABOR PRODUCTIVITY UP WITH DEBURRING TOOL IN GEAR PROCESSING, A CASE OF STUDENT INDUSTRIAL INTERNSHIP PROGRAM

Gamawan Ananto¹, Aji Yudistira²

^{1,2} Mechanical Engineering Dept, Bandung State Polytechnic For Manufacturing
e-mail: waloeyo_gamawan@yahoo.co.uk

ABSTRACT

This is a case in one mid scale industry who produced kind of gears for certain engine for agriculture mechanization. The viewed topic is only shaping and deburring process that had to be carried out to the four gear sub variants which are highlighted separately from the whole task series in the system. It is found that this deburring is doing by hand work manually and caused consequences such as risks from safety point of view and compulsion of special operator assignment. In this program there was one diploma student who followed the Industrial Internship Program in such company that is involved and had to participate into the development team. Qualitatively, the action steps are formulate the problem in existing operation, collect and analyze its data, and define possible recommendation or solution. A Deburring Tool then created, designed, manufactured and implemented as a trial in one gear sub variant that is operated integratedly with the shaping machine process. As it is successfully worked, the other four units are followed to be made. Using this tools, in addition to one operator who assigned for risky manual work is omitted, the total output could be increased up to 121 from 98 per day and labor productivity became 3.7 instead of 2.4 pieces per man hour previously. Moreover; it is proven that the Industrial Internship Program is beneficial to the educational institution, the students, and the host company where the interns assigned to.

Keywords: productivity, student internship, manufacturing

I. INTRODUCTION

This manuscript examines a case in one mid scale industry who produced kind of gears for certain engine for agriculture mechanization. As each product of gear has number of process series, the viewed topic is only successive shaping and deburring that had to be carried out to the four gear sub variants which are highlighted separately from the whole task series in the production line system. It is found that this deburring is doing by hand work manually by one operator who get the works that is flowed from four different machines alternately. Apparently, this manual deburring process is not that elegant due to several consequences such as risky work from safety point of view and compulsion of special operator assignment.

The urge is to find possibility to improve such condition. As known, deburring is a process that has to be done after gear tooth profile machining. Therefore a substitution for this manual work is then initiated, with a simple tool that could

execute smoothen the workpiece corners around. If so, the number of workstation or operator might be reconsidered to decrease, that is probably also related with theoretical labor productivity, mentioned with quantity of unit produced divided by man hours used (Heizer and Render, 2006: 310). In order to check the better amount of product output regarding such productivity and also possibility of capacity improvement, it is fine to use SPT (shortest processing time) way to do the product sequencing that minimizes its flow time (Aeunike, 2012:14-16; Heizer and Render, 2006: 586).

Basically, the purpose is just to improve the productivity of the production sub line through a tool for substituting the manual deburring in four gear sub variants. Moreover, involving the student interns into the assigned team caused he or she could reach more experiences through exploring ideas and competency to improve something around in the workplace they responsible for, as it proven that the internship program is beneficial to the

university, the students, and the host organizations (Mgaya and Mbekomize, 2014: 142). Particularly, the students are gaining professional maturity before entering the real workplace as graduate engineers (Doel, 2009: 172). The assigned students in such company are involved to its daily technical activities, as the fact in some cases that interns was treated like full time staff (Bukaliya, 2012: 130).

II. METHOD

Since the interns student is involved into the small team to improve such work, such assignment will also help him/ her to understand theories learnt in classroom and enhanced their learning and understanding of issues relevant to their particular areas of study (Bukaliya, 2012: 130). The following “Fig.1” shows steps of action to solve the potential problem they faced which are referred to organization standard procedures.

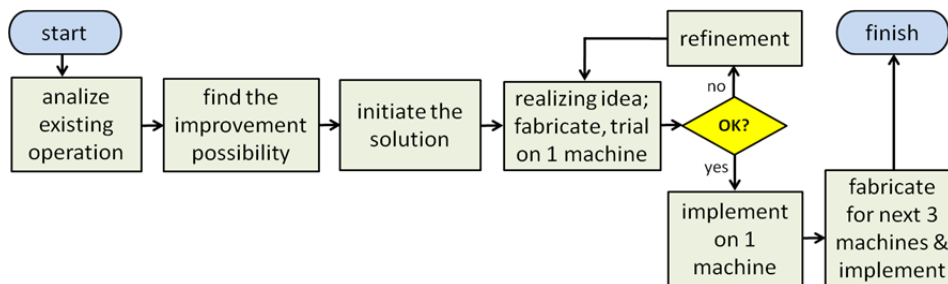


Fig. 1. Steps of actions

Qualitatively, the action step (Kuntjojo, 2009: 16) is started with determine the problem through elaborate the related things in existing operation; collect and analyze its data; define possible improvement possibility, recommendation or solution; --in this case-- create an equipment or tool to answer the problem or something that will be improved. A Deburring Tool then created, designed, manufactured and implemented as a trial in one product sub variant machine. If the trial successfully works, it then will be created and implemented for the next three machines.

III. RESULT AND DISCUSSION

3.1. Existing Operation

In a mid scale industry, a part of one production line of four gear sub variants is taken for improvement, that is consist of shaping and deburring operation successively. The shaping process as predecessor task use four defferent machines for each sub variant, but they flow into one work station or operator, who executes the shaping product output alternately for deburring, as shown by below mentioned “Fig.2”. The identity of each product is avowed by A, B, C and D with its

shaping processing time (Ts) and deburring processing time (Td) as well, in minute.

The first operator OPR-1 is assigned for A, B, C and D product that uses each shaping machine sequently, whereas the second operator OPR-2 had to do the deburring process for all of A, B, C and D in the same work station or equipment. This OPR-2, as stated previously, is doing teh deburring process by hand work manually with its consequences and risks of work.

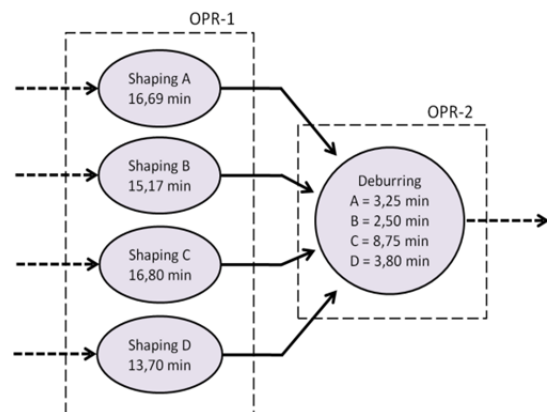


Fig. 2. The existing process diagram

The following “Table 1” shows the operation time of shaping (Ts) and deburring

(Td) in alphabetical order, that is summarized from “Fig.2”.

Table 1. Shaping and deburring operation time

Product	Ts (minute/ piece)	Td (minute/ piece)
A	16.69	3.25
B	15.17	2.50
C	16.80	8.75
D	13.77	3.80

Due to SPT (shortest processing time) method in sequencing, “Table 2” then mentioned the SPT order for deburring process that is taken from shaping output. With the normal working time 8 hours per day, the capability of each product is calculated through 480 minutes divided by its operation time, that is rounded down.

Table 2. Shaping SPT ordered and output capability

Product	Ts (minute/ piece)	Cap (pieces/ day)
D	13.77	34
B	15.17	31
A	16.69	28
C	16.80	28
Total :		121

Instead of using graphical gantt chart, the achievement of deburring process output is explained in “Table 3”, that displayed up to 4 cycles for check point. It is shown that the first product (B) had the flow time that is obtained from its Ts added with its Td: $15.17+2.5=17.67$, whereas the next (A) is resulted from its operation time added with previous first B flow time: $17.67+3.25=20.92$, and do so to the next amounts in such column down. For the next cycle that is started with B again, is filled with addition of C amount as the last product flow time on the first cycle to its operation time

$33.47+2.5=35.97$, and do so to the next amounts in such column down, and continuing to the next cycles.

The right section of the table shows the result of deburring process capability in pieces per day, that is calculated consecutively: ‘hours per cycle’ from cycle-4 divided by 60, ‘cycle per day’ that is calculated for 8 hours and ‘pieces per day’ by multiplying with 4 cycles, that are all rounded down.

3.2. Deburring tool for improvement

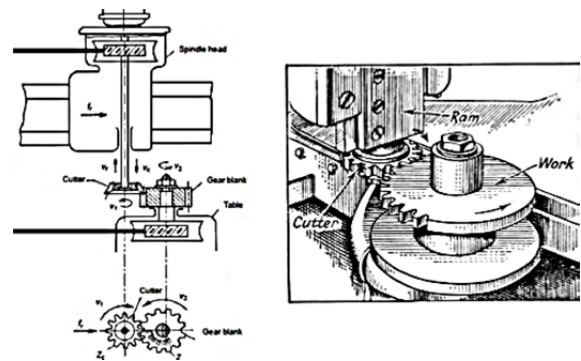


Fig. 3. The gear cutting principle

Considering explained obstacles, an equipment or tool is initiated to substitute manual handling for deburring process. A deburring tool is designed, manufactured and implemented as a trial in one gear sub variant that is operated integrately with the shaping machine process. The concepts of such tools is easily adopted from the cutting movement of manual work for smoothen the workpiece corners. In shaping process, it is mentioned on “Fig. 3” (Sharma, 2013: 21) that the gear cutting motion is vertical downward while rotating both the workpiece and the cutter.

Table 3. Deburring process achievement

Product	Td (minute/ piece)	Cycle-1	Cycle-2	Cycle-3	Cycle-4	Hours/ cycle	Cycle/ day	Pieces/ day
B	2.50	17.67	35.97	54.27	72.57	1.21	6.61	26
A	3.25	20.92	39.22	57.52	75.82	1.26	6.33	25
D	3.80	24.72	43.02	61.32	79.62	1.33	6.03	24
C	8.75	33.47	51.77	70.07	88.37	1.47	5.43	22
Total								98

As the side result of cutting process, the burr appears on the bottom of the workpiece and should be cutted away easily by moving a sharp blade horizontally on the related surface. The design of deburring tool unit that substituted manual work is shown on “Fig. 4”.

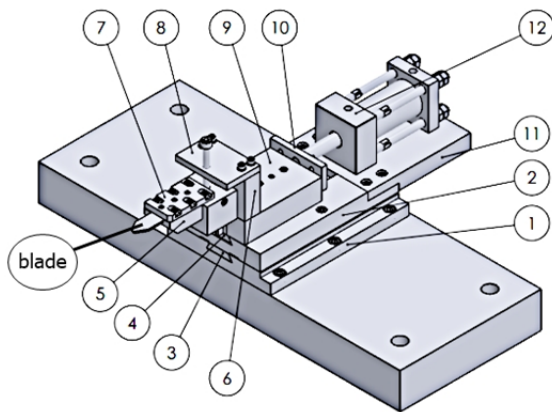


Fig. 4. The deburring tool unit

This deburring unit consists of several components such as blade, upper slide (part number 2), tool holder unit (part 6), height

adjuster (8) and pneumatic cylinder (12). How this equipment works as shown on “Fig. 5”. This deburring tool attached with the shaping machine, that also called hobbing machine in several cases. Before start with the operation, the height position of the blade has to be adjusted according to the dimension of certain workpiece, and has to be done once for the first workpiece only as the part of setup procedure.

The sub unit of upper slide then moves from the ready position to the working position below the surface of work, and the operation starts. While cutting operation occurs and both the work and cutter turns, the burrs will be cutted off by such blade along the rotation. At the end of operation the sub unit of upper slide moves back to ready position for next preparing. During the trial of this first prototype for one gear sub variant, refinement in minor improvements for necessary detail are held when its operation or function is not that suitable with the planned design.

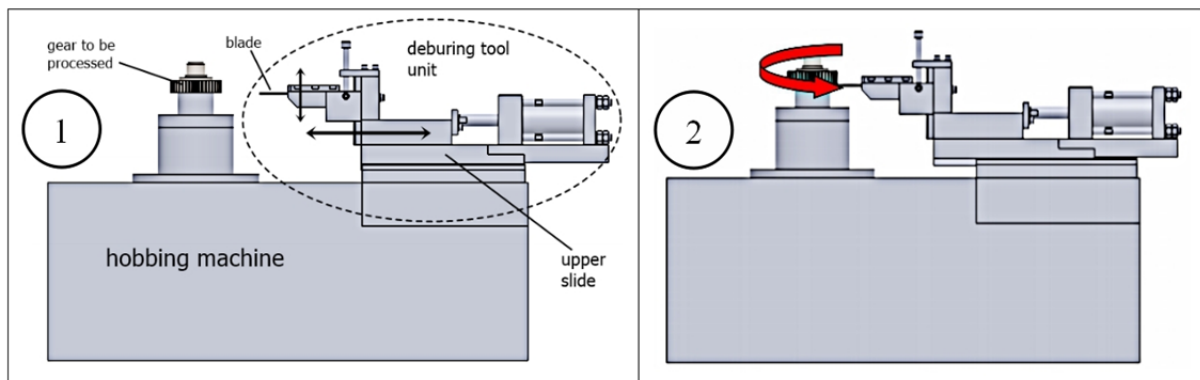


Fig. 5. How the deburring tool unit works

3.3. Impact and benefit

As the first prototype is successfully worked, the other four units are followed to be made for the next four shaping machines. Using this tools, the manual deburring process by OPR-2 is not needed any longer. The benefit is that risky manual work is quite eliminated and from the cost side is more economic due to one workforce ommitting.

Futhermore, the total output of the system is increased since the remain

operation is shaping only that operated by OPR-1, thus it had 121 pieces per day output as stated on “Table 2”, compared with previous achievement of 98 pieces per day on “Table 3”.

In addition, the increment of labor productivity could be also calculated as $121:(8 \times 5) = 3.7$ pieces per man hour after improvement from $98:(8 \times 5) = 2.4$ pieces per man hour previously.

IV. CONCLUSION

In a mid scale industry who produced kind of gear, one task in its production line that is operated manually, substituted by deburring tool. This improvement could increase its product output up to 121 from 102 per day, whereas the labor productivity became 3.7 instead of 2.4 pieces per man hour previously since one operator is omitted. As an interns students is involved and contributed in assigned team for such improvement, it is proven that the Industrial Internship Program is beneficial to the educational institution, the students, and the host company where the interns assigned to.

REFERENCES

- Aeunike, (2012), *Perencanaan dan Pengendalian Produksi*, TIN 4113, Universitas Brawijaya, <http://aeunike.lecture.ub.ac.id/files/2012/12/Pertemuan-13-14-PPC.pdf>, downloaded on July 2016.
- Bukaliya Richard, (2012) *The Potential Benefits and Challenges of Internship Programmes in an ODL Institution: A Case for The Zimbabwe Open University*, International Journal on New Trends and Their Implications, Volume: 3, Issue: 1, Article: 13, ISSN 11309-6249.
- Dan Reid R. and Sanders Nada R., (2005), *Operations Management*, Wiley, 2nd Edition.
- Doel Susan, (2009), *Fostering student reflection during engineering internships*, Asia-Pacific Journal of Cooperative Education, 10(3), pp. 163-177.
- Heizer Jay and Render Barry, (2006) *Operations Management*, Prentice Hall
- Kuntjojo, (2009), *Metodologi Penelitian*, <https://ebekunt.files.wordpress.com/2009/04/metodologi-penelitian.pdf>, downloaded on July 2016.
- Mgaya K., and Mbekomize C., (2014), *Benefits to host organizations from participating in internship programs in Botswana*, Asia-Pacific Journal of Cooperative Education, 15(2), 129-144.
- Sharma Vikrant, (2013), *Gear Cutting, ME312 Manufacturing Technology, Mechanical Engineering Dept, FET-MITS*, <http://www.slideshare.net/shunty12/4-gear-manufacturing>, downloaded on July 2016

DEVELOPMENT OF CONTEXTUAL LEARNING TO INCREASE THE STUDENT KNOWLEDGE OF PILES IN FOUNDATION ENGINEERING

Nurlita Pertiwi

Universitas Negeri Makassar
E-mail: nurlita.pertiwi@yahoo.com

ABSTRACT

One competency to be achieved by the students in the engineering foundation course is the knowledge about the mechanism of mounting piles. In contextual, these mechanisms is very difficult due to the complexity of the equipment, stage work and complex technical requirements. The objectives of this research are to develop a Contextual Model Learning to increase the knowledge student about working of pile as foundation engineering and to measure the effectiveness of model. The development model refers to Dick and Carey model learning. The trial of model was conducted on 30 students who were taking courses foundation engineering. The effectiveness of the model is calculated by N Gain analysis based on data from the pre-test and post test. The result shows that : 1) The learning model used prototype of working method of pile. The prototype evaluation includes equipment, stages of processing and the technical requirements of the pile. 2) Effectiveness learning model was evaluated on improving students' knowledge of the working methods of pile foundation. The learning method is considered effective based on the N- Gage reached by the majority of students in the high category.

Keywords: contextual learning, piles method, learning model

I. INTRODUCTION

Competence of graduates in TVET institution must be in accordance with the development of industry. It is a requirement of the policy of the ASEAN Economic Community. Building Engineering Education is one of the courses that require technical abilities of graduates in the field of Civil Engineering. Therefore, the progress of the construction industry should be well understood by every graduate to be able to compete with human resources from other country.

One of the subjects at the Department of Technical Engineering Building Education is a foundation that provides an understanding of the foundation work. One type of foundation that is difficult to understand by the students is the process of implementation of the work piling. This is caused by the use of complex equipment, stage work and the complex technical requirements. Therefore, it is necessary to develop an effective learning model can improve student knowledge about the work piling

One model of learning which is assessed according to these difficulties is to

provide students with experience in the real world. With this experience, students can better understand the stages of implementation of the work piling.

Contextual teaching and learning is a conception of teaching and learning that helps teachers relate subject matter content to real world situations; and motivates students to make connections between knowledge and its applications to their lives as family members, citizens, and workers and engage in the hard work that learning requires (Berns and Erickson, 2001).

Experience workmanship piles can be provided by using a prototype media depicting a model set of tools and a job step stake in the field. In addition, students also have to understand the concept of load transfer of the stake to the ground. There are two function of pile foundations are to transmit a foundation load to a solid ground and to resist vertical, lateral and uplift load. These piles transfer their load on to a firm stratum located at a considerable depth below the base of the structure and they derive most of their carrying capacity from the penetration resistance of the soil at the toe of the pile.

The pile behaves as an ordinary column and should be designed as such. Even in weak soil a pile will not fail by buckling and this effect need only be considered if part of the pile is unsupported, i.e. if it is in either air or water. Load is transmitted to the soil through friction or cohesion. But sometimes, the soil surrounding the pile may adhere to the surface of the pile and causes (Abebe and Smith, 2003).

Specifically, Kelley (2001) stated that the prototype is one of problem solving to introduce a product or service. Prototype method makes it easy for others to

understand a series of complex projects. Prototype is good to give the development of thought for others that foster innovation and motivation.

Pile foundation works to support the load of the building and transmit loads to the ground towards the base. The bearing capacity of pile foundation should be greater than the large expenses incurred so that it can withstand the building safely. (Tambunan, 2012). Installation of precast pile is commonly done in the field is to do with a hammer pulverization.

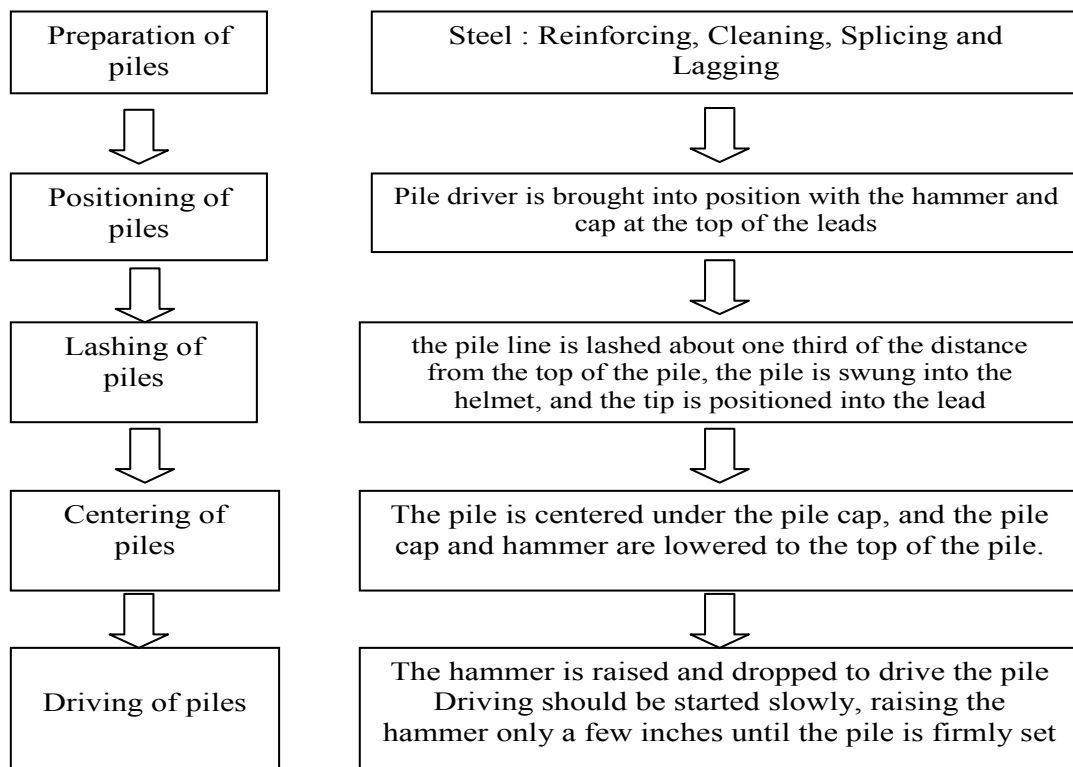


Fig 1. Installation of Pile (Abebe and Smith, 2003)

Piles stake system can be done with hydraulic drop hammer system and jacked piling system. Method Drop Hammer System has the following technical specifications: type of pole used is triangular (28 cm; 32 cm) or rectangular (20 cm; 25 cm), Height fall of hammer is 1 meter, weight of hammer is 1500 kg. The advantage of this method is the cost of mobilization and demobilization of equipment cost as well as setting the equipment quickly. Methods hydraulic jacked piling system with technical

specifications: type of pole used is rectangular (20 cm; 25 cm), rectangular press capacity of 20 cm is 70 tons, rectangular press capacity of 25 cm is 100 tons, and the system of press jaw system. The advantage of this method is very little vibration when lining and no noise from a blow hammer because it uses a hydraulic system. (Nurdiani, 2013)

In the prototype, the necessary stages of processing the stake. In detail the stages are shown in the Figure 1.

II. METHOD

The development model refers to Dick and Carey model learning. The steps of learning described in the Fig. 2.

The trial of model was conducted on 30 students who were taking courses foundation engineering. The effectiveness of the model is calculated by N Gain analysis based on data from the pre-test and post test. Samples were students of Building Engineering Education that measuring the effectiveness of the learning model was calculated using the Gain test using the Hake formula (Meltzer, 2002)

$$N - Gain = \frac{S_{post} - S_{pre}}{S_{maks} - S_{pre}}$$

- N-Gain = effectiveness of methods
- Spost = Posttest Score
- Spre = Pretest score
- Smaks = High score

Interpretation of the results of N gain made based on table 1.

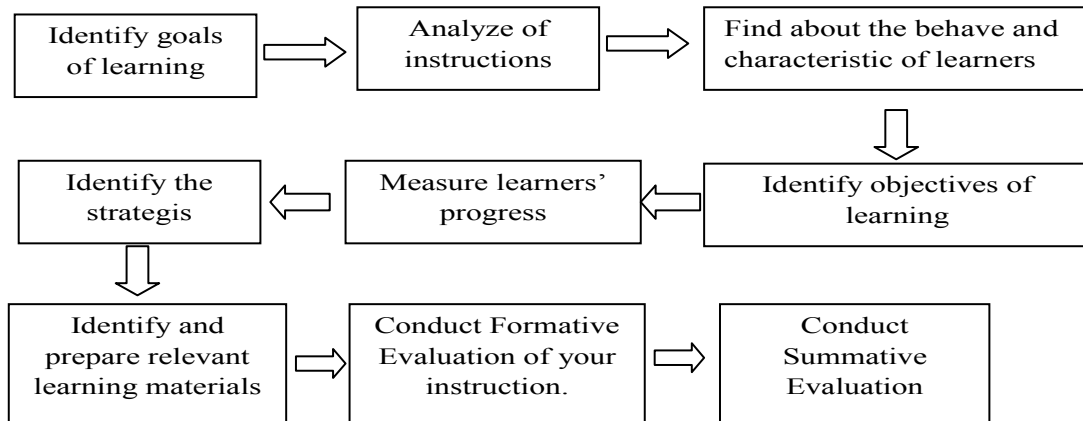


Figure 2. Steps of learning

Table 1. N-gain Category

Value	Category
G > 0,7	High
0,3 < G ≤ 0,7	Moderate
G ≤ 0,3	Low

Source: Meltzer, 2002

III. RESULT AND DISCUSSION

3.1. Learning Development Model

Stages of learning model development is done in stages as follows:

Goals of learning

The learning objectives are achieved knowledge of foundation engineering students about the concept of load transfer from the foundation to the ground as well as the knowledge of students about the stages

of processing the pile foundation with hydraulic jack system. This concept is the basis for students of Building Engineering Education in the development of the knowledge of the concept of other types of pile foundation.

Instructions

In theory Bowless, Foundation is a part of engineering systems that transmit the load supported by the foundation and its own weight to and into the soil and rock that lies underneath. Pile foundation is part of the structure that is used to receive and transfer (distribute) the load of the upper structure to support land located at certain depths. Piles are long and slender that distribute the load to the ground. The main materials of the pole is wood, steel, and concrete. Piles made of this material are beaten, drilled or

in the jack into the ground and connected to the pile cap (poer).

Additionally, depending on soil type, material characteristics and load distribution poles are classified differently. In Indonesia kind of piling on the market is spun pile, square pile, triangle pile, sheet pile, and others. Pile foundation by the use of materials and structural characteristics. Piles can be divided into several categories (Bowles, 1991) include: wood piles, concrete piles, Cast in Place Pile, steel piles, piles composite. Planning stake of piles supported by the data carrying capacity of the land. This is calculated based on the characteristics of soil.

Furthermore, the determination of the minimum depth of eligible security on the carrying capacity of land has been calculated. The size and depth of the foundation is determined by the carrying capacity permitted to be weighed against the decline of tolerance. If it turns out the results of the count are divided ultimate bearing capacity factors resulted in a decrease of excessive, foundation dimensions changed to a large decrease in eligible.

Implementation of the stake of the foundation carried with phase:

Piling Site preparation; Preparation tools and access piling are mobilization tool. Site preparation should also consider soils to be able to support the weight of the tool. When the elevation of the head end of the stake was below the original ground surface, the excavation must be carried out before piling.

Preparation of the piling in the ground; Preparation of the pile stored in the field should consider lifting point and the fulcrum for the storage of material, according to the technical instructions of the manufacturer of the piling.

Checkup the material piling; This is check performed to ensure that the material piling in accordance with the technical specifications of the job. Material piles must meet these requirements:

- No cracks, defects and broken
- Cross-sectional size and length should be in accordance with the specification and placement on construction drawings.

- Age of concrete must be sufficient for piling.

Preparation of piling tool; Piling tools with this kind of drop hammer should not be less than the amount of weight the pole along with a hat piling. As for the diesel hammer, weight hammer can not be less than half the weight the pole and its total piling cap plus 500 kg and a minimum of 2.2 tons.

Implementation of Piling; Piling ejected using a crane. Monitoring the implementation of the piling is by placing the pole at the point of the plan and examined the verticality of the two directions (X-Y cross section piles). During the execution of piling, high-fall hammer also monitored so as not to cause damage to the pole.

Connection of piling; After piling the first set, to connect the second pillar should be residue the piles on the ground as long as 30 cm for easy welding pole.

Piling pole connection; For piling pole connection, the activities carried out at the time of the previous piling. Final decision set to determine when termination piling based on decline of pole when hit. Decision of kalendering at the piling when nearing the top of pile required then implemented kalendering process.

Characteristic of learners

Characteristics of learners is mostly had low knowledge about the process of implementation of the work the piling. It is obtained from the pre test that shows the average value of 15.166.

Strategic

Learning strategy chosen was to create a prototype of piling activities. This model is designed to facilitate students to observe the stages of piling in the field. The tools used are:

- Aquarium as a soil media to illustrate clearly the working conditions on the work of piling actual field. Aquarium is made of fiber with a length of 40 cm, width 10 cm and high 30 cm.
- Leader crane to illustrate a steel beam as a reference a real hammer. This tool is a piece of metal pipe with a height of \pm 20 cm and carried pieces lengthwise using a

hand gurinda which serves for anchoring the crane hammer stand and made a small hole in the tip of the iron pipe piles

- Hammer cranes are piling hammer beater serves to grind the piling used as the foundation of a construction field.
- Pole stake illustrated with a plain iron diameter 10 cm length scaled.

Prototype model is presented in the Figure 3.



Figure 3. Piling Process Prototype Model

The learning model is applied to the class by the number of students by 30 participants with stage:

- Provides an understanding of the concept the piling and load transfer.
- Provide a description of the type of equipment used in the piling
- Describe the piling stages of processing which is accompanied by a demonstration on the prototype.
- To evaluate the learning outcome

Learners Progres

The results obtained in the learning process is an increase in student knowledge about the process of piling. It is based on the value of post test results that showed an average of 71.3 or high category.

Objective of Learning

By using a prototype model, the objective of learning is achieved. It's indicated by the increasing of student knowledge. This condition is supported with increased student motivation with their prototype models.

Effectiveness of Learning Models

As the evaluation of the learning model, the measurement of the effectiveness of the methods of N-Gain. Results of this analysis are presented in the Table 2:

Table 2. The Achievements of Student Knowledge

N-Gain Category	Frequ-ency	Percen-tage
Low	0	0
Moderate	13	43.33
High	17	56.67

Based on the results in the Table 2 indicate that most of the students have increasing knowledge. Value of N-Gain in the high category. This shows that the prototype model that is effective in achieving the learning objectives.

Model-based contextual learning which are prepared using the prototype stage of Dick and Carey is shown to improve the learning process is the increased motivation of students to understand the learning content. With motivations, more conducive learning environment and support the achievement of learning objectives.

By knowing the real situation in the construction world as well as the problems faced in the process of piling poles, then the skills students will increase. This is supported by Berns and Erickson (2001) that the knowledge and skills relate to students lives either now or in the future. Real-world situations and problems rarely represent only one discipline. The intent for the level of learning to rise so the students can better understands life situations (e.g., those presented at the workplace), identify and effectively solve problems, make wise decisions, and think creatively).

IV. CONCLUSION

The learning model used prototype of working method of pile. The prototype evaluation includes equipment, stages of processing and the technical requirements of the pile. Effectiveness learning model was evaluated on improving students' knowledge of the working methods of pile foundation. The learning method is considered effective

based on the N- Gage reached by the majority of students in the high category.

REFERENCES

- Abebe, Ascalew and Smith, Ian (2003) *Pile Foundation Design : A Student Guide*. School of the Built Environment, Napier University, Edinburgh.
- Berns, Robert. G and Erickson, Patricia.M. (2001). *Contextual Teaching and Learning: Preparing Students for the New Economy*. The Highlight Zone Research. U.S. Department of Education.
- Bowles, J. E. (1991) *Analisa dan Desain Pondasi, Edisi keempat Jilid 1*, Erlangga, Jakarta
- Kelley, T. (2001) *Prototyping Is The Shorthand Of Innovation*. Design Management Journal Summer 2001.
- Meltzer, David. (2002) *The Relationship Between Mathematics Preparation and Conceptual Learning in Physics: a Possible 'Hidden Variable' In Diagnostic Pretest Scores*. American Journal of Physics. 70, 1259-1268.
- Nurdiani, (2013). *Pekerjaan Pondasi Tiang Pancang: Cara Pemancangan, Kendala Dan Teknologi Terbaru*. ComTech Vol.4 No. 2 Desember 2013: 776-784
- Tambunan, Johnson. (2012). *Studi Analisis Daya Dukung Pondasi Tiang Pancang*. Jurnal Rancang Sipil Volume 1 Nomor 1, Desember 2012.

MOBILE LEARNING TRENDS AND CHALLENGES FOR VOCATIONAL EDUCATION IN INDONESIA

Ridwan Daud Mahande¹, Herman Dwi Surjono²

¹Engineering Faculty, Pepabri University In Makassar

²Engineering Faculty, Yogyakarta State University

e-mail: ridwan_dm@yahoo.com

ABSTRACT

Mobile learning is the development of e-learning and being a new technology trend in vocational education or modern learning. However, some of the challenges that occur in the ownership of mobile devices by citizens of vocational schools are the acceptance of mobile devices technology for meaningful learning, learning theory underlying the utilization, readiness of school community, ability of teachers, challenge of physical and social factors, inappropriate content for education and the absence of formal rules underlying the use of mobile learning in vocational education. To overcome these, then the first things to conduct are studying the use of mobile devices for learning, appropriate content indicators for vocational education, attitudes and behavior of users to use mobile devices for learning, and interaction of learning collaboration through mobile devices. This study was conducted by using and linking paradigm of learning theory, theory of FRAME model and technology acceptance theory (TPB, TAM and UTAUT2) to identify and describe the various aspects of the theory. This study is a preliminary study which is expected to contribute to the formulation of policies regarding the implementation and development of mobile learning for vocational education in Indonesia.

Keywords: mobile learning, vocational education, modern learning, challenges

I. INTRODUCTION

Vocational education as an employment-oriented education should prepare workers to meet the new needs of the industry through changes in vocational education system. This setup confirms the important role of vocational education in preparing students who have qualified and reliable resources through a combination of knowledge, skills and attitudes in accordance with technological developments in order to compete and enter the labor market.

Currently, the advances of technology confirm that the modernization of vocational education through ICT-based learning emphasizing aspects of technological innovation skills together to prepare a competence of learners of the 21st century is absolutely necessary. Modernization of learning based on a statement by Wilson (Zarini et al., 2009) confirms that the integration of ICT in vocational education will dominate the 21st century. These lessons emphasize the concept of technology that requires basic math, science, collaboration, communication skills, media

literacy, independent study and an understanding of technology in general which is very important to improve the competence of students in vocational education.

The challenge of the change in education world in the 21st century is in line with the statement of Wagner (2008) that there will be three fundamental transformation that require attention in the near future, namely: (1) the rapid evolution in this era of global knowledge economy which is very influential on the work world, (2) sudden changes in the availability of limited information in number becomes continuous and abundant information, and (3) the impact of increased media and technology on youth's learning and their relationship to the virtual world. Separately, there three transformations are certainly big challenges to the current education including vocational education. Therefore, this fundamentally forces us to rethink what to learn and how students should learn in today's global era.

The transformation has clearly affected the social life and the work world which are the bases or the orientations of vocational education itself. The changing job profiles and the quality of labor emphasize the aspects of computer technology using the internet/intranet in the working process to the impact on the quality needs of workers who have the technological competence. It is clearly seen as the booming technology, especially on computers to mobile devices such as smartphones and tablets with advanced application are very close to the users, especially learners who will be the ready-to-work generation.

This development certainly needs to be directed so these technologies have benefits for the development of competencies according to changes in the world of work and industry. Developments in information and technology with a very large investment are expected to build the new values of learners' community life to become more productive, be able to manage and optimize technology resources to take advantage of its potential. Therefore the development of technology as a result of globalization requires serious attention from various groups such as teachers, parents, and community leaders become very important in laying the foundation of technology education which is complete and correct.

The use of technology in learning vocational is directed to be more on the practical activities by integrating the knowledge, skills and attitudes as the process of competence. Competence in this study is the integration of knowledge, skills, and attitudes needed by someone to perform a task in the world of work. At the level of vocational education technology, the study focuses more on cognitive aspects in providing an understanding to the application of technology in learning. The attitude aspect emphasizes on ethical attitude in using technology, especially the midst of growing social media that can be accessed from a variety of media devices, particularly mobile devices. The psychomotor aspect is more on training in the use of technology applications in order to implement them based on the need to be more productive and useful.

The description above reinforces further the importance of using technology in learning vocational. This is in line with the principles and characteristics of vocational education itself that must be responsive and adaptive to technological developments (Sukamto, 1988; Djojonegoro, 1998; Sudira, 2012). This means the formulation of curriculum-based technology, teaching materials development and use of new technology prototype in vocational and practical learning with the development of the workforce in the context of local, national to regional need to be done. One type of vocational learning that is useful to align learning and training at the school with the world of work is a work-based learning.

Work-based learning can be on the job training and off the job training such as using the internet/intranet for guidance, simulation, video presentation, virtual laboratory, and others that use media technology, namely: e-learning and mobile learning. Mobile learning is the development of e-learning which is distinguished by the use of media technologies. If e-learning is the use of a larger and less dynamic device as a computer/laptop, the mobile learning uses mobile media which is more dynamic because it is smaller, lighter and easier to bring everywhere such as mobile phone/smartphone, ipad, tablet. New learning using mobile devices in vocational education will be used as a complement to formal and informal learning.

II. MOBILE LEARNING ON VOCATIONAL EDUCATION IN INDONESIA

2.1 Definition of Mobile Learning

Mobile learning is the development of e-learning and being a new technology trend in education or modern learning. Mobile learning is the next generation of e-learning and based on mobile devices (Ahmadi, et al., 2010). This statement was reinforced by Georgieva et al. (2011) that mobile learning was a relatively new trend in the development of e-learning, in which with the help of mobile device, the users had access to course material anywhere and anytime. A similar definition was proposed by Keskin & Metcalf (2011) that mobile learning was defined as the delivery of training through

mobile devices such as cell phones, PDA, digital audio players, digital cameras, voice recorders, pen scanner, etc. Thus, it can be formulated that mobile learning is a learning activity that uses the technology of mobile devices such as PDA, tablet PC, smartphones and phones to facilitate, support, enhance and extend the range of learning anywhere and anytime.

2.2 Benefits and Challenges of Mobile Learning in Vocational Education

Mobile learning in vocational education has the potential to expand where, how, and when we learn and perform in all aspects of our lives. According to Brown (2003) that the main benefits of m-learning is its potential to increase productivity by making learning available anywhere and anytime, which allows students to participate in educational activities without limitations of time and place. Mobile technology has the power to make learning more available and accessible than we used in e-learning environment. M-learning can be a first step towards a truly just-in-time learning where can actually access education and training in place and time required.

Furthermore, Peters (2007) asserts that when m-learning can be considered as part of the e-learning only has a difference in term of the flexibility of mobile learning which tends to be very close to the user because the portable is smaller and lighter so it is easy to bring everywhere. In addition, learners can have easy and inexpensive access to mobile phones, and mobile internet access fees that continue to diminish. The mobile device has enabled new ways to communicate among many people, especially young people in which mobile communication is part of everyday interaction, which is always on and connected with several community groups spreading throughout the area.

Mobile learning is an extension of e-learning that has potential as an extra, when, where and how students learn and perform in all aspects of their lives. Utilization of mobile learning in vocational education can provide advantages, namely: (1) learning can take place anywhere and anytime/flexible, (2) access to information learned fast and

broad impact on the performance of students in the learning environment, (3) two-way interaction and content collaboration, (4) the variation of learning that enables students to gain knowledge at their own pace / student centered, and (5) the motivation to multimedia resources can make learning fun (Sarrab et al., 2013; Gikas & Grant, 2013; Campanella, 2012; Hashemi, 2011).

In addition to the benefits offered from the utilization of mobile learning, there are some weaknesses as challenges for the development of mobile learning in education as described by Shuler (Pachler et al., 2010), namely: (1) the negative aspects of cognitive mobile learning. Physical challenge social must be addressed when the mobile device is inserted into the children's learning, (2) cultural norms and the manner in which most teachers see the phone only as a nuisance and feel that they have no place in schools, (3) there is no theory mobile learning which is currently not widely accepted by the theories of learning to mobile devices that have been run, hamper the effective assessment, pedagogy, and design new applications for learning, (4) access to different locations and wider where the difference between the mobile technology is a challenge for teachers and learners who want to accelerate academic results as well as users who are trying to facilitate learning, and (5) limiting the physical attributes which affect the usability of mobile device design and can distract children from learning objectives. In addition, mobile devices can prevent an optimal learning experience covers, limited text entry, a small screen, and limited battery life.

Some additions of mobile learning challenges above were written by Hashemi et al. (2011), namely: (a) a mobile device is much more powerful than the desktop, (b) the lack of a common operating system, (c) the lack of a hardware platform generally makes it difficult to develop content for all, (d) it is difficult to use motion graphics, particularly with mobile phones, although 3G and 4G will eventually allow this, (e) a mobile device has a fast-moving market, so that the device becomes obsolete faster, (f) the bandwidth can decrease with a larger

number of users when using a wireless network, and (g) difficulties with printing, unless connected to the network.

Based on the description of the benefits and challenges of mobile learning mentioned earlier, Jabbour (2013) from a different viewpoint asserts through his research that with the rapid rise of mobile technology capable of making everyday tasks more efficient, effective, and convenient, there is a desire that develops and needs to deploy new technologies in education. Research results also confirmed that the integration of mobile technology has no impact on students' attitudes. The use of mobile technology in the classroom was found to have an effect on students' attitudes toward mobile and attitudes towards the use of mobile devices in the classroom. Mobile devices in education can boost confidence of students and reduce students' anxiety.

Mobile learning offers a way to improve and enhance the conventional learning through mobile devices based learning to face practical obstacles and barriers in learning. Mobile learning offers an opportunity to move beyond the idea of conventional teaching and learning, and to devise new methods, practices and attractive format of the unique characteristics inherent in mobile devices. These characteristics come from the portability of the device, but there is also potential in connectivity for spontaneous communication and collaboration, providing instant information about the object in view, voice recording and camera to take photos and make video clips of learning.

Mobile learning in vocational education in Indonesia has the capacity to add, supplement to replace conventional learning practices. Mobile learning can be used in learning at home, the workplace and society in general. The mobile device can be more spontaneous, portable, personal, informal and everywhere. This will bring us closer to the learning that can be done anytime, anywhere. It is still too early to predict how the understanding of learning and teaching will evolve as a consequence. Therefore, the utilization needs to get more serious attention in order to study or excess features of the mobile device can be routed

to mobile learning in order to provide meaningful learning experiences for students.

Furthermore, Geddes (2004) quoted Liu et al. (2009) stated that mobile learning drove us to a new era of education and training. For companies in the world of work and industry, mobile learning helps to reduce traditional training infrastructure, facilitate the learning process and improve the effectiveness of production workers. At school, mobile learning provides a useful mechanism to enrich the learning experience of students, facilitate collaboration and informal interaction between students of the same age, which helps in building social capital and motivating the release or risk students. In addition, mobile learning can contribute to improve the accessibility, interoperability and reusability of educational resources, and to improve the interactivity and flexibility of learning at a convenient time and place, learning opportunities for all socioeconomic levels, especially those previously unreachable from the traditional educational approaches, such as dropping out of school (Attewell in Liu et al., 2009).

Continuing the statement of Shuler (Pachler et al., 2010) that one of the shortcomings of mobile learning is there is no the theory of mobile learning (no mobile theory of learning) that can be widely accepted by the theory of learning for a mobile device that has executed only hamper effective assessment, pedagogy, and design applications that are not based on actual learning. To answer or at least give a response to these drawbacks, the following describes learning theories that are often used in ICT-based learning such as e-learning to mobile learning itself.

III. LEARNING THEORY UNDERLYING MOBILE LEARNING

Mobile learning development can be seen as a complex process that does not just perform the steps in instructional design model. To develop an effective mobile learning required foundations of learning theory. There are three main learning theories used as the basis for mobile learning (Jacob & Issac, 2008; Keskin & Metcalf, 2011;

Tus et al., 2012), namely, behaviorism, cognitivism and constructivism.

Behaviorism is psychological theory that sees individual flow over the side of a physical phenomenon and emphasizes feedback and reinforcement. The mobile device can facilitate this when teachers and students use the devices together (Jacob and Isaac, 2008). Furthermore, Smith & Ragan (2005) states that in behaviorism, learning occurs when learners have proven to obtain proper strengthening of the relationship between a particular response and stimulus (Keskin & Metcalf, 2011). Added by Keskin & Metcalf that behaviorism mobile learning can be seen in the delivery of information and content such as test, practices, quizzes, listening-speaking practice, as well as drill and feedback: mobile response system content delivery by text messages. This can be done through mobile learning applications such as sms, mms, voice recorder mobile softwares and response system: qwizdom, turning point response system tell me tech. (Searching).

Cognitivism emphasis on concepts that are not observed, such as intellect, memory, attitude, motivation, thoughts, reflections, and other internal processes (Allesi & Trollip, 2001). The focus of mobile learning in terms Cognitivism is more on the delivery of information and content, such as the use of multimedia learning (text, video, audio, animation, images) SMS, MMS, e-Mail Podcasting Mobile TV (Keskin & Metcalf, 2011).

Constructivism holds that knowledge is emerged by the development of the concept and idea of the individual / learner current and past (Thus Spake et al., 2012; Keskin & Metcalf, 2011). Furthermore, Keskin & Metcalf (2011) states that constructivism focus on the adjustment or dependency context and content, explore cases and examples of problem-solving and decision-making applications, and represents a real context based information database through collaboration and interaction. Constructivism demands rich media resources, simulation and virtual environments (Jacob and Isaac, 2008). Learning simulation, visualization, and game environments can be provided through

mobile devices that can motivate the students to provide comfort and build knowledge. Application of constructivism in mobile learning can be done through simulation, handheld games, virtual reality, e-book / guidance, interactive podcasting and SMS, interactive mobile.

The three theories underlying learning mobile learning are of course only be effective when the learner and the teacher / instructor decides to involve themselves actively in the learning activities. The challenge is how to see the readiness of the user and the mobile device from the device application side, content and content providers to conform to the theory of learning.

Mobile learning challenges that have been outlined above implies the need for assessment of the readiness of the application system, the look and the content / content providers, skills, attitudes of users, and social interaction in learning theories include the meaningfulness of learning in the learning culture. This problem was formulated into three main aspects in line with the theory of Frame model (Koole, 2009), namely: technical aspects, user aspects and social aspects.

IV. FRAME MODEL OF MOBILE LEARNING

The Framework for the Rational Analysis of Mobile Education (FRAME) describes mobile learning as a process resulting from the convergence of mobile technology, the capacity of human learning, and social interaction (Koole, 2009). FRAME models in this article is used as a reference indicator of the readiness of the user identification, system applications and content to the mobile learning implementation and the development of vocational education in Indonesia which is based on a review of three aspects: technical aspects, user aspects and social aspects.

The technical aspect (device aspect) which is translated as the technical aspects in this article focuses on the physical and functional components of mobile devices, namely, through the media where learners can interact and provide physical and psychological comfort level of the learners (Kenny et al., 2009). According Koole (2009),

the physical components include input and output capabilities as well as internal processes for machines such as storage capability, the power, processor speed, compatibility, and expandability.

Aspects of the user (learner aspect) or translated as user aspects in this article is focused on the cognitive abilities of learners and prior knowledge to succeed in a particular context (Kenny et al., 2009). In addition to taking into account the cognitive abilities, previous knowledge, it is important to take into memory, knowledge transfer, learning by discovery, emotion, and motivation (Koole, 2009). This indicates some Learner aspect emphasis particularly on the transfer of knowledge and motivation, but according to the author prior to the transfer of knowledge, it should consider the possibility of cognitive abilities and motivations towards learning mobile learning. Cognitive ability and motivation will be greatly determined by tripartit attitude toward mobile learning, namely (a) cognitive components, which are the response perception and oral statements embodied by two convictions of ease of use and usefulness, (b) the affective component of the response of the sympathetic nervous and oral statements of feelings and soft emotion manifested in attitudes towards the user, and (c) component behavior which is implemented with the intention/desire to the user, (Fishbein & Ajzen, 1975; Davis et al., 1989) to mobile learning.

The social aspect (social aspect) refers to the process of social interaction and cooperation or collaboration (Koole, 2009). More broadly, Kearney et al. (2012) stated that this aspect referred primarily to improve collaboration, information access and more contextualization in learning. Social aspects in the frame of this model are important to provide an understanding of the socio-cultural pedagogy mobile related. According Trudge (1990) quoted from Kearney et al. (2012) stated that the collaboration in social and cultural theory was often stressed in terms of learning interaction with peers who were more capable or adults, and there was an emphasis pedagogical as a crutch.

Aside from these three aspects mentioned above, setting up mobile learning needs to consider the acceptability of the technology to understand the behavior or attitude of users in line with the results of research Nuraihan & Walid (2014) which recommended the need to understand and investigate further the important reception factors of mobile technology learning by students. Acceptance factors of this technology will be adapted to some key elements of the three aspects of the FRAME model.

V. USER ACCEPTANCE TECHNOLOGY OF MOBILE LEARNING

Several models have been developed to investigate and understand the factors that affect the acceptance of technology that can be used as a basis to see the factors in the acceptance of mobile technology as one of the future challenges of mobile learning. The use of the theories and models is based on the review of three aspects of mobile learning (Koole, 2009), namely: technical aspects (mobile device), aspects of the user (learner aspect) and social aspects (social aspect) which implies urgency factors that affect the acceptance of mobile technology learning, These three aspects are then linked to three types of theories and models of technology acceptance, namely: (1) theory of planned behavior/TPB) (Ajzen, 1991), (2) technology acceptance model/TAM) (Davis et al., 1989), (3) unified theory of acceptance and use of technology/UTAUT2 (Venkatesh et al., 2012).

Theories and models of technology acceptance above have been developed and used by some researchers in finding the factors of acceptance in mobile learning technology. Based on the study of theory and relevant research results, there are two critical factors which are identified to be the factors affecting user acceptance of mobile learning, namely, external factors and internal factors of the user manual. External factors derived from: (1) the junctions between the technical aspects and aspects of the user namely device usability focusing on ease perceived, (2) the junction between technical aspects and social aspects, namely social technology that focuses on usefulness

perceived, and (3) the intersection between user aspects and social aspects that interaction learning that focuses on social interaction and social technologies. The three aspects through the intersection on a frame of this model are associated with the technology acceptance model TAM and UTAUT2 to applying for external variables which are: the ease perceived (Liu et al., 2010; Maria, 2012; Cheon et al., 2012; Marrs, 2013; Tan et al., 2014), short-term and long-term use (Liu et al., 2010 & Maria, 2012), social influence (Motta et al., 2012 & Tan et al., 2014), and the condition of the facility (Motta et al., 2012). External variable is expected to affect the internal variable which derived from the model acceptance TBP and UTAUT2 namely the intention of use (Liu et al; Maria, 2012; Cheon et al., 2012; Marrs, 2013; Tan et al., 2014; Motta et al., 2012) and real use. In addition to these two factors, it is necessary to include the control variables which are sex (gender) and majors (department) adapted from Venkatesh et al. (2012) and Tan et al. (2014).

VI. CONCLUSION

The development of mobile technology has implications for modern learning known as mobile learning or learning using mobile media devices. Mobile learning in vocational education in Indonesia is not necessarily able to provide benefits for vocational learning due to still having some problems which are challenges for the development of mobile learning in Indonesia. The challenges are the acceptance of the technology of mobile devices for meaningful learning, learning theory underlying the utilization, readiness of school community, the ability of teachers, the challenge of physical and social factors as well as designs that have not been designed according to the education market and the absence of formal rules underlying the use of mobile learning in vocational education.

To face these challenges, some efforts to do are analyzing the technical aspects of the content, the user aspects of the attitudes and behavior, social aspects of the interaction collaborative learning so that mobile learning can be totally acceptable and appropriate for vocational education in Indonesia. Thus, the use of the paradigm of

learning theory behaviorism, cognitivism and constructivism to connecting the theory of Frame Model with the theory of technology acceptance (TPB, TAM and UTAUT2) is a real effort to do as a reference of implementation and development of mobile learning in vocational education in Indonesia.

REFERENCES

- Ajzen, I. (1991). The Theory of Planned Behavior. *Organizational Behavior and Human Decision Processes*, 50, 179-211
- Alessi, S.M., & Trollip, S.R. (2001). *Multimedia for Learning: Methods and Development (3th ed.)*. Boston: Allyn and Bacon
- Ahmadi, C., dkk. (2010, Juni). Moodle-based mobile learning applications and MLE on medicine learning. *National Seminar on Information Technology Application, Yogyakarta*, 30-34
- Brown, T. H. (2003, Juni). *The Role of M-Learning in the future of e-learning in Africa?*. Presentation at 21st ICDE World Conference, Hongkong
- Cheon, J., et.al, (2012). An investigation of mobile learning readiness in higher education based on the theory of planned behavior. *Computers & Education*, 59, 3, 1054-1064
- Campanella, P. (2012). Mobile Learning: New forms of education. *10thIEEE International Conference on Emerging elearning Technologies and Application*, 51-56.
- Davis, F.D., et.al, (1989). User Acceptance of Computer Technology: A Comparison of Two Theoretical Models. *MIS Quarterly*, 35, 8, 982-1003.
- Djojonegoro, Wardiman. (1998). *Pengembangan Sumber Daya Manusia: Melalui Sekolah Menengah Kejuruan*. Jakarta: Depdikbud
- Georgieva, E. S., Smrikarov, A. S., & Georgiev, T. S. (2011). Evaluation of Mobile Learning System [Versi elektronik]. *Procedia Computer Science*, 3, 632-637.
- Gikas, J. & Grant, M.M. (2013). Mobile computing devices in higher education: Student perspectives on learning with cellphones, smartphones & social media

- [Versi elektronik]. *The Internet and Higher Education*, 19,18–26.
- Hashemi, M., et.al, (2011). What is Mobile Learning? Challenges and Capabilities [Versi elektronik]. *Procedia-Social and Behavioral Sciences*, 30, 2477–2481
- Jabbour, K.K. (2013). An analysis of the effect of mobile learning on lebanese higher education [Versi elektronik]. *Bulgarian Journal of Science and Education Policy (BJSEP)*, 7, 2, 280-302
- Koole, M.L. (2009). A Model for Framing Mobile Learning (pp. 25-50). In M. Ali (Eds.), *Mobile Learning: Transforming the Delivery of Education and Training* (pp. 25-50). Canada: AU Press.
- Keskin, N.O., & Metcalf, D. (2011). The Current Perspectives, Theories and Practices of Mobile Learning [Versi elektronik]. *The Turkish Online Journal of Educational Technology*, 10, 2, 202-208
- Kenny et al. (2009). Mobile Learning in Nursing Practice Education: Applying Koole's FRAME Model [Versi elektronik]. *Journal of Distance Education Revue De L'éducation À Distance*, 23, 3, 75-96
- Kearney et al. (2012). Viewing Mobile Learning from a Pedagogical Perspective [Versi elektronik]. *Research in Learning Technology*, 20, 1-17
- Liu, Y., Li, H. & Carlsson, C. (2010). Factors driving the adoption of m-learning: An Empirical Study [Versi elektronik]. *Computers & Education*, 55, 3, 1211–1219
- Maria, et.al, (2012). Intention to use m-learning in higher education settings [Versi elektronik]. *2012XXXVI Encontro da Anpad*, 1-16
- Marrs, K. (2013). *An Investigation of the Factors that Influence Faculty and Student Acceptance of Mobile Learning in Online Higher Education* [Versi elektronik]. Dissertation, Graduate School of Computer and Information Sciences Nova Southeastern University
- Motta, E., Cattaneo, A., & Gurtner, J.-L. (2013). Mobile Devices to Bridge the Gap in VET: Ease of Use and Usefulness as Indicators for Their Acceptance [Versi elektronik]. *Journal of Education and Training Studies*, 2(1), 165–179.
- Naismith, L., et.al, (2004). *Literature review in mobile technologies and learning*. Bristol: Futurelab.
- Nuraihan, E., Ibrahim, M. & Walid, N. (2014). Trust contributing factors in m-learning technology [Versi elektronik]. *Procedia-Social and Behavioral Sciences*, 129, 554-561
- Peters, K. (2007). M-learning: positioning educators for a mobile, connected future [Versi elektronik]. *International Review of Research in Open and Distance Learning*, 8, 2,1492-3831
- Pachler, N., Bachmair, B., & Cook, J. (2010). *Mobile Learning: Structures, Agency, Practices*. London: Springer
- Sukamto. (1988). *Perencanaan dan Pengembangan Kurikulum Pendidikan Teknologi dan Kejuruan*. Jakarta: Depdikbud-P2LPTK
- Sudira, Putu. (2012). *Filosofi dan Teori Pendidikan Vokasi dan Kejuruan*. Yogyakarta: UNY Press.
- Sarrab, M., Al-shihi, H. & Rehman, O.M.H. (2013). Exploring Major Challenges and Benefits of M-learning Adoption [Versi elektronik]. *British Journal of Applied Science & Technology*, 3, 4, 826–839.
- Thüs, H., et.al, (2012). Mobile Learning in Context [Versi elektronik], *International Journal of Technology Enhanced Learning*, 4,5,6.332-344
- Tan, G.W.-H., et.al, (2014). Predicting the Drivers of Behavioral Intention to Use Mobile Learning: a Hybrid Sem-Neural Networks Approach [Versi elektronik]. *Computers in Human Behavior*, 36, 198–213
- Venkatesh, V., et.al, (2012). Consumer Acceptance and Use of Information Technology: Extending the Unified Theory of Acceptance and Use of Technology [Versi elektronik]. *MIS Quarterly*, 36,1, 157-178
- Wagner, T. (2008). *The Global Achievement Gap*. New York: Basic Books.
- Zarini, M., et.al, (2009). Overview: The growing role of TCTs in education and training. Dalam Maclean, R. & Wilson, D. (Eds.), *International Handbook of Education for the Changing World of Work* (pp. 1835-1846). London: Springer Science+Business Media B.V.

THE EMPOWERMENT OF VOCATIONAL EDUCATION AND ITS CONTRIBUTION TO NATIONAL ECONOMIC GROWTH AND WORKFORCE

Sutarto Hp

Faculty of Engineering, Yogyakarta State University
email: sutartohp19@gmail.com

ABSTRACT

Senior Vocational High Schools (SMKs) are middle schools that prepare their graduates for working in certain field of work. However, Central Bureau of Statistic's report shows that unemployment index of SMK graduate (9.05%) was higher than General High School's (SMA's) one (8.17%). This phenomenon may be caused by two main reasons: (1) SMK graduates do not have competence as needed by industry and business players; (2) industry and business players do not need additional workers. The later cause was hypothesized as an impact of national economic declining. Human Capital theory (Becker, 1993) premises that education and training will elevate thinking, applying, and attitude skills. In the vocational education context, education and training will elevate graduates' work productivity. It will be true when educational planning and its execution done in proper manner. If not, then human capital theory will not be approved and education will not elevate graduates' competences and the graduates will be rejected by industry and market. It also will not contribute to national economic growth. Vocational education is not only government responsibility, but also become collective responsibility of three parties (*tripartite*): government, business world/community, and school. The role of tripartite need to be optimized to support the effectiveness of SMK to result the graduates who possess competences match market needs. This paper will assess and analyze tripartite role to result SMK's graduates who possess competence matched labor market requirement both in national and ASEAN regional scopes.

Keywords: *empowerment, vocational education, economic, workforce*

I. INTRODUCTION

Constitution of National Education System, Article 15, states that vocational education is a middle education level that prepares their graduates mainly for working in a certain occupation. However, Statistic Central Bureau (BPS, 2015) reports that unemployment index of SMK graduate was higher than General High School's (SMA's) one, which is 9.05% to 8.17%. This phenomenon may be driven by two main causes: (1) SMK graduates do not have competence as needed by industry and business players; (2) industry and business players do not need additional workers. The second cause may be associated with the declining of national economic condition.

To respond the phenomenon above, vocational education, especially SMKs, need the be empowered so that their graduates will possess competences that match the labor market need as well as graduates' need to develop their talent and interest through further education and training even to be success in pioneering youth entrepreneurs.

To achieve the graduate competences above is not easy process. Many challenges are obvious; mainly low commitment and weak roles of government, business and industry, and school (*tripartite*) in executing vocational education. In addition, perceptions of young people towards vocational education is not yet as good as compared to their perceptions toward public school.

The purpose of this paper is to identify some policy recommendations relevant to stakeholders: especially central and local government, people in business and industry, formal and non-formal vocational institutions, youths, parents, and community.

II. METHOD

This paper will describe and synthesize relevant theories and research findings to main issues how to empower vocational education to results graduates' competences as mentioned in purpose of study above.

III. DESCRIPTION AND DISCUSSION

Issues need to be described and discussed to provide alternative ways in empowering vocational schools. Those issues, especially are philosophy upheld, curriculum development and its implementation, school-business/industry relationship, and policies and economical impact (national and local).

3.1. Philosophy upheld

Wonacott (2003) explains that there are two main philosophies upheld, especially in United States, in the development of vocational education. First philosophy is “*social efficiency*” promoted by Snedden and his student Prosser. They advocated that vocational education was to prepare students to possess knowledge, skills, and attitude to fulfill the business and industry needs. Vocational student graduates would work effectively and efficiently to accomplish their task as expected by business and industry. This philosophy is known as *social efficiency theory*.

Snedden (1910) divided vocational education into five areas which individuals were prepared: (1) Professional education prepared lawyers, physicians, engineers, teachers, clergy, and military personnel; (2) Commercial education prepared book-keepers, clerks, stenographers, commercial travelers, and business leaders; (3) Industrial education prepared bricklayers, machinists, shoemakers, metal workers, factory hands, and others in higher manufacturing pursuits; (4) Agricultural education provided skill and knowledge looking to the tillage of the soil and the management of domestic animals; (5) Education in the household arts prepared girls for dressmaking, cooking, and management of the home.

Furthermore, Snedden divided vocational education into two categories: higher vocational education and vocational training. The first category was a part of higher education and intended for students who had completed secondary and, in some cases, undergraduate education. While the second one was included commercial, industrial, and agricultural education and education in the household arts and was

“adapted to persons of average capacity” at three different levels: elementary vocational training for those under 15 years old; secondary vocational training for those 15 to 18/19 years old; and higher vocational training.

The second philosophy is “social democracy” voiced by Dewey. It viewed “vocation in the broadest sense to include not only an occupation by which one earns a living but also any occupation that is a continuous activity having a purpose” (Dewey, 1916: 309). According to Dewey, vocational includes life roles such as family member, friend, and citizen; to Dewey, everyone had multiple occupations, reflecting the multiple, continuous, purposeful activities in everyone’s life.

Dewey (1910, 360-62) then made three points. First, an occupation is the only thing which balances the distinctive capacity of an individual with his social service. In other words, only *through* an occupation can an individual attain both personal development and social efficiency. Second, education *through* occupations consequently combines within itself more of the factors conducive to learning than any other method. In Dewey’s view, only an occupation provided the context for learning in which the activity and process of growing—rather than the external product of the end state of finished growth—was the aim, fulfilling Dewey’s requirements for aims, interests and discipline, experience and thinking, and play and work. Third, the adequate training *for* occupations is training *through* occupations. Dewey specifically warned against narrow *vocational training* that was likely to perpetuate inequitable social divisions and conditions; rather, he argued in favor of a broader *vocational education* which provided individuals with the intellectual knowledge and skills needed to master not only a wage-earning occupation but also all the other occupations of their lives.

Ideally, vocational education including in Indonesia, should articulate both of those two philosophies above. The graduates ought to possess competences for working (wage-earning) as well as for developing

their lives in-line with their talent and interest including to be prospective young entrepreneur. This articulation should be accommodated in vocational education curriculum in the following subsection.

3.2. Curriculum and Its Implementation

In the context of SMK curriculum in Indonesia called *Kurikulum 2013 (K-13)* apparently has accommodated the two philosophies: social efficiency and social democracy as respectively advocated by Prosser and Dewey. Education and Culture Ministry Regulation (Permendikbud) number 70 year 2013 describes that curriculum structure of K-13 for vocational school consist of two group courses: core and elective (*peminatan*). The core courses, in terms of subject matter and credit hours, is the same both for general/academic school (SMA) and for vocational school (SMK). The elective courses for SMA covers academic only, while for SMK covers academic (same as SMA) and vocational interest courses. As a result, the total number of credit hours for 3 years SMK students is higher than those for 3 years SMA students. The credit hour comparison between SMK to SMA tracks is 144 to 130.

By concept, the curriculum articulation in K-13 above is a good strategy to treat vocational students as democratically as the treatment to those of academic ones. By having K-13, SMK is not a dead end as viewed by part of society. Under K-13, after completing study, SMK graduates have choices: (1) working (*bekerja*) in business-industry; (2) continuing (*melanjutkan*) to higher education same as SMA graduates are assigned to do; and (3) being entrepreneur (*wirusaha*). Those words of *bekerja*, *melanjutkan*, and *wirusaha* commonly abbreviated as BMW for easily memorized as a well-known Germany car brand.

In practice, K-13 implementation, especially at the beginning phase, it will faces at least three challenges. First, SMK students will be overburden of credit hours. Second, for now, SMK student intake generally from middle class social economic status that also generally possess lower motivation and self-actualization. Third, SMK's parent aspiration to their children's success in their career is

usually not as high as of those from academic school (SMA) parents.

A tentative solution for those challenges is to extend the duration of school years of SMK from three (3) to four (4) years. By doing this, SMK graduates will master both academic and vocational competence in terms of scope and quality. In broad sense, K-13 for SMK has accommodated both social efficiency and social democracy philosophies.

In term of future skills needed by business and industry as well as individual graduates to develop their professional career, some studies had reported the findings. Some studies, e.g., 21 century skills done by ACTE & CTE (2010) identify 10 skills needed by an individual to work successfully in 21 century. They are: (1) Critical Thinking and Problem Solving; (2) Communication and Collaboration; (3) Information Literacy; (4) Media Literacy; (5) Information, Communications and Technology (ICT) Literacy; (6) Flexibility and Adaptability; (7) Initiative and Self-Direction; (8) Social And Cross-Cultural Skills; (9) Productivity and Accountability; and (10) Leadership and Responsibility.

It seems that K-13 has also articulated those 21 century skills. It is indicated by advocating the use of scientific approach in teaching-learning process. It consists of five phases of "M" called 5M: *Mengamati* (observing); *Menanya* (questioning); *Mengumpulkan* informasi (collecting information); *Mengasosiasi/ Menalar* (Correlating/Reasoning); and *Mengomunikasikan* (communicating). Methods representing scientific approach might be discovery learning, project-based learning, problem-based learning, inquiry learning. In scientific approach the teacher facilitates students to master learning topic through those 5M.

Accompanying the use of scientific approach, Permendikbud number 103 year 2014 suggests shifting the existing teaching-learning principles to new ones. Those main teaching-learning principles: (1) students are facilitated to know; (2) students learn from variety of learning sources; (3) conducted by scientific approach; (4) towards competence-based; (5) emphasizes

on multiple dimensions of right answers : (6) application skills; (7) hard and soft skills balanced; (8) utilizing information and communication technology (ICT) to elevate teaching-learning quality efficiently and effectively; and (9) joy full and challenging teaching-learning climate.

Conceptually, as an innovation policy, K-13 gives a hope to empower vocational schools, however a good curriculum cannot guarantee resulting good graduates. First thing needs to consider is teachers' response to the innovation. Research findings in State Senior Technical High Schools (SMKs) in Yogyakarta City done by Sutarto (2015) reveal that the response of Building Technical Drawing teachers to the nine principles K-13 in teaching-learning as previously described was just about good or "not quite good yet".

This response degree is not adequate enough to support K-13 implementation. This low degree teacher response is a natural phenomenon of an innovation. People tend to reject an innovation because it will disturb their establishment. In other word, people tend to be in status quo position and enjoy them. They do not need to study or to adjust their habits or custom that is not enjoyable. Tuckman (1965) in his book entitled: "Developmental sequence in small groups" classified four phases to illustrate the relation between people psychological condition and their work performance. Those phases are "storming" (S) represents conflicting individual values and innovation (new) values; "adjusting" (A) represents adjustment of individual values to new values; "norming" (N) represents normal situation that individual starts feeling joy; and "performing" (P) represents that employee perform well in his/her work because his/her values has accustomed to new innovation values.

Time period needed by each phase above depended on external and internal individual factors. External factor, in K-13 implementation case, mainly government support and facilitation to the teachers, such as for example workshop, training, IHT, and seminar. For internal factor, individual teacher needs to learn K-13 in group or individually, e.g., searching relevant material

on K-13 through internet. The more intensive internal and external factors, the shorter time phase period for an employee to perform in his/her work

Second concern is teacher competence. It is a primary determinant to successfully implement a curriculum and result expected graduate competences. Research done by Jaedun (2014) indicated that the competence of Building Technical Drawing teachers of State Senior Technical High School (SMKN) in Yogyakarta Special Region "were not quite competence" to implement K-13. Furthermore, similar studies done by Hartoyo (2015) within the population of State and Private SMKs Yogyakarta Special Region and Sutarto (2015) with the population of Yogyakarta City indicated that teacher competence was "moderate adequate" to implement K-13. This teacher competence level is higher that Jaedun's research finding (was not quite adequate). It means that teacher competence level had increased from 2014 to 2015. It was reasonable, because during 2014-2015 period Government had empowered vocational teachers to implement K-13 by providing e.g., training, workshop, in house training, supplying teacher and students with textbooks. In addition, most teachers did individual effort to empower themselves.

3.3. School and Business-Industry Relationship

As mentioned previously, SMK graduates are mainly prepared to work in a certain occupation and considering Prosser's social efficiency theory, therefore school-business relation is very important. Vocational schools are to be proactive building their relationship with business and industry. The role of business-industry for vocational schools is very vital. First, business and industry should identify their needs and share them with the schools. Second, business and industry should participate or facilitate vocational student learning process. Third, through their relevant association evaluate the student competences especially at the end of school level year.

The process of identifying and sharing business and industry needs with vocational

schools should be conducted in regular time-bound, say 3-5 year, may be in form of workshop, seminar, IHT and the likes. This forum should result with school curriculum modification or even curriculum changing.

Business and industry participation in student-learning process can be done in variety of forms: (1) provide opportunities to vocational students and also the teacher to have industrial learning experiences; (2) send their instructors to vocational schools as visitor teachers; (3) conduct a collaborative team to accomplish certain projects that benefit for school as well as for business and industry. These participations can be accounted as a part of their corporate social responsibility (CSR).

School-Business and industry relationship needs to be formulated in win-win solution. By having the partnership, school, especially students, will have benefit that students would be exposed to the real competence needed by business and industry. Students are also exposed in the real work culture, e.g., time appreciation, team work, and safety of work.

On the other side, business and industry would also get benefit. They would have employee candidates who possess competences match with their needs. However, the most motivation for business and industry is financial benefit. On this case, the role of government is needed. Government both national and local together with House of People Representative (DPR) should formulate regulations to support that concern. For example, for business and industry that provide training to vocational students, they will get financial compensation, such as deductible tax, block grant, or other forms of reimbursement born for schools.

3.4. Government Policy

National policy to increase the number of vocation school students up to 67% had been written in the Strategic Plan of Education Ministry 2005-2009 and 2010-2014. Education Ministry (at that time) plan the ratio between vocational school to general school students become 60 to 40 at the end of 2014. However, this target nationally was not accomplished. Now, in the

new Education and Culture Minister, Muhadjir Efendy, the policy of increasing vocational students number is continued accompanied by increasing quality of vocational program.

Increasing the number of vocational students is relatively easy. It can be done, such as by building new classrooms, establishing new vocational schools, converting general schools to vocational ones. But, increasing vocational school quality is not easy way. Good vocational schools need good equipment and facilities, teachers with relevant field experience, and good partnership with business and industry who are willing to accommodate and provide industrial experiences for vocational students and teachers. All of those mentioned need amount of budget that is mostly difficult thing.

Furthermore, the challenge is how to have high number of vocational students with possess adequate competences as needed by business and industry. In other word, how to design type and number of vocational study programs that match business and industry needs or labor market. To achieve those objective above, vocational schools has to build a partnership with business and industry. National and Local Government should take leadership in this issues, especially pursuing business and industry attention and involvement in vocational teaching and learning programs. .

Government and school side should know business and industry mind set. Most business and industry have different orientation compared to vocational schools one. Business and industry orient to financial profit, while schools orient to non-financial profit that provide graduates with expected competencies. Therefore, government policy is very vital. It should become a bridge to connect or match business and school orientations. Again the policy should be win-win orientation.

One reference need to be learned, not to be adopted, is Germany policy in Dual System. Trembly and Le Bot (2003: 12) explained that vocational training in Germany is institutionalized procedures and based on tripartite agreement: public authorities, employers' organizations and

trade unions. In regard to funding, the costs of school-based training are assumed by the state and the costs of practical training are assumed by firms that provide the apprenticeship places and take in trainees.

3.5. Vocational Education Contribution to National Economy Growth

Human Capital theory (Becker, 1993) premises that education and training will elevate thinking, applying, and attitude skills. In vocational education context, education and training will elevate graduates' work productivity. This theory will be true when educational planning and its execution done in proper manner. If not, then human capital theory will not be approved and education

will not elevate graduates' competences. The graduates will become unproductive workers or even become unemployment.

Many research finding have approved that vocational education contribute national economic growth. Asian Development Bank. (2008) stated that "empirical results confirming the important role of vocational school (SMK) in supporting regional economic growth in Indonesia". This study mentions common problems rose to the vocational training sector in many countries. The problems are (1) missing link with the economy; (2) employers do not interest in providing traineeship; and (3) the fragmentation of vocational training.



Fig.1 National Training System that link between KKNi and SKKNI.

In the context of Indonesia, problem number 1) is quite true. There is no nationwide publication (blue print) that enounced the relation between national program (long- and mid-term) in relation with man power planning, including what study program and its specialization needed. It seems happened in national and local government.

For problem number 2)-employers do not interest in providing traineeship. It is also currently happened in Indonesia. The

reason, there is no clear policy or regulation that provide incentive, especially in financial form. When Business and industry build partnership with vocational schools, the training program is mostly based on industry interest. They provide vocational training with objective to enlarge their networking in marketing their product. This training heavily follow social efficiency theory. It is fine for now, but in the future government with tripartite need to organize this training program to make balance between social

efficiency and social democracy. Budget sharing among the tripartite to support this training program is essential to be formulated.

Problem number 3, the fragmentation of vocational training. Practically, it is also true in Indonesia. However, by concept there are policies trying to minimize this problem. President Regulation number 8 year 2012 on National Education Qualification Framework in Indonesia abbreviated as KKNi has classified educational qualification into nine ranks representing the completion of: (1) basic education or grade 9; (2) senior high school; (3) Diploma 1; (4) Diploma2; (5) Diploma 3; (6) Diploma 4/S1; (7) Profession; (8) S2-Magister; (9) S3-Specialist. On the side of workforce sector, Workforce and Transmigration Ministry has enacted Regulation number 5 year 2012 on National Work Competence Standardization System abbreviated as SKKNI that provides national and regional training system. There is a link between the two regulations (education and workforce sectors) as illustrated in Fig. 1. However, this national training system needs to be organized in real field practice. It needs to be socialized to business and industry and labor union representations so that it will be effectively implemented.

IV. CONCLUSION

Based on the discussion above, following some conclusions as well as recommendations.

First, vocational curriculum development has to be formulated based on social efficiency as well as social democracy. Graduates will possess competences relevant to business and industry needs as well as to develop their career in line with their talent and interest.

Second, capacity building for vocational teachers is a must, because they are the main players in curriculum implementation. A good curriculum will not guarantee to result graduates who possess good competences.

Third, Government needs to organize the role of tripartite (government, business and industry, and labor union) in a national training system to bear workforce quality to lead the growth of national economy.

V. REFERENCES

- Asian Development Bank. (2008). *Good Practice in Technical and Vocational Education and Training*. Manila, Philipina: ADB Pub.
- Career and Technical Education (2013). *21st Century Skills Employability*. Washington D.C.: CTE Pub.
- Depdikbud (2013). *Peraturan Menteri Pendidikan dan Kebudayaan Nomer 81 A Tahun 2013 tentang Implementas Kurikulum dan Pedoman Evaluasidan Kurikulum*. Jakarta: Amir Samsudin.
- Depdikbud (2013). *Peraturan Menteri Pendidikan dan Kebudayaan Nomer 70 Tahun 2013 tentang Kerangka Dasar dan Struktur Kurikulum Sekolah Menengah Kejuruan/ Madrasah Aliah Kejuruan*. Jakarta: Amir Samsudin.
- Depdikbud (2014). *Peraturan Menteri Pendidikan dan Kebudayaan Nomer 103 tahun 2013 tentang Pembelajaran pada Pendidikan Dasar dan Pendidikan Menengah*. Jakarta: Ani Nurdiani Azizah, Karo Hukum dan Organisasi
- Depnaker (2008). *Pedoman Penyelenggaraan Sistem Pelatihan Kerja Nasional Di Daerah*. Jakarta: Sekjen Depnaker. P
- Dewey J. (1916). *Democrecy and Education: An Introduction of the Philosophy of Education*. Los Angeles: IndoEuropean Pub. reprinted 2012.
- Eichhorst W. et al. (2012). *A Roadmap to Vocational Education and Training Systems Around the World*. Bonn, Germany: IZA DP No. 7110 Publication.
- Hartoyo (2015). *Kesiapan guru SMK di Kota Yogyakarta dalam mengimplementasikan Kurikulum 2013*. Yogyakarta: Press IKA UNY.
- Jaedun dkk. (2014). *Kesiapan guru smk program keahlian teknik bangunan di daerah istimewa yogyakarta dalam mengimplementasikan Kurikulum 2013*. Yogyakarta: FT UNY (Laporan Penelitian tidak diterbitkan).

- Ministry of Education (2005). *Renstra Kementerian Pendidikan Nasional 2005-2009*. Jakarta: Depdikbud Pub.
- Ministry of Education (2010). *Renstra Kementerian Pendidikan Nasional 2010-2014*. Jakarta: Depdikbud Pub.
- Republic of Indonesia. *Lampiran Peraturan Menteri Pendidikan dan Kebudayaan Nomor 70 tahun 2013 tentang Kerangka Dasar dan Struktur Kurikulum Sekolah Menengah Kejuruan/Madrasah Aliyah Kejuruan*. Jakarta: Menhumkam.
- Republika. (2014). *Mendikbud jelaskan kurikulum 2013 di London*. <http://www.republika.co.id/21.01.2004>.
- Snedden, D. (1910). *The Problem of Vocational Education*. Boston, MA: Houghton Mifflin, 1910, pp. iii-iv.
- Statistic Central Bureau. (2015). BPS reports. Jakarta: BPS Pub.
- Streeck.W. et al. (1987). *The role of the social partners in vocational training and further training in the Federal Republic of Germany*. Berlin: ECDVT Pub.
- Tuckman B. (1965). "Developmental sequence in small groups". *Psychological Bulletin* 63 (6): 384-399.

STRENGTHENING COMMUNITY COLLEGE TO IMPROVE GROSS ENROLMENT RATIO (GER) OF HIGHER EDUCATION

Sunaryo Soenarto
email: sunaryos@uny.ac.id

ABSTRACT

At the outset, in 2012, College Community began to be developed (Community College) through a program of study outside of domicile with a number of 35 Community College in the city/county in Indonesia. Act No. 12 of 2012 on of Higher Education provides legal certainty on the form and structure of College Community institutions. Long Term Development Plan for Higher Education, in 2025, will be built 255 Community College, in all regions in Indonesia. Meanwhile, until 2013, the gross enrollment rate (GER) from college (PT) has reached 29.9 percent and the government expects that number to increase to 40 percent in 2025. Community college offers vocational education programs diploma level one and level two diploma, with a special branch of science, science and technology based on the specific local advantages and meet special needs. Community college with vocational education programs at the level of skilled manpower which is relatively short, expected to motivate high school graduates and the community to be higher education alternatives.

Keywords: community college, gross enrollment rate, vocational education, higher education

I. INTRODUCTION

The influence of regional policy ASEAN Economic Community (AEC) which provide ample opportunities for foreign workers (ASEAN) to enter Indonesia, will affect a very tight competition and can not be avoided. Competition or expertise become major benchmarks for workers in taking employment among workers in ASEAN Countries. for workers who have high competence, will have a greater opportunity to get a job and sufficient economic benefit. To create skilled workers, which has a high competence, productive, innovative and professional,, then the world of education (especially universities) has a responsibility in improving the quality of human resources (HR) of Indonesia in order to compete with workers from ASEAN Countries, because without qualified human resources can be sure that the local labor force would lose out in competition with workers force of the ASEAN Countries.

Human resources productive, and innovative is the driver of economic growth in Indonesia. To generate employment, productive applicable, it requires a quality education, and relevant to the development needs of the District / Municipal (local). In an era of economic shift towards knowledge-based economy and technology, the role of

higher education is very important, among others, to produce a workers that is superior, and productive, which is becoming able to apply science and technology needed, in order to increase the value added of sustainable economic activities.

Indicators of Performance Strategic Objectives of the Ministry of Education and Culture in 2010-2014, higher education APK targeted 40%, but the realization only reached 29.15%. Regulation of the Minister of Research, Technology and Higher Education of the Republic of Indonesia, No. 13 of 2015 on the Strategic Plan of the Ministry of Research, Technology and Higher Education Years 2015-2019 explicitly set out five Strategic Goals and Strategic Objectives Performance Indicators. One of the five strategic objectives is to improve the quality of learning, higher education and student affairs. One of the eight Performance Indicators Strategic Objective is to increase the Gross Enrolment Ratio (GER). How is the strategy of Kemenristekdikti able to boost APK college in the Strategic Plan of the Ministry of Research, Technology and Higher Education Years 2015-2019 is a serious concern of the university academicians who attended the seminar ICVET 2016.

II. RESULT AND DISCUSSION

2.1. Gross Enrollment Rate (GER)

Minister of Research, Technology and Higher Education Mohamad Nasir in the event of Reflection 1 Year Ministry of Research, Technology and Higher Education said that in 2015, various targets launched by Kemenristekdikti been achieved. One of them is the Gross Enrolment Ratio (GER) College in 2015 by 33.5 percent, above the initial target of the year, amounting to 26.8 percent.¹⁾ Achievement APK college in 2015, still lower than the announced target of 35 percent, *Republika* newspaper quoted the Minister of Education and Culture (Education) Muhammad Nuh, explained in 2015 the gross enrollment rate (GER) education targeted to reach 35 percent. In 2013, APK higher education has only reached 29 percent. While in 2014, APK higher education is expected to reach 30 percent. This number is up 12 percent in the last four years. Earlier, the GER in 2009 only amounted to 18 percent.²⁾ APK developed countries have reached 40 percent. Target and Achievement GER of Higher Education Ministry of Education and Culture in 2010-2014 can be presented following radar diagram.

APK from College of the course needs to be improved. Various efforts and breakthroughs continue to be developed Kemenristekdikti to increase GER in higher education in Indonesia. Various strategies Kemenristekdikti has been rolled out, ranging from the provision of scholarships

for students from poor families to continue their education in college (scholarships Bidikmisi, Scholarship PPA / BBM), granting scholarships Affirmations for students who come from areas forefront, outermost and underdeveloped (3T), BOPTN Fair, to encourage the birth of the Academy community in each district / city in Indonesia. It is intended to open wider access for the public to acquire a higher education.

Therefore, the central government and local governments in synergy to encourage programs to develop human resources oriented to excellence, and the potential of regional corridors through Community Academy education. In the Strategic Plan for 2010-2014 Kemendikbud explicitly stated activities to increase access to higher education by the establishment of new colleges, nationalization of private universities, as well as the establishment of the Community Academy. But in RPJMN years 2015-2019, the direction of policy related to the higher education of the improvement programs and equitable access to higher education through a strategy of increasing capacity and equitable access to Higher Education is not explicitly linked to the establishment of the Community Academy. Thus in two periods of higher education policy there has been a reduction in the strategic program to interpret Community Academy (AK).

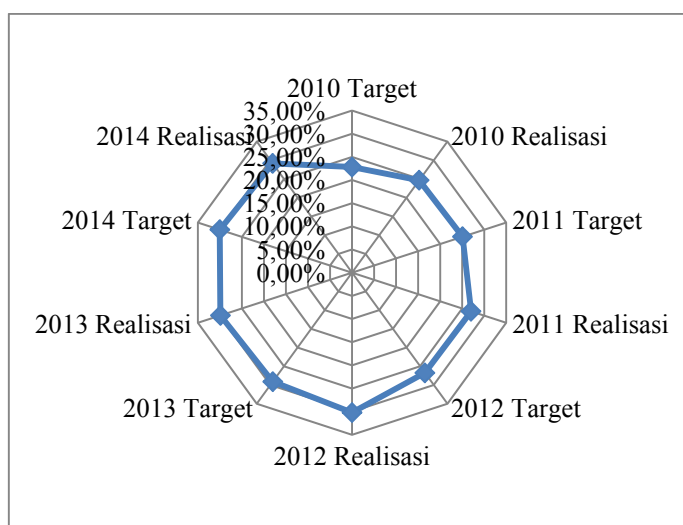


Fig. 1. Target dan Realization of APK in Higher Education Year 2010-2014.³⁾

2.2. Community College

Community College is the place to gain valuable knowledge (knowledge, technical skills and vocational) needed by society and employers (Emeagwali, 2007) ⁴⁾ Understanding the broader submitted by Jacobs and Grubb (2003) ⁵⁾, that the Community College is college place to form the basic skills, vocational and produce skilled workers. Community College in the United States known as " two-years-college " or "Junior College", to serve the community near the highways and public transport route, so that students can reach campus easily. Programs offered include: transfer-to-universities program, technical programs, job training programs, basic skills program, and program special interests.

Malaysia has developed a Community College since 2001, with the main objective to provide alternative skills training and education for high school graduates, and for citizens who have left the formal education system. The purpose of the College is to provide certificates and diplomas to students (academically) who may not be able to compete for entry into local universities, or for those who have failed to get a higher education institution. Community College offers a program that emphasizes hands-on and practical in the community. The ratio of lectures on theoretical subjects compared to the practice is 75%: 25%. Some courses at Community College Malaysia include: automotive technicians, electricians, computer technicians, catering, fashion, food processing and quality control. In the structure of the Ministry of Higher Education in Malaysia, Community College Title Assessment coordinated by the Polytechnic and Community College. Ministry of Research Technology and Higher Education (KemenRistekDikti) need to learn to Malaysia in developing Community College. Within fifteen years, there are 115 Community College is in the building by public universities. Even 115 Community College has been accredited by the Public Service Department (PSD) / Position Perkhidmatan Awam (JPA).⁶⁾

Indonesia has the potential socio-economic, and abundant natural resources but has not been used optimally. This is

partly due to limited resources, both human and technological resources. In Blueprint Community Academy (2013) gives the pressure, the role of skills-oriented education (vocational) becomes important, and strategic optimization of ability to leverage the potential of human resources in each area. Policies of the Directorate General of Higher Education, Ministry of Education and Culture, at the time, strengthen and realize the availability of Indonesian higher education quality and relevant to the needs of national development are: a) to develop vocational education short term (D-I and D-II) oriented employment; and b) expand and increase the Gross Enrolment Ratio (GER) in higher education. Law No. 12 of 2012 on Higher Education has determined unequivocally the presence of one form of college is a community college (AK). Conceptually, the purpose of community college are: (a) a place of education and training to provide alternative route for vocational schools (SMK) and graduated from high school (SMA), (b) the place of education and training to provide knowledge of lifelong learning to the community (community learning), and (c) to provide training and up skilling and re-skilling for the manpower needs of local (regional), and (d) provide strategic network for strengthening social activities.

Law No. 12 of 2012 on Higher Education, Article 56, paragraph 7 of the Higher Education Act No. 12 of 2012, explaining that the form of the college consists of: universities, institutes, colleges, polytechnics, colleges, and community colleges. Article 59 (7) confirmed that the community college (Community College) is a form college which runs a program of vocational education diploma level one (D1) and a diploma two (D2), with a specialty in the branch of science, science and technology, specific local excellence and meet special needs. Establishment of the community college education based on the characteristics of a community and economic potential of the region according to the corridors of each district / city and province. The establishment and management of community college can be held either at the initiative of pure district / municipal

governments as well as by industries operating in the area. Furthermore, Article 81, paragraph 1 confirms that the Government together with Local Government gradually developing at least 1 (one) community college in the appropriate fields with excellent potential in the area of the district / city and / or in the border area.

Community Academy curriculum was developed in synergy between the academic community in industrialized societies, and professional organizations. Community Academy graduates product is ready for use as a principal activity at the center of economic growth in each economic corridor. As a provider of professional personnel in accordance potential of the region, then its presence in every city / district throughout Indonesia should be the primary consideration. Community Academy curriculum refers to or aligned with the curriculum of vocational higher education. The curriculum defines each stage is held on an annual basis by having a specific competence achievement. These achievements referring to the graduate program profile in the world of work or industry based on local seed each region. The basic framework and structure of the Community Academy curriculum for each education program developed by universities, related industries and stakeholders, with reference to Presidential Decree No. 8 of 2012 on KKN. Community Academy curriculum has a primary structure consisting of three competencies: (a) general competence, (b) competency skills, and (c) a special competence. In the group of general competency-based courses students are expected to have the ability to communicate both in Indonesian and foreign languages, in at least one foreign language. The ability to utilize the information and technology base became an important part as a device to explore and expand scientific knowledge. Thus, students are expected to be able to access as much information and knowledge related to his chosen field and were able to compile it. The practice is intended for all sake of learning conducted via the Internet.

2.3. Potencies of Present Community College

Prediction of the establishment of the Academy of Communities across Indonesia by 2015 as many as 269 community colleges, as visualized in Figure 1 below. Prediction is developed with the assumption that each college Polytechnic to develop a program of study at the College of Foreign Domicile. Implementation of Community Academy under the guidance of (the college center) through Program Out of Domicile (PDD) should be supported by the local government district / local town, as confirmed in the Minister of National Education of the Republic of Indonesia, No. 20 of 2011.

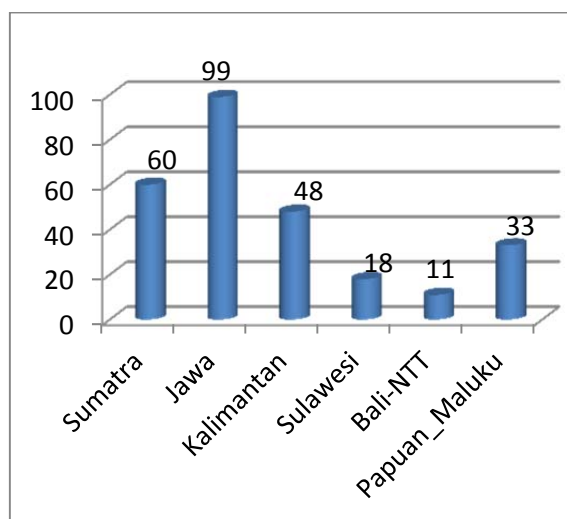


Fig. 2. Projection of Community College quantity in 2012 - 2015. ⁷⁾

Based on the access on May 5, 2016, at the Academy of Community database in the Ministry of Research, Technology and Higher Education describes that the number of new State Community College is 92 AK. This amount is only reached 34.2 percent of the initial prediction. As for the course of 92 Academy Community as much as 177 programs of study, consisting of: as many as 24 programs of study D1, and D2 as many as 153 courses. Some of the new Community Academy student does not have, because of inadequate infrastructure. The provision of land for the construction of the campus is the responsibility of local governments, while the construction of infrastructure facilities of learning is the responsibility of the central

government. Data on new admissions for four years, commencing from the year 2012 to 2015 are presented in the following table:

Table 1. Amount of students in year of 2012-2015. ⁸⁾s

Year	2012	2013	2014	2015	Sum
Male	813	2.064	2.097	1.388	6.362
Famale	1.591	3.621	3.580	2.352	11.144
Sum	2.404	5.685	5.677	3.740	17.506

From the description of the data from the new admissions in 2010-2014, there is a downward trend in the number of students who enroll in the Community College. This happens due to lack of synergy between Kemenristikdikti cooperation with the Government of Regency / City in equipping the facilities, educational facilities and program development. On the other hand the existence of human resources with the status of lecturers, instructors and educators have been relatively adequate. Number of lecturers for 92 Academy Community has reached 770 people, consisting of: Civil servant of Dikbud as many as 194 people, Civil servant of the Government of 169 people, and 407 people are not civil servants. The number of instructors who assist the learning practice, lab, and field practices amounted to 600 persons consisting of: Civil servant of Dikbud 82 people, civil servants, local government 199 people, and 319 people outside the civil service. Meanwhile, the number of education personnel as in administrative personnel, academic administration, laboratory and personnel hygiene as many as 485 people, consisting of: Civil servant from Dikbud 23 people, civil servant of the Government of 101 people, and not a Civil servant from 361 people.

From the description of the data during the four years of the establishment of 92 Community Academy which can accommodate a high school graduate / MAK / SMK as many as 17,506 people, of course, will increase the Gross Enrolment Ratio (GER) in higher education. Suppose that the Strategic Plan 2014-209 strengthen Ristekdikti in Dikbud 2010-2014 Strategic Plan, which puts priority programs and activities domain increase the relevance of

education and increased access to the target Academic Community 269 establishments throughout the County / City of Indonesia, with the assumption that each Academy Community has four courses (D1 and D2), and the study program has 30 students, the Academic Community of each year will be able to accommodate 32 280 people. Thus the strategic objectives in 2019 as a target Kemenristekdikti performance indicators can improve APK the college of 29.15% in 2014 to 32.56% in 2019, it is easy to be realized.

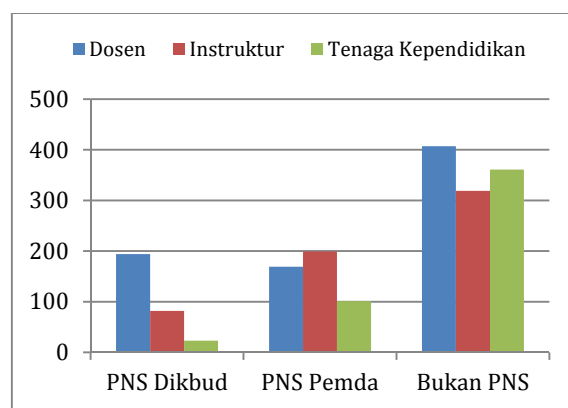


Fig. 3. Human Resources data in 92 CommunityAcademy. ⁸⁾

III. CONCLUSION

The pilot program of the Ministry of Education and Culture in 2010-2014 that have got the attention, and strategic programs at the local level Regency / City throughout Indonesia, through the provision of land for the establishment of the campus. Meanwhile, the Directorate General of Higher Education regularly roll out operational funds in developing educational programs and learning. Thus it is not impossible, by looking at an increasing number of people who entered the age of the college student is so high, the Community Academy will increase the percentage of the college APK significantly. Additionally, it will create more and more young people who have skills, high competency and productive that is expected to be able to compete with the regional workers in ASEAN.

REFERENCES

- 1) <http://ristekdikti.go.id/refleksi-1-tahun-kemen-terian-ri-set-teknologi-dan-pendidikan-tinggi>, download Mey 12, 2016
- 2) <http://www.kompasiana.com/wisnuandan-gjaya/mea-dan-pendidikan-yang-berkualitas>, downloaded on Juny 22, 2015.
- 3) <http://ristekdikti.go.id/refleksi-1-tahun-kemen-terian-ri-set-teknologi-dan-pendidikan-tinggi>, downloaded on January 2, 2016.
- 4) Emeagwali, N.S. (2007). *Community College Offer Baby Boomers and Encore*. [Online] Available: <http://www.acteonline.org> (March 17, 2007).
- 5) <http://www.americancommunitycolleges.com/isgarticles/communitycollege-stepping-stone.php>, accessed on 20 Februari 2016
- 6) (<http://www.studyadvisor.com.my/communi-tycolleges.htm>). downloaded on February 21, 2016
- 7) Direktur Kelembagaan dan Kerjasama (2013). Cetak Biru Akademi Komunitas, Direktorat Kelembagaan dan Kerjasama, Direktorat Jendral Pendidikan Tinggi, Kementerian Pendidikan dan Kebudayaan.
- 8) <http://akademikomunitas.ristekdikti.go.id/akademi/index>, downloaded on Mey 5, 2016.

DESIGN EXPERIENTIAL LEARNING ON COMPETENCE BASED TRAINING COMPUTER ENGINEERING AND NETWORKS IN VOCATIONAL HIGH SCHOOL

Riana T. Mangesa, Dyah D. Andayani

Universitas Negeri Makassar
riana.tangkin@unm.ac.id

ABSTRACT

Experiential learning is one of several models of learning that can be used to enable students to learn through the experiences of individuals in the learning process of computer engineering and network (*keahlian teknik komputer dan jaringan-TKJ*) Vocational High School. The purpose CBT of applying the learning model is to reflect a process of making meaning from direct experience through the pattern of activity gradually, step by step associated with the delivery of the contents of teaching materials. Therefore, the objective of this research is; (i) designing a model of learning in the CBT and (ii) Test the feasibility of the model and the instrument of the aspects contained in the learning experience directly. This study employed the research and development methods, which refers to the stages Borg and Gall. To assess the feasible and consistency of agreement among raters, an analysis was conducted by means of coefficients of Cohen's Kappa. The research was conducted at Vocational High School (SMK), SMK Negeri 1 Somba Opu in Grade X, which is used as a test subject. The results; (i) This study employed the research and development methods CBT models qualify the validity and (ii) the feasibility study model and instruments.

Keywords: experiential learning, competence based training, CBT, vocational high school

I. INTRODUCTION

Empirically professional labor problems in Indonesia have not achieved the expected results. Some of the problems with regard to Human Resources professional labor is as inadequate. Yusid Toyib, (2015) the number of workers certified construction sector is still small, (<http://bisnis.liputan6.-com/read/5-tenaga-kerja-konstruksi>).

Based on the projected growth of the industry in 2010 the productivity of IT personnel Indonesia just 25,000/year. This means that in 2015 Indonesia may experience a shortage of around 327 813 people. According to Telkom PDC Raden Center Director Moh. Kusno (2013), explained that the manpower needs of ICT competency areas is very high, moderate employment growth IT Indonesia only 9.2%/year, (<http://www.pikiranrakyat.com/pendidikan/kebutuhan-tenaga-ict>).

In particular problems in Vocational High School (*Sekolah Menengah Kejuruan - SMK*) is generally associated with limitations; equipment, the low cost of the practices, and the learning environment that does not conform to the world of work. This condition

causes the unpreparedness of graduates in entering the world of work. In connection with these problems , the fulfillment of claims curriculum to improve the system in a demand driven principles on which to base the implementation of competency-based learning will also problematic.

Sukamto (2001), stating that the reconstruction of the vision of education into the world of work through a learning approach, which gained a conducive environment, will evolve, if the momentum of decentralization can be utilized carefully to analyze the context of the potential and needs of each region.

SMK managed with reference to the vocational educational purposes, namely, to prepare skilled graduates who are ready to enter the world of work and the industry so that the curriculum should be developed based on the needs of the workforce, (demand driven). Equipment for the practice should be provided with the same criteria or at least closed with the world of work. Learning in SMK such that graduates actually ready to enter the world of work, in the sense of having

the knowledge, skills, and attitudes needed in the workplace.

Partnership *SMK* and industry in the organized learning is something that should be obvious. Learning a vocational education can not only organize learning that are school-based learning, but also must work-based learning because prepare graduates for work. Institutions of vocational education providers must also conduct educational programs with teaching and learning based CBT, which is trying to close between educational in schools with the industrial world.

Axioo industrial world, which is an institution of electronic products Indonesia, has a training program for vocational learners and educators throughout Indonesia, called Axioo Class Program (ACP). This program is held on the industrial grade TKJ in some vocational majors with the aim of preparing graduates according to the passing criteria in the industry (industrial competence). But do not set up a learning tool and educators.

According Hamalik O, (2007) learning is a combination that includes elements composed humane, facilities, equipment and procedures that influence each other to achieve the goal of learning itself. The learning process is the most basic activities in the whole process of education, because education success or failure depends on how one's learning process occurs after the end of learning activities.

Many teaching methods based industry that can be implemented by vocational education, such as EL learning as a process whereby knowledge is created through the transformation of experience, produce draft Work Based Learning (WBL) were trying to close between educational at school with the world of work. WBL is a contextual approach in which the workplace (business - industrial) provides a set of workplace-based learning experiences are structured. Riana Mangesa, Dyah D. A. (2015) explained that productive learning in vocational programs are inherently dual - based, learning in school and strengthening businesses and employment.

In the process of learning the learning process is expected to occur immediately (= EL) or a modification of an industry-based learning model, so that dual-based in the context of partnerships with industry, can

contribute to improve the quality of learning outcomes and graduate. Learners will go through stages in the learning process immediately, which is expected to be designed on the model EL -based CBT.

Instructional design , including the development of materials and learning activities, testing and assessment of materials, as well as the implementation of an overall process of learning about the needs and learning objectives. Instructional design as a discipline, discuss various studies and theories about development strategy and process learning and implementation.

Sudira Putu (2009), stated that the concept of competency-based learning/CBT focuses on what can be done as the think ability and consistently as an embodiment of knowledge, attitudes and skills possessed. Arends (Trianto, 2009: 41) , direct learning is one instructional approach is specifically designed to support the learning processes related to knowledge of something (declarative) and knowledge (procedural) is structured and activity patterns that gradually, step by step .

Powered Nur (2011) suggested teaching models directly aimed at the achievement of two main objectives, namely, the completion of academic content is structured and acquisition of all types of skills The principle of competency-based learning by Sudira Putu, (2009) the principles of competency-based learning include (1) Focused on learners, (2) Focusing on the acquisition of competencies, (3) learning objectives specific, (4) The emphasis of learning on performance/ performance, (5) Learning more individual, (6) the interaction using multiple methods: active, problem-solving and contextual, (7) Educators function more as a facilitator, (8) oriented to the needs of the individual, (9) Feedback is immediate, (10) using the module, (11) Study field (practice), (12) The assessment criteria using the reference benchmark.

Jubaedah (2010), CBT is learning process of planning, implementation and assessment refers to the mastery of competencies that have been defined as a standard reference for learning achievement standards compliant workforce. Characteristics of learning activities as

follows: (1) The learning activities are the mastery of competencies by learners; (2) The process of learning should have equivalence, competence condition where it will be used; (3) Activities are individual learning, the learners with other learners no dependence; and (4) Must be provided enrichment (enrichment) for students quicker and program fixes (remedial) for slow learners.

The quality of educational outcomes assessed both in terms of input, process and output, which is heavily influenced by the readiness of learning tools and learning approaches used and assessment. So as to achieve the learning objectives, need to be designed according to the needs competencies be achieved, Pardjono (2003).

TKJ field curriculum, vocational generally refers to K13. Therefore, in designing a learning tool EL-based CBT and evaluation tool refers to the curriculum in 2013 and the industrial world. Referring to the characteristics of direct learning the principles

and characteristics of CBT, is considered very appropriate to be applied in a modified learning called direct learning(=EL) model based CBT. Model is serving as guidance to educators in planning and carrying out teaching and learning activities.

II. METHOD

This study employed the research and development methods, which refers to the stages Borg and Gall (1983). This research seeks to produce a model Learning Direct (=EL) in the CBT, on the course for class X TKJ SMK Somba Opu. Appropriate stages of research R & D, do the needs analysis phase to identify and analyze to determine the competency profile, within the framework of the contents of the analysis results, curriculum and materials. Then design (design) prototype (learning tools, evaluation and research instruments) Judgement validated by experts of TKJ, lecturer and teacher.

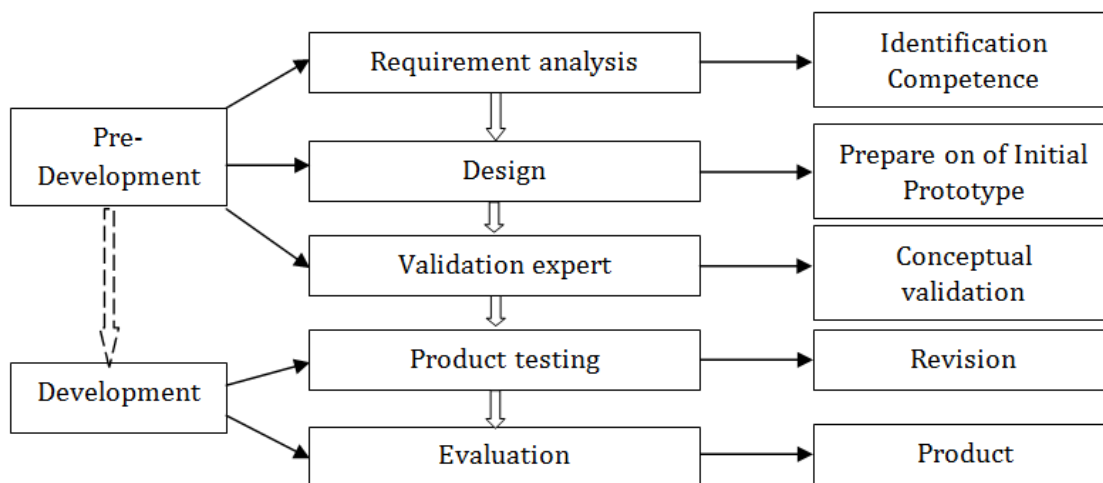


Figure 1 Stages of Research and Development

Chart stages of research in Figure 1, is divided into two main activities, including activities in the pre-development in the first year, include: (1) the requirement analysis phase, (2) the design of development phase and (3) the validation expert, then revised. After revision in draft, prototype is a model. The next activity at this stage of development, are: (4) the testing phase of the product; and (5) evaluation stage several schools.

Analysis of data is using qualitative descriptive analysis techniques. Grading scale using Likert scale with a scale of 1-4 refers Azwar Saifuddin, (2010) were modified.

Table 1 Categories Validity

No	Category	Values
1.	Valid	$3,6 \leq M \leq 4,0$
2.	Fairly Valid	$2,6 \leq M < 3,5$
3.	Less Valid	$1,6 \leq M < 2,5$
4.	Invalid	$0,0 \leq M < 1,5$

Description: M = mean score

III. RESULT AND DISCUSSION

Competency needs analysis conducted by collecting data documentation K13 curriculum competencies computer engineering expertise and networks. Furthermore, identifying the competencies

required by the world of work through a joint workshop. The results of the analysis of the needs formulated draft Competency Profile Skills Package Computer Engineering and Networks.

Table 1 Basic Competency Profile TKJ

No	Basic Competence (Competency Indicators)		
	Cognitive	Affective	Psychomotor
1.	Understanding the values of faith according their religion	Understanding the network operating system security.	Presenting the results of the audit server network
2.	Describing the greatness of God	Understanding the resource administration of computer networks.	Configuring the operating system integration with a network (internet)
3.	Practice the values of faith according to the teachings of his religion	Understand the results of the administration of network resources.	Configure network security systems and testing network security system
4.	Appreciating the work of individuals and groups	Understand communications (IP), tools (tools), and a digital system (how many ports).	Installing software for network monitoring
5.	Demonstrate scientific behavior in everyday activities.	Understanding how to configure integration with the network operating system.	Presenting the results of using the network monitoring software
6.	Getting used to live mutual respect, and ensuring orderly working environment.	Presenting the results of the configuration of the operating system integration with a network (internet)	Presenting the results of the configuration of traffic and bandwidth management on network
7.	Understanding the importance of cohesion in the work	Understanding IP management , each devices must has an identified IP	Enabling Integration with the network operating system (Internet)
8.	Understanding the types of security the network operating system	Understanding how traffic management and bandwidth on the network	Presenting the results of using the network monitoring software

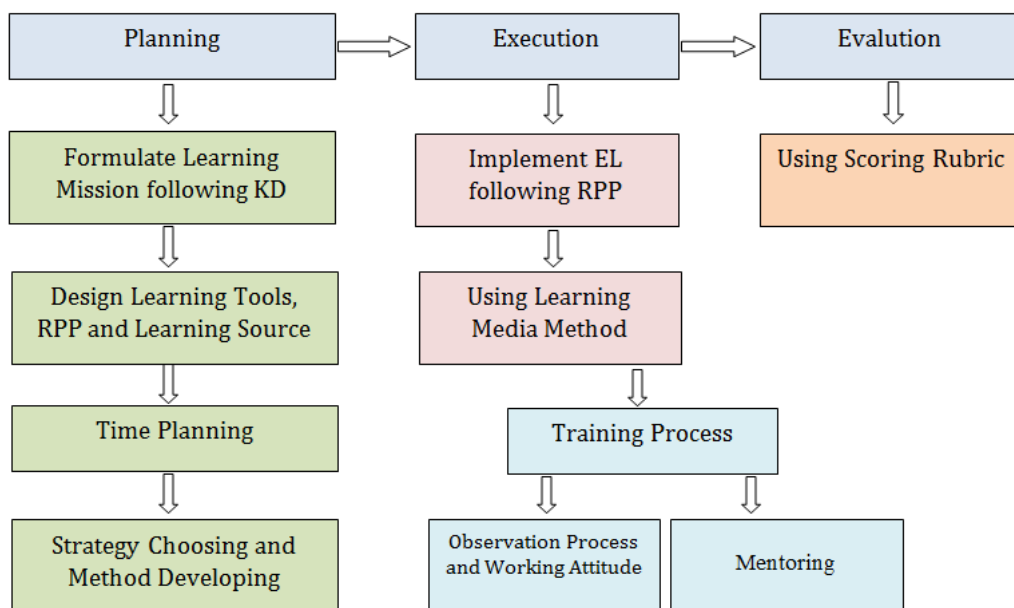


Figure 2 Draft Learning Model

The formulation of the competence profile is becoming the starting material design of the draft model of learning and research instruments as follow Figure 2. The research instrument that has been validated, analyzed by statistical tests Coefficient Cohen's Kappa, (Nitko A.J & Brokhart S.M., 2007: 80). Instrument to be reliable if coefficient (r) ≥ 0.70 . So the instrument used as feasible, are tabulated in Table 3.

Table 3 Results Validation Instrument and Device Model

Instruments	Rerata Skor (M)	Koefisien Kappa ®	Valid (3,6 ≤ M ≤ 4,0)
1. Assesment RPP	3,77	0,874	Valid
2. Scoring Rubric	3,91	0,873	Valid
3. Respon student	3,74	0,738.	Valid
4. Respon Teachers	3,80	0,749	Valid
5. Teachers activities	3,69	0,738	Valid

This research is R & D, referred to Borg and Gall development model, which results in EL CBT learning model in the field of TKJ SMK Negeri 1 Somba Opu. The results showed that a decent used models CBT is considered effective to improve the competence of learners, through the stages of learning directly.

In the opinion of Nur (2011) model of direct teaching is an effective way to teach skills, aimed at the achievement of two main objectives, namely, the completion of academic content is structured and acquisition of all types of skills. CBT learning model development is processing on learning EL. In detail, the research is done in several stages. Stage design is validated by expert of subjects/areas of expertise are same. All the instruments have been validated. Validity is the degree that shows where a test measures what it intends to measure, Sukardi (2011).

Based on the validation results, the draft was revised in accordance with the advice of the expert. Suggestions are used to revise some basic competencies and repair

instruments scoring. Based on Azwar Saifuddin (2014), validity refers to the extent to which the accuracy of a test or scale the measurement functions.

Some of the material found on the competence of the workshop to the world of work, has been formulated as a competence profile TKJ. According to Tri Budi Siswanto, (2010) partnerships with a vocational education institution in the world of work is one way learning institutions in the reconfiguration of its resources while utilizing a variety of competencies possessed by others.

IV. CONCLUSION

Competence shared identification method TKJ field practitioners and Telkom through the workshop is effectively used to analyze TKJ competencies required by the labor market, referring to the K13 curriculum. To design models and tools are needed learning competency profile. Model and learning devices suggests the importance of revamping the CBT learning competency-based workforce. EL models are empirically-based CBT has the advantage to improve the morale of participants and educators because there is an active mentoring, to help create a conducive learning atmosphere for learning that is individual, there is openness from various directions, encourage and develop creative thinking for participatory to find something.

REFERENCES

- Azwar, Saifuddin. (2014). *Sikap Manusia Teori dan Pengukurannya*. Yogyakarta: PustakaPelajar.
- Budi Siswanto. (2010). *Internalisasi Karakter melalui Pembelajaran Berbasis Tempat Kerja pada Pendidikan Vokasi Diploma III Otomotif*. Yogyakarta. Prosiding UNY.2010.
- Hamalik, Oemar.(2007). *Pendidikan Tenaga Kerja Nasional: Kejuruan, Kewirausahaan dan Manajemen*. Bandung: PT. Citra Aditya Bakti.
- Jubaedah,(2010). *Model Link And Match dengan Pendekatan Competency Based Training Pada Pembelajaran Tata*

- Graha di Sekolah Menengah Kejuruan, dalam Jurnal Universitas Pendidikan Indonesia*, 1412-565 X.
- Nitko A.J., & Brookhart S.M., (2007). *Educational Assessment of Students. (6thed.)*. Colombus, Ohio: Perason Merrill Prentice Hall.
- Nur, M. (2011). *Model Pengajaran Langsung*. Surabaya: Pusat Sains dan Matematika Sekolah Universitas Negeri Surabaya
- Pardjono, dkk. (2003). *Pendidikan kejuruan dengan kurikulum berbasis kompetensi berorientasi kecakapan hidup*. Makalah disampaikan dalam Lokakarya Pembelajaran dengan KBK Berorientasi Kecakapan Hidup. Tanggal 29 dan 30 April 2003 di FT-UNY.
- Riana.Mangesa., Dyah Andayani. (2015). *Pengembangan Model Pembelajaran Berbasis Kompetensi Bidang Kelistrikan di SMK*. *Jurnal Cakrawala Pendidikan*, Th. XXXIV, No. 3. Oktober 2015.
- Sudira, Putu. (2009). *Tujuh Prinsip Dasar Pendekatan Pembelajaran Berbasis Kompetensi*. <http://blog.uny.ac.id/putu-panji/tujuh-prinsip-cbt/>, diunduh 28 Januari 2016.
- Sukamto. (2001). *Perubahan Karakteristik Dunia Kerja dan Revitalisasi Pembelajaran dalam Kurikulum Pendidikan Kejuruan*. Pidato pada Rapat Terbuka Senat Universitas Negeri Yogyakarta.
- Sukardi.(2011) *Statistik Pendidikan*. Yogyakarta:Usaha Keluarga.Ash.Shaff
- Trianto. (2009). *Mendesain Model Pembelajaran Inovatif-Progresif*. Jakarta: Kencana Prenada Media Grup

MADRASAH ALIYAH ANALYSIS FOR THE IMPROVEMENT OF VOCATIONAL GRADUATES' COMPETITIVENESS TO FACE GLOBAL WORKFORCE

Adhan Efendi¹, Jeng Iswari²

Yogyakarta State University
e-mail: adhan.effendi@ymail.com

ABSTRACT

One of vocational education in Indonesia at the secondary level is MAK (Madrasah Aliyah Kejuruan/ Vocational Islamic Secondary School). MAK prepares learners to have the ready to work competence and a good personality based on the spiritual (religious) context that is considered capable of making graduates compete in the ASEAN Economic Community (AEC). The aim of this study is to find out the profile of MAK in the special province of Yogyakarta in its relation to the school readiness to increase the competitiveness of the graduates. The research is a survey study. Data collection is done by questionnaire, observation, interview, and documentation. Data analysis is conducted quantitatively. Research findings show that, in general, Madrasah Aliyah with vocational/skills learning in Yogyakarta is not good enough. The average score for each factor is as follows: the readiness of human resources 67.5% (enough), the readiness of the learning process 76.6% (good), the readiness of facilities and infrastructure 78.3% (good), management readiness 71.4% (enough), funding readiness 57.5% (not good), readiness of school culture 7.7% (good), partnership readiness 56.2% (not good), and the readiness of learners and graduates 66.2% (not good).

Keywords: MAK, globalization, competitiveness

I. INTRODUCTION

ASEAN Economic Community (AEC), which was set on 31st of December 2015, is the beginning of the opening of free economic interaction and integrated in the Southeast Asia region ranging from investment, trading of goods and commodities, as well as the use of workforce with the terms and conditions agreed by the member countries of ASEAN, including Indonesia.

The purpose of the establishment of AEC integration is to increase the competitiveness of the ASEAN region in the world market, to reduce poverty, and to improve the community welfare of the ASEAN member. This is expected to create a new equilibrium condition in the economy of a country widely, which would certainly affect the social, geographical and other conditions gradually.

One of the results of the AEC agreement is the free use of workforce. The workforce is closely related to Human Resources (HR) thus requires highly qualified and professionals human resources. Qualified human resources are formed in the pattern of training and education. In the education sector,

vocational education has contributed in generating human resources who are ready to work.

In Indonesia, vocational education is secondary education that prepares students primarily to work in a particular field so that a learner must have the competence to make him deserve a job. The competence is obtained by the learner while studying at an educational institution.

Formal educational institutions that focus on preparing students to have a job competence in upper secondary level are the vocational high school (SMK) and vocational Madrasah Aliyah (MAK). MAK is a form of formal education which organizes vocational education in secondary education. MAK is different from high school (SMA), in which SMA is oriented in common knowledge (cognitive knowledge) learning only, while MAK is oriented in cognitive and productive learning. The knowledge that is productive is expected to be a provision for graduates to be ready to work.

Indonesia puts MAK as part of a national education system that has a goal to improve professional, qualified, and highly competitive human resources, who has a good work ethic and skills. This has become

the focus of the Ministry of Education to MAK to face the global challenge in education. In its development, vocational education challenge today is how to prepare graduates who are capable of taking part and competing and capable of competing in the work environment.

Graduates of MAK are expected to be ready to work as experts in their field and/or be able to create jobs. But in fact, the condition of MAK now is not much different from other high schools, the Central Statistics Agency (BPS) said the number of unemployed graduates of MAK is greater compared than SMA which is 11.24% per August 2014, while the unemployment rate of high school graduates is 9.55% per August 2014.

MAK is a secondary educational institution that prepares learners to have ready to work competence. The competence is expected to improve Indonesian human resources so that, to compete in AEC. MAK is a form of formal education units in the target Minister of Religion which organizes vocational education with the peculiarities of Islamic religion at the secondary level. MAK does not only give the learners the work competence but also the ability to complete the social and religious knowledge which is expected to make students able to compete and develop themselves later on in the world of work.

This study maps the profile of Madrasah Aliyah with vocational/skills learning (MAK) in the special region of Yogyakarta and analyzes the readiness of MAK in improving the quality of graduates in order to face the competition in the global market. Analysis of school readiness is needed before the government decided on a policy or program to improve school quality, which means improving the quality of human resources to be optimized.

Madrasah Aliyah Kejuruan/ Vocational Islamic Secondary School (MAK)

MAK is a form of formal education unit which organizes secondary education as a continuation of the SMP, MTS or other forms equivalent (Sisdiknas Act No. 20 of 2003). Subsequently, education objectives of SMK according to Law No. 20 of 2003 are

divided into the general purpose and special purpose.

The general objectives of vocational education are: (a) Increase students' faith and devotion to Almighty God, (b) Develop students' potentials to become noble, healthy, knowledgeable, skilled, creative, independent, democratic and responsible citizens, (c) Develop students' potentials to have a national awareness, understanding, and respect for cultural diversity of Indonesia, (d) Develop students' potentials to have concern for the environment by actively contribute in maintaining and preserving the environment, and use natural resources effectively and efficiently.

While the specific purpose of vocational secondary education as follows:

(a) Preparing students to become productive human beings, able to work independently, fill the vacancies that exist as middle-level workforce in accordance with competence in the skills program chosen, (b) Preparing students to be able to choose a career, tenacious and persistent in the competition, adapt the work environment and develop a professional attitude in the field of expertise that interested them, (c) Provide students with science, technology, and art so they will be able to develop themselves in the future either independently or through higher levels of education, (d) Provide learners with competencies in accordance with the selected program expertise.

From the explanation of the Act, it can be concluded that vocational education is the secondary education that prepares the students for work in a particular field.

Implementation Model of MAK

MAK is a new concept of the development of vocational high school expecting the learners to have a good moral as recommended by the religion of Islam and have the benefit of skills that can be developed as a provision for independent living in the community after graduating. The concept of learning at the MAK is the program implementation skills in Madrasah Aliyah (MA) of Yogyakarta. The implementation of skills program at the madrasah / school is still varied, depending

on the policy of the school management, and has not been programmed as expected (Widodo, 2007).

In facing the global challenges including the internationalization of education, CAFTA, AFLA, AEC and the like, the readiness of all parties is required. SMK / MAK as a mid-level vocational institution that produces graduates to work in the industry need to be prepared as well as possible in order to be able to generate graduates who are competitive both inside and outside the countries (Ali, 2010). In the effort to improve the quality and competitiveness, SMK / MAK have a variety of challenges as described in Figure 1 (Sutrisno, 2007).

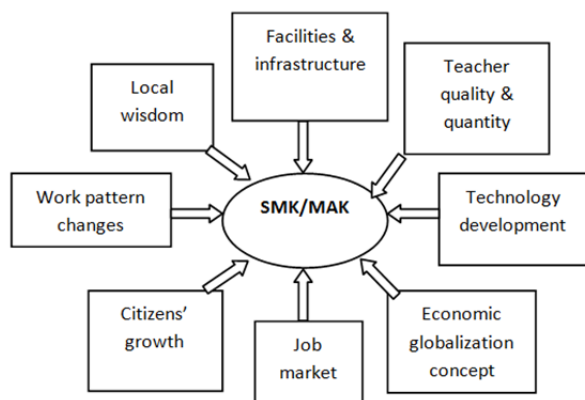


Figure 1. SMK/MAK future challenges

Moreover, according to DitPSMK (2008), the readiness of educational institutions in dealing with global competition can be seen from some of the main aspects. Some aspects of them are the readiness of human resources, learning process, curriculum, facilities and infrastructure, school management, school culture or the culture of work (academic atmosphere), financing, and accreditation.

II. METHOD

This research is a survey study which aims to explore the phenomenon and the phenomenon that is now becoming a hot topic in the community, namely the Madrasah Aliyah with vocational/skills learning (MAK) readiness in dealing with the ASEAN Economic Community (AEC). Vocational education becomes one of the

human resources producers that are expected to have the competence in the practice area. Human resources who have the competency could enhance the competitiveness and industrial capabilities of a region which will indirectly affect the readiness of Indonesia in facing AEC.

Data were analyzed related to the readiness of Madrasah Aliyah with vocational/skills learning (MAK) in the special region of Yogyakarta in the effort to improve the quality and competitiveness in order to face the global workforce. The research object is MAK or Madrasah Aliyah plus Skills in Yogyakarta, 4 samples from 15 Madrasah Aliyah in Yogyakarta.

The data collection was done in four ways, namely questionnaires, interviews, observation, and documentation. Data analysis using descriptive statistical quantitative-qualitative data supported the observation and documentation to reduce bias.

III. RESULTS AND DISCUSSION

The readiness of human resources (educators, staff, and students) is measured based on the aspects of MAK vision, commitment and motivation, communication skills in Bahasa Indonesia and international languages, and ICT mastery. The readiness measurement results on the aspects of human resources are presented in Figure 2.

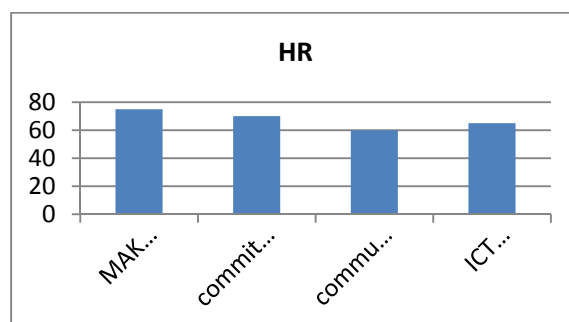


Figure 2 Human Resources Readiness

The readiness of the learning process is measured based on the attractiveness of the teacher in the teaching aspect, the use of instructional media, teaching preparation, teaching materials used, the references used and the learning process. Results of learning

process readiness measurement are shown in Figure 3.

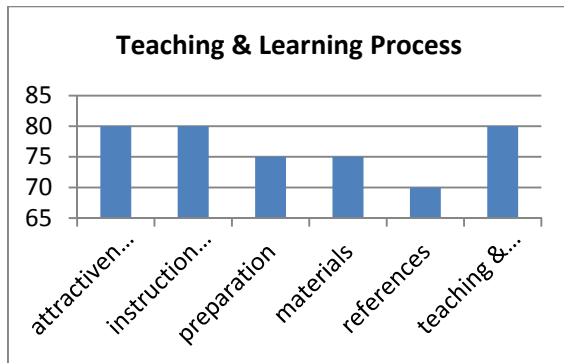


Figure 3. Teaching and learning process

The readiness of facilities and infrastructure is measured based on the feasibility aspect of school facilities and infrastructure, the number of classrooms, library condition and completeness, ICT facilities, facilities and infrastructure hygiene, and environmental conditions of the school. The measurement results of readiness of facilities and infrastructure are shown in Figure 4.

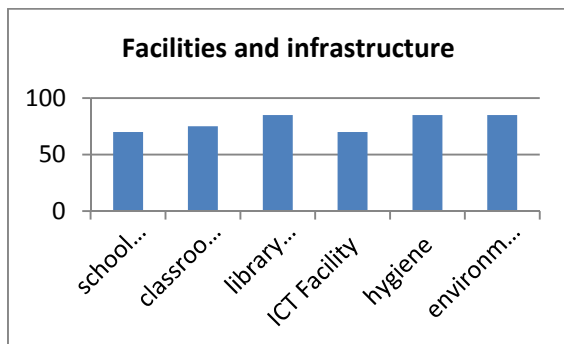


Figure 4 Facilities and infrastructures

The management or the school management readiness is measured based on the aspect of awareness of leadership that would improve the quality of education in schools, the implementation of school improvement program, the division of labor (job description), standard operating procedures, the relationship between teachers, students and leaders, attendance of students and teachers, and guidelines development for school activities. Results of school management readiness measurement are presented in Figure 5.

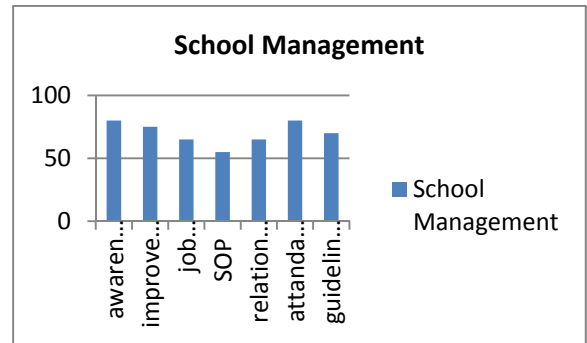


Figure 5 School Management

The readiness of funding is measured based on the aspects of the adequacy of funding, participation of parents in school activities funding, the funding of the activities of production units, and funding from grants and collaboration with industry. The results of funding measurement are shown in Figure 6.

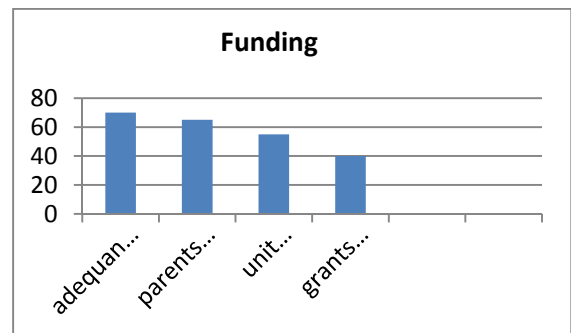


Figure 6. Funding

The readiness of school culture is measured by the paragon of teachers and school leadership, discipline, productivity, student study groups, and activities in school. School culture readiness measurement results are shown in Figure 7.

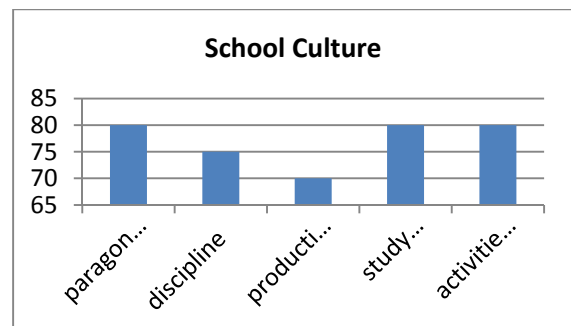


Figure 7. School Culture

Partnership readiness is measured based on aspects of school cooperation with business/industry parties or other institution, the place of competence test, student working practices placement, and job placement of students in the business/industry or other agencies. The measurement results in the partnership are drawn in Figure 8.

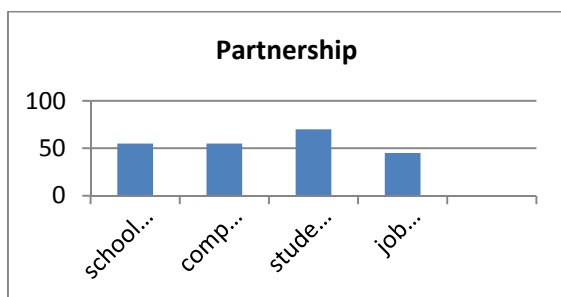


Figure 8. Partnership

The readiness of students and graduates is measured based on aspects of the public interest that want to get into the MAK, the national exam, absorption of graduates in the workforce and the percentage of graduates. Results of measurement of learners and graduates readiness are presented in Figure 9.

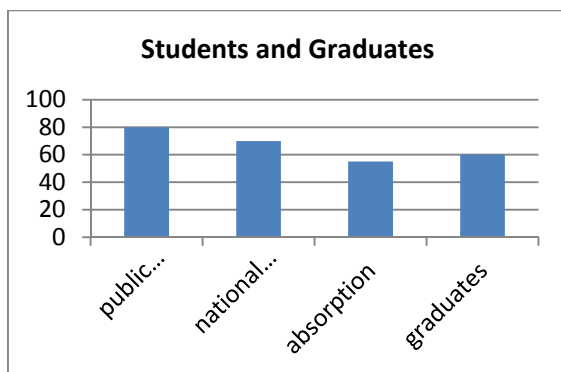


Figure 9. Students and Graduates

Based on the results of human resources questionnaire data reviewed in four aspects, two aspects are in a good category and other two aspects are in the enough category (first is the communication skills in Bahasa Indonesia and international language, the second is ICT mastery). Data from the questionnaire is relatively consistent with the results of interviews and observations stating that human resources

still not using both full Bahasa Indonesia and International language (Examples: English and Arabic) even though the school has organized a language day once a week. English mastery should be improved minimally in the aspect of the ability to understand the books and articles in English. Teachers whose English proficiency with a TOEFL scores more than 450 are still very limited. There are many teachers who do not have a TOEFL certificate or certificates of other language skills. Although English is not the only aspect that affects, the language has a strategic role in improving the quality of education in responding to global challenges. In the aspect of ICT mastery, both teachers and students do not have too much power because in the school, the internet access is not full spot wifi and the computer facilities at the MAK are still insufficient.

The readiness of the learning process is measured in six aspects. The results showed three aspects are categorized as good, others in the category enough when the learning process is a very important element in generating qualified graduates. It is more due to the lack of ability of teachers to follow the development of methods, media, and technology in education. The demands of the high number of teaching hours and yet MAK coherence in the concept of religious learning and vocational preparation causing less optimal learning, the use of ICT-based learning media, development of teaching materials, the use of references in English learning and e-learning.

For the readiness of facilities and infrastructure, in general, MAK in Yogyakarta have facilities that are not quite adequate. It is equally consistent with the results of interviews and observations stated that the feasibility of facilities in MAK should be improved, especially like classrooms, laboratories, and workshops. The number of the classroom itself is still lacking in some schools because of the high interest from the public who want to study in MAK and the schools also have not dared yet to expand the number of classes due to lack of classroom facilities. MAK focuses the vision and mission on the mastery of science

and technology and enhances the good attitude based on religion so that this kind of school has good facilities such as mosques that were clean and well maintained, toilets, classrooms and school environment that was clean and comfortable.

School management, in general, has been running pretty good. Data from the questionnaire showed that the aspect of awareness of the leadership to the quality of education in schools and the attendance of students and teachers gain good scores. On the other hand, the aspects of implementation program, the division of labor, the relationship between students and teachers as well as the development of guidelines for activities in schools scored enough. The aspects of SOP did not get good score through the interviews. It is because they lack teachers and instructors who use SOP as a guide when doing the practice or skills test. Some of the MAK in the special region of Yogyakarta use the cottage system so that the students occupy the dormitory around schools that allow them to be more disciplined in terms of attendance and be faster to know the environment for new students. Awareness of school leaders, teachers, and employees in meeting the challenges of AEC in the education aspect has been recognized by the school. But just to be more realistic, MAK focus more on improving the vision and mission of internally and not yet focused on competing globally.

Funding is a factor that is difficult to measure because it involves matters that are confidential and taboo. MAK has been separated from government funding in fund management. MAK did not get a good score in funding aspect. This is due to the MAK and industry cooperation that are still not running good and MAK still uses the proceeds of parent participation in helping the practical activities in the workshop. The production unit of MAK is still not maximized because MAK focuses on the development of independent business whose primary goal to educate and cultivate an entrepreneurial spirit for the students.

The school culture of MAK is an aspect that scores pretty good. The role model of

teachers and school leaders, group learning and other students' school activities aspects also got a good score, while aspects of the discipline and productivity scored enough. It is also consistent with the results of interviews and observations made in the MAK that states the learning culture in the form of MAK easier for MAK using boarding system which means that students live around the school. MAK also highlights properties or good morals. For the MAK, it is not only the ability of the skills they are selling but also rather the students' work ethic attitude that will make them more adaptable and strong in the community.

Cooperation (partnership) between MAK with stakeholders is an important aspect in the development of MAK in facing the AEC. Based on the results of questionnaires, job training placement aspect scored enough while aspects of school cooperation with the industrial world, the existence of a competency test and job placement of students in the industry got a not good enough score. The aspect of job training placements or internships in MAK that works with the industry around the school aims to provide a real experience for the students according to their expertise. Aspects that got not good score considered reasonable by the party leaders and teachers because MAK still has not yet done many MOU with the industry but some schools have already collaborated with the University in Yogyakarta such as UPN, UGM, UNY, and UAD. MAK does not only provide the competence ability to students but also focus more on educating students to entrepreneurship later on. The job market for MAK graduates is no longer held by the school because the school is focused on educating students to become entrepreneurs.

The readiness of students and graduates were evaluated from four aspects, only the aspects of the public interest that want to continue to MAK got a good score while aspects of the national examination, absorption of graduates in the workforce and the percentage of students' graduation still got a not good score. This is consistent with the results of interviews and observations that the public interest of MAK

that mainly located in rural areas is very high. Absorption of graduates in the job world still scored poorly because MAK graduates still have to compete with high school and vocational school graduates to get a job, limited job opportunities and the lack of cooperation with the industry make MAK graduates are not optimally absorbed in the industrialized world.

IV. CONCLUSION

From the analysis of the data and discussions, the two following formula can be concluded. First, Madrasah Aliyah with vocational/skills learning in Yogyakarta is generally not good enough. The average score for each factor is as follows: the readiness of human resources 67.5% (enough), the readiness of the learning process 76.6% (good), the readiness of facilities and infrastructure 78.3% (good), management readiness 71, 4% (enough), the funding readiness 57.5% (not good), school culture readiness 7.7% (good), partnership readiness 56.2% (not good) and the readiness of learners and graduates 66.2% (not good).

Second, MAK has a lot of things that need to be considered in improving the competitiveness of graduates to face the globalization of workforce which are the aspect of human resources, management readiness, readiness of funding, and partnership and students and graduates

readiness. In general, MAK still focus on improving students' skills in order could be able to compete locally but in fact, has not been global. Overall, the potential development of MAK is quite good, especially in the aspect of students' work ethic, work attitude and students potential to evolve.

REFERENCES

- Ali, M., and Hartoyo. (2010). *"Analisis Kesiapan SMK dalam menghadapi Internasionalisasi Pendidikan"*. Laporan Penelitian. Yogyakarta: Pusat Studi Pendidikan Teknologi dan Kejuruan bekerjasama dengan Pusat Studi Kebijakan Pendidikan Lembaga Penelitian UNY.
- DitPSMK. (2008). *Panduan Evaluasi Diri Sekolah Menengah Kejuruan Bertaraf Internasional (SMK - SBI)*. Jakarta: Departemen Pendidikan Nasional, Direktorat Pembinaan SMK.
- Sutrisno, D. (2007). *"Menuju SMK Bertaraf Internasional"*. Makalah disampaikan pada acara Persiapan Pelaksanaan Evaluasi Diri SMK Bertaraf Internasional. Jakarta.
- Widodo, Noto. (2007). *Pengembangan Model Pembelajaran Kejuruan di Madrasah Aliyah Kejuruan Daerah Istimewa Yogyakarta*. Yogyakarta : Fakultas Teknik UNY.

VOCATIONAL STUDENTS' SELF-AWARENESS AND LEARNING NEEDS TO SURVIVE AND THRIVE IN THEIR JOB-LIFE

Adi Suryani¹, Usman Arief², Tri Widyastuti³

ITS (INSTITUT TEKNOLOGI SEPULUH NOPEMBER)

e-mail: adisuryani.rahman@gmail; usman@mku.its.ac.id; dani_its@yahoo.com

ABSTRACT

Preparing vocational students to be ready to face their job life needs continuous and long process. The fast changes of job markets demand vocational students to be ready to adapt themselves to various job contexts. These job environments can be different from one job to another jobs. This implies that vocational students need to be self-reliance. They should be able to assess and monitor what they need, what may lead to their success and be aware of their own selves (what motivates them, what are their strengths, what they need, what are their own weakness and are they ready to compete in job market). Thus, this study aims to examine some vocational (polytechnic) students' self awareness and learning needs to grow. The data are collected from fifty-three written responses of polytechnic students. The data show that vocational students feel the need to equip themselves with various soft skills instead of just technical job related skills. They highlight the need to acquire and develop team/organizational learning, master public speaking, social communication, time management, leadership, English language, problem solving and critical thinking. They also feel that to get desired job, they should internalize certain characters: being responsible, self-independent, discipline, self-confidence, well self-adapted, being loyal, hard work, be resilient and being initiative. It is not sufficient to acquire job related characters, they also need to be able to behave ethically and religious. This study indicates that to be holistic vocational learners and doers, vocational students need building self from inside and building self from outside by combining affective, social and cognitive capacities.

Keywords: self-awareness, learning needs, learning motivation, self-learning, soft skills

I. INTRODUCTION

Vocational students are different from non-vocational students in some aspects. They are prepared to work or expected to start their job career earlier than their counterparts. There is also a common conception that they are forced to take vocational study due to financial issues and limitation. They should help their parents. The other common perception is they are losing competition with their counterparts to enter non-vocational program of study. However, not all vocational students have similar perception or are under similar reasons or forces to enter vocational study program. Other vocational students may have innate interest to learn vocational knowledge. They prefer to have practical cognition better than theoretical understanding. Other students may love vocational study because they see other vocational students' success in their job career. This indicates that vocational students may learn for different reasons which may affect their learning motivation.

The complexity of job life requires vocational students to learn not only cognition knowledge which relates to technical operation or the hardware of their job, but also affective and social knowledge which relate to software and humanware. Within their job life they will not only doing their main (core) jobs, but also performing non-core part of their job, but this non-core element decides their job success. Those non-core jobs include regulating self and social life. They should be able to manage their own selves, motivate, seek for opportunities to develop, handle self-conflict, development initiatives (autonomous), independence, resilience, and adaptation. Since these selves are surrounded by social environment, they should be able to develop social competencies. These may cover learn from other people, communicate effectively, team work capacity, cope with interpersonal conflict. The dynamics and development of their workplace tend to press them to learn cognitively, affectively and socially. This indicates that it is significant to equip

vocational students' interpersonal and intrapersonal competencies.

In this study, we intend to explore vocational students' voices on what they need to learn to develop. Thus, it is focused on students' views and their self analysis on what they need. The discussion is specified to examine four main aspects. Those are students' self motivation, self-readiness to face global era, soft skills they require to develop and self-effort to prepare themselves to work in global era. The main aim of this study is providing learning need profile of vocational learners viewed from their self awareness.

There are two main issues we intend to explore. Those are: (1) How do they perceive their readiness to enter their workplace (preparedness to work)? This includes what are their efforts to prepare themselves, (2) What they feel/think they need to be successful in their workplace?

1.1. Job Competencies

Vocational students should not only develop their technical-cognitive skills. They should be taught to acquire and build up their intrapersonal skills. Many intelligent workers cannot survive in their workplace because they do not know how to socialize/interact, communicate and regulate themselves during the process of interaction. This indicates that vocational learners need more than technical-cognitive knowledge. It is significant for vocational education to include tacit and explicit knowledge (Hadi, Hassan, Razzaq & Mustafa, 2015: 1164). Delahaye and Brian (2002, cited in Hadi et. al., 2015: 1164) state that explicit knowledge tends to be conscious and can be conveyed through verbal communication, while tacit knowledge tends to be unconscious, individualized and difficult to be validated. To do their job obligation, workers need competence. It indicates one's capacity to execute their task (Hadi, et. al., 2015: 1166). Furthermore, Hadi, et. al. (2015: 1166) exemplifies groups of competencies required in workplace: capacities, dedication, understanding and skills. These competences should not be stagnant, but it should be maintained and developed through the process of continuous learning. Vocational

students should be able to increase their competencies after they are leaving their formal study. The nature of industrialized corporations which continuously changes forces its workers to learn during their job life (Velde, 1999: 437). Furthermore, Velde (1999) emphasizes the need to consider vocational job competencies from the interpretative-relational view which argues that how a worker does their job is contingent on how he/she perceives their work and experiences. Thus, a worker's performance on his job represents how he/she thinks about his/her job. Sandberg (1994, cited in Velde, 1999: 441) mentions "intentional view of competence represents a new way of looking at competence where the individual's dynamic conception of the work and his/her relationship to it is recognized." Furthermore, Sandberg (1994, cited in Velde, 1999: 441) suggests phenomenological approach as a way to implement intentional competence and highlights the need of worker's experience. This view is relevant to application of constructivism in workplace. Each worker may build their own meaning/interpretation based on certain workplace situation (Kerka, 1997). Farmer, Buckmaster and LeGrand (1992, cited in Kerka, 1997: 3) argue that workplace learning represents "constructivism, situated learning and cognitive apprenticeship."

Other researchers highlight different area of skills required to contribute to worker's job competencies building. Some of those skills are using ICT skills to communicate, share, exchange information in workplace (Mustapa, Ibrahim & Yusoff, 2015), stimulate self interest, maintain the interest and self-efficacy (Sargin, Baltaci, Bicipi & Yumusak, 2015), teamwork skill (Hannes, Raes, Vangenechten, Heyvaert & Dochy, 2013; Wijnia, Kunst, van Woerkom & Poell, 2016), communication skill (Awang & Daud, 2015), reasoning, deciding and goal orienting skills (Koopman, Den Brok, Beijaard & Teune, 2011), cognitive and scholastic capacities (Volodina, Nagy & Köller, 2015) and career learning capacity (Kuijpers, Meijers & Gundy, 2011). Baartman and de Bruijn (2011: 126) classify job competencies into six categories: conceptual understanding, problem -solving,

professional skills, knowledge development, occupational identity and job performance. Rus, Yasin, Yunus, Rahim and Ismail (2015) argue that vocational education should be concentrated on experiences.

Success in workplace also tends to be influenced by workers' personality, their interest, career choice and suitability between person and job available (Song & Chon, 2012). Personality and behavioural roles of workers should be taken into account to educate vocational students (Song & Chon, 2012). A worker's can accomplish his/her job well when he/she can conform him/herself to his/her work environment (Šverko & Babarović, 2016). Savickas (1997, cited in Šverko & Babarović, 2016) mentions that workers need to develop career adaptability which represents one's capacity to accomplish his/her job, deal with changes and handle task stress. Savickas and Porfeli (2012, cited in Šverko & Babarović, 2016: 91) define career adaptability capacity as "self regulation mechanism or capacities that person can rely on to solve unfamiliar, complex or ill-defined problems that can arise from developmental vocational tasks, occupational transitions and work traumas. Thus, vocational education should be directed to build competencies which combine one's knowledge, skill and attitude (Eraut, 1994; Kaslow, et., al., 2007, cited in Baartman & de Bruijn, 2011: 127). The other need which should be significantly incorporated into vocational education is students' capacity to learn about learning. Vocational students need to know how to be responsible on their own learning (Choi & Kang, 2014: 3520) and be independent in handling their study weariness (Cai & Xi, 2015).

In building vocational students' competencies, educators face diverse challenges. One of those challenges is representing authentic workplace environment into classroom (Hämäläinen & Oksanen, 2012). The other issue relates to incongruity between vocational learning programs and job reality (Sharon, 2009, cited in Behroozi, 2014: 266).

1.2. Self Awareness and Self-Regulated Learning

Job in the global era can be dynamic. This indicates that possessing knowledge from their formal education after they leave their higher education level is not sufficient. They should be able to teach and learn by themselves responding to the changes in their workplace. They should develop self awareness, self learning and self regulation.

Self awareness represents one's capacity to be conscious on his/her own affection, behaviour and attitudes to respond certain circumstance (Benbassat & Baumal, 2005: 156). This self awareness is related to self regulation in which students are expected to develop capacity to generate things from their own thinking, emotion and behaviour (Zimmerman, 2000, cited in Zimmerman, 2002: 65). Zimmerman (2001, cited in Zimmerman, 2002: 65) argues that self awareness can reflect one's preparedness which is significant for individual's transformation. The concepts of self awareness and self regulation highlight students' individual differences. It is vital for students to know about themselves to deal with their strengths and weaknesses (Zimmerman, 2002: 65). Self regulated learning is essential for vocational students to continuously learn in their workplace. This is as argued by Zimmerman (2002: 66)

"Self-regulation is important because a major function of education is the development of lifelong learning skills. After graduation from high school or college, young adults must learn many informal skills informally. For example, in business settings, they are often expected to learn a new position, such as selling a product, by observing proficient others and by practicing on their own. Those who develop high levels of skill position themselves for bonuses, early promotion, or more attractive jobs. In self employment settings, both young and old must constantly self-refine their skills in order to survive. Their capability to self regulate is especially challenged when they undertake long-term creative projects, such as works of art, literary texts, or inventions. In recreational settings, learners spend much personally regulated time learning diverse skills for self-entertainment, ranging from hobbies to sports" (p.66)

Self regulation involves behavior and process to get information and skill (Zimmerman, 1989: 329). Self regulation allows individuals to check, lead and control their actions towards their objectives for

obtaining and broadening knowledge and developing self (Paris & Paris, 2001: 89). Self-awareness can also benefit students since they can evaluate themselves and evaluate their external environment (Duval & Wicklund, 1972, cited in Geller & Shaver, 1976: 99). Moreover, self awareness and self-confidence can intervene one's decision on his/her career (Amudson, 1995, cited in McCarthy & Garavn, 1999: 437). Furthermore, Rochat (2003: 719-722) divides self-awareness into five stages: confusion, differentiation, identification, permanence and self consciousness or metasef awareness. Awareness is not only about self, it is possible that an individual feels other people awareness. There is relationship between self awareness and other awareness in which represents self-awareness from the view of other person (Lewis et., al., 1989, cited in Asendorpf, Warkentin & Baudonnière, 1996: 313). Vago and Silbersweig (2012) mention that self awareness, self regulation and self transcendence can reduce one's straining and stimulate "intention, motivation, attention regulation, extinction, reconsolidation, prosociality, non-attachment and decentering."

II. METHOD

This study adopts a qualitative method. The data are gathered from vocational students' written responses on open ended questions. The research informants are fifty three vocational students from polytechnic study program. The open ended questions are designed as tools for collecting data on several aspects: motivation/interest, self-preparedness, required soft skills, self-learning and vocational learning challenges. The data are analyzed by adopting within and cross case analysis.

III. RESULT AND DISCUSSION

3.1. Data Representation

The collected data are classified into several categories. The first category is students' motivation (forces) behind their decision to take vocational study. It is assumed that their reasons on for choosing will provide basis for their learning spirit

during their study. The second category is students' perceived learning challenges they face during their learning process and their self awareness on what are important for them. It is assumed that during their learning process, they develop consciousness on what they need. The last category is their perceived readiness for job and their efforts to prepare themselves for job-life in the future.

The first category of data shows that vocational students decide to take their learning program because of several reasons. Their reasons can be classified into three main motives. The first motive is cognitive-practical drive. The vocational students mention that by taking vocational program, they get more practical knowledge instead of just theoretical understanding. They believe that practical learning allows them to understand the concept/theory easier. Below is sample of data showing a student's motivation to maintain his/her vocational study because of some added knowledge.

"Pada awalnya saya tidak tertarik untuk mengambil jurusan teknik baik di universitas maupun di politeknik. Akan tetapi setelah saya menjalani kuliah selama 4 semester sebagai mahasiswa politeknik saya baru paham dan mengerti bahwa kuliah di politeknik kita mendapatkan point plus. Selain kita diajarkan untuk menganalisis secara teori materi perkuliahan kita juga diajarkan untuk menerapkan materi yang kita peroleh secara praktik. Jadi antara teori analisis dan praktik seimbang. Sperti yang kita tahu bahwa nanti dalam dunia pekerjaan kita tidak hanya dituntut untuk terampil dalam analisis tetapi juga dituntut untuk terampil dalam menerapkan ilmu yang kita dapat dalam praktik. Maka dari itu saya sangat menikmati kuliah saya di politeknik."

(student 11)

The other advantages of learning vocational study are developing their analytical thinking/skill, deepening and broadening knoweldge that they gain in senior high school. The second drive is affective-behavioural motives. They believe that vocational institution can facilitates them to shape work ethos/mentality or build certain characters (for instance, responsibility, initiatives, discipline, commitment, ethical behaviour, sociability) required in their job-life. The other reason is they are motivating to continue their vocational interest that they have since they are in senior high schools. The third motive is social forces. This drive indicates that the

students' decision can be affected by their social surrounding and interest in developing their social capacities. The students express that they are motivated to learn vocational disciplines because of their parental support or orders/instructions. The

other reason why they taking vocational study is because they have successful role models around them who can encourage them. These role models can be their brothers and seniors. Friendship is their other reasons to choose vocational program.

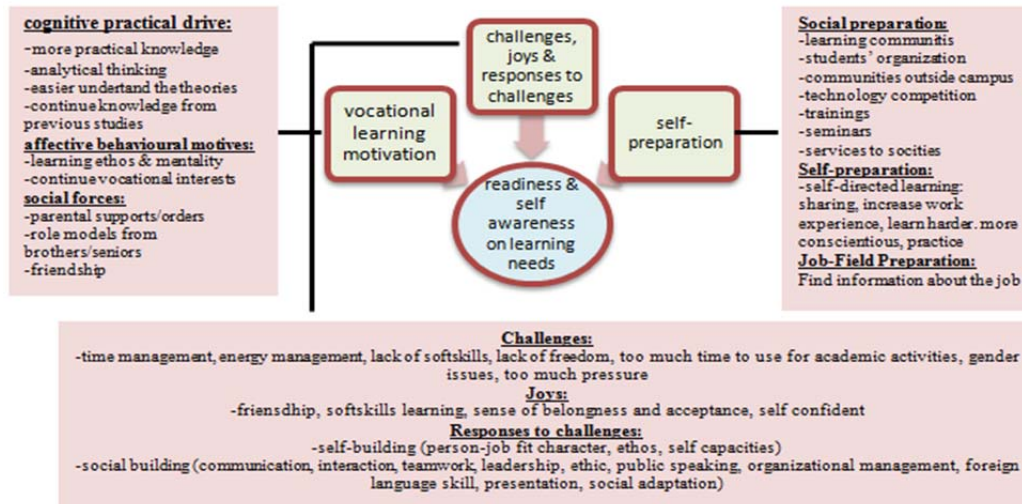


Figure 1. The vocational students' readiness and self awareness on learning

The second category of data show that vocational students are aware of learning and job challenges they face during their study and potentially they will encounter in their future job. There are several challenges that they identify which they find during their learning. Those challenges are relating to time management, energy management, perceived lack of soft skills, lack of freedom to select their own topic, too much time focused for academic activities, gender issues and too much pressure. Some of the students feel that what they take in their vocational study does not fit to their interests. In spite of challenges they encounter, they find several sources which make them enjoy their learning process. Those are strong bond of friendship, learn several softskills, develop sense of social belongingness and acceptance, feel self-confident to compete in global market. Below is a sample of data showing a vocational student's challenge and joy he/she feels during the learning process.

"Sebagai mahasiswa politeknik, suka yang saya dapat adalah rasa saling memiliki antar teman, karena dari

kelas 1 hingga lulus saya memiliki kelas yang dimana harus memiliki rasa saling memiliki satu sama lain. Lalu adalah rasa etos kerja keras dimana politeknik sendiri mengedepankan praktek, agar lebih siap kerja. Untuk dukanya, yaitu adalah banyaknya tugas, laporan yang harus dikerjakan dalam satu waktu. Hal ini memaksa kita untuk lebih meluangkan waktu untuk tugas ketimbang istirahat. Lalu perbedaan waktu libur dengan institut/universitas, politeknik libur tidak berbarengan dan waktu libur yang tidak sebanyak institut/universitas."

(student 3)

To respond to these challenges, the students need intrapersonal and interpersonal capacities. They express that they should prepare themselves (building self). This self building requires them to develop person-job fit characters, ethos and self capacities.

They mention a wide range of self-job fit elements. Those are responsibility, problem solving, risk taking capacity, survival skill, self-leadership, discipline, strong mentality, decision making competence, building commitment, self-confidence, hard working ethos, self-independence, internalize religious values, time and self management, critical thinking and initiatives. They also express that they should develop social capacities since they should work with others. There are several

interpersonal components the students mention: communication, interaction/socialization, teamwork, leadership, ethic, public speaking, organizational management, foreign language skill, presentation and social adaptation. The extract of sample of data below shows a vocational student's expression on his/her learning needs.

"1) disiplin, karena seorang yang sukses namun tidak disiplin akan gagal juga, 2) mampu bekerja sama, dalam dunia kerja, seseorang tidak mungkin mampu mengerjakan sesuatu sendirian, namun harus berkolaborasi dengan yang lain, 3) kepemimpinan, seorang pegawai tidak melulu menjadi bawahan, dalam keadaan tertentu juga berhak menjadi pemimpin, 4) kemampuan berkomunikasi dengan baik, cara seseorang berkomunikasi dengan yang lain dapat menunjukkan cara mereka berfikir."

(student 7)

They are aware that to prepare themselves, it is not sufficient to just learn their vocational disciplines. They should broaden their learning scope/areas to cover the dynamics of job market. They express that to prepare themselves they perform several actions.

The first action is participating in learning communities: students' organization, communities outside campus, contribute to technology competition, participate in seminars, training and society services. The second action is self-preparation: perform self-directed learning by sharing with (learning from) successful alumni (seniors), increase work experience by becoming part timers, prepare vision and objectives for their future, learn harder and be more conscientious, practice what they get in everyday life. The third action is job field preparation by finding some information about desired job, learn public speaking. However, the data also show that some vocational students are not ready to enter job market because of some reasons. The first reason is relating to the academic competencies, for instance they are still in the fourth semester, still concentrate mainly on theory, still do not understand the given theories. The other aspect is concerning with job-related skills, for instance soft skills (for instance, time management, discipline, , motivation to continue study into university

degree, insufficient working experiences, need more time to explore job-related knowledge, still just obtain job-related knowledge from apprenticeship.

All three categories of data are encapsulated in figure 1. It briefs all the data.

3.2. "We will meet people with various characters" and its implications

The data extract "we will meet people with various characters" implies the significant role of interpersonal aspect in one's job life. Today's globalization era eradicates people's boundaries. Individual cannot work alone to satisfy his/her demands, he/she have to collaborate with others (Schein, 1994: 12). This pushes people in its' era to work, interact and communicate across different regions and nationalities. Globalization forms recent economic and cultural regions inside and outside countries (Giddens, 1999: 13). This implies that today's students should be ready to work with people from different regions/cultures within and outside their countries. Thus, hardskill technical knowledge only is not sufficient for vocational students.

The data show that the students feel self-need to build their self capacities (person-job fit character, ethos, discipline, decision making, independence, responsibility) and social competences (communication, interaction, teamwork, ethic, public speaking, organizational management, foreign language skill, presentation and social adaptation). The following sample data confirms the finding on students' vocational need for social building.

"Soft skill sangat diperlukan untuk membekali diri kita untuk menjadi orang yang sukses dikemudian hari. Hard skill (akademis) saja tidak cukup untuk menghadapi dunia kerja nantinya. Karena dalam dunia kerja kita akan menghadapi banyak orang dengan karakter yang berbeda beda dan dari lingkup yang lebih luas. Maka dari itu dengan adanya pembentukan keterampilan soft skill sangat diperlukan, antara lain: mengikuti organisasi, mengikuti kegiatan pelatihan, mengikuti kegiatan pengabdian masyarakat, karakter building dll. Hal-hal tersebut sangat bermanfaat untuk mengembangkan soft skill kita, karena kita akan bekerja dan berinteraksi dengan banyak orang. Hal itu sebagai bekal untuk kita menghadapi dunia kerja nantinya."

(Student 2)

How the students in their job life build/develop his/her private self can affect his/her social self. When he/she is not discipline, be irresponsible or cannot interact appropriately with others, it can stimulate conflict, obstructs group/team/organizational coordination, lead to job dissatisfaction and may affect job longevity. The grounding construct of organization is the coordination of activities for reciprocal assistance (Schein, 1994: 13). As one form of organization, companies require workers who can be coordinated to reach organizational goals/production. This implies that the worker should be able to regulate themselves (their self-aspects) and conform to the coordination of company. This also can indicate one's capacity to perform self-group identification and adaptation. Worker's capacity to successfully interact with others in his/her job environment can lead to job satisfaction related to interaction context (Katz & Van Maanen, 1977, cited in Schein, 1994: 88).

This is relevant to the data which show that the vocational students learn teamwork by participating in students' organization, following technology competition and joining service for community activities. Through these activities the vocational students may learn how to socialize with others. Within the organization context, this socialization process is significant because through this interaction members "learn the ropes" or try to know and study regulations, social norms and ways to interact with other people appropriately (Schein, 1994: p. 21).

The data also show that the students are aware that they should be both be independent and dependent. This implies that they should be able to both learn individually and integrate their individual learning into group/team learning which accumulates in organizational learning. This requires the students to perform an integration of adaptive, generative and transformative learning. Adaptive learning encourages them to perform self adaptation to the changes occur in group/team, generative learning enables individuals to learn new attitude, knowledge as groups experience new changes and transformative learning allows self and groups to engage in

dialogue and reflect from new experiences (Sessa & London, 2006: 119-123). All of these learning processes is significant for the students to conform and adapt to group's changes.

Their capacity to adapt to group of people and group's changes can allow them to be fluid and can work with different people. Surrounding aspects, including work structure, site and work agenda can push people to interact with other certain people (Schein, 1994: p. 153). Successful effort to adapt can result in group/social acceptance. Failure in self-group adjustment can raise psychological issues for the members (Schein, 1994: 156).

During the process of learning in their vocational study, the students experience happiness because they can develop strong bond of friendship with their peers. This can provide direct social learning experiences for the vocational students. Students' successful social adjustment is not indicated by grades, but their capacity to interact with others (Hartup, 1992, p. 1, cited in Linke, 2011: 14).

The study also finds that the vocational students-informants are able to produce self-awareness on their own learning situations/contexts (learning motives, needs, readiness, challenges, happiness and self-initiatives to expand their capacities). This self-resources can be useful for them when they enter their workplace. They should explore what they need to develop in their workplace. Learning needs excavation on what is applicable in certain environment (Claxton, 1999: 12). By having self-awareness capacity they can observe their workplace environment and examine what they need to learn to survive and grow. This indicates that what they will get after they leave their formal vocational programs, what they get from formal study will change, develop and cannot accommodate their needs anymore. Thus, they have to perform self learning to be workers who have capacity to do lifelong learning in any job environment. As stated by Claxton (1999: 13-14) "lifelong learning demands, for example, the ability to think strategically about your own learning path, and this requires the self-awareness to know one's own goals, the resources that are needed to pursue them, and your current

strengths and weaknesses in that regard.” Moreover, the students are aware of the significance role of people environment, as a

social and individual/private self demand for their success in workplace.

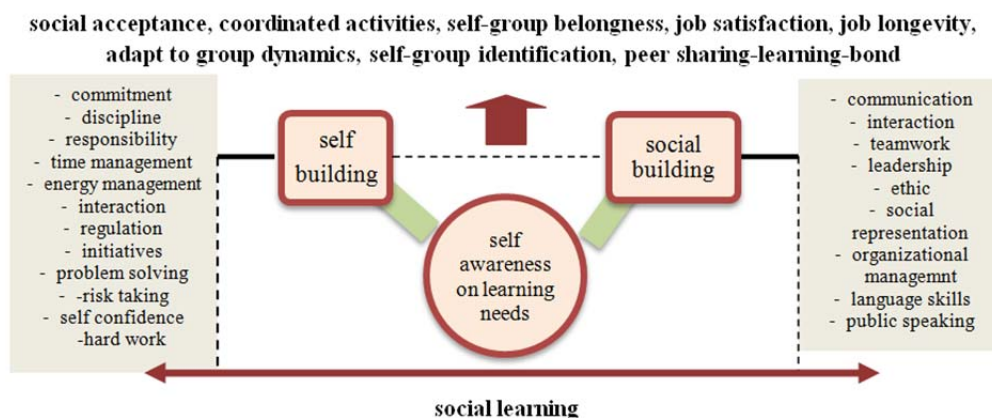


Figure 2. Implications of “we will meet people with various characters”

Figure 2 encapsulates the implications of the implications of ‘we will meet people with various characters. It extracts the essence of discussion.

VI. CONCLUSION

To face globalisation era, it is not sufficient to equip vocational students hard skills only. They are aware that in their work place, they must not only accomplish their work, but they have to interact/socialize with others to finish their job since they will not work alone. How they interact/communicate with others in their working environment can also determine quality of their job, job satisfaction, even job longevity. There are two aspects they should build: self and social factors. These two factors are interrelated. Self competencies will affect job social life and vice versa. “We will meet people with various characters” has several implications. Those are job satisfaction, especially interaction context, social acceptance, job longevity, adaptation to group dynamics/changes, peer learning and sharing. This social learning is significant since it is sufficient to work by bringing knoweldge from their vocational study. They should be able to survive and develop within various work environment by learning fom their real social surroundings.

REFERENCES

- A. Giddens (1999). Runaway world. How globalisation is reshaping our lives. Profile Books.
- A.M. McCarthy & T.N. Garavan (1999). Developing self-awareness in the managerial career development process: The value of 360 degree feedback and the MBTI. *Journal of European Industrial Training*, 23, 9, 437-445.
- A. Volodina, G. Nagy & O. Köller (2015). Sucess in the first phase of the vocational career: the role of cognitive and scholastic abilities, personality factors and vocational interests. *Journal of Vocational Behaviours*, 91, 11-22.
- B.J. Zimmerman (2002). Becoming a self-regulated learner: An overview. *Theory into Practice*, 41, 2, 64-70.
- B.J. Zimmerman (1989). A social cognitive view of self-regulated academic learning. *Journal of Educational Psychology*, 3, 329-339.
- C. Velde (1999). An alternative conception of competence: Implications for vocational education. *Journal of Vocational Education & Training*, 51, 3, 437-447. DOI:10.108/13636829900200087.
- D.R. Vago & D.A. Silbersweig (2012). Self awareness , self regulation and self transcendence (S-ART): A framework

- for understanding the neurobiological mechanisms of mindfulness. *Frontiers in Human Neuroscience*, 6, 296, 1-30.
- E.H. Schein (1994). *Organizational Psychology* (3rd Ed.). New Jersey: Prentice-Hall, Inc.
- F.C. Cai & H.F. Xi (2015). Study weariness of vocational college students and reform of the teaching mode in nursing basic technology course. *Chinese Nursing Research*, 2, 6-8.
- G. Claxton (1999). *Wise up*. London: Bloomsbury. Introduction. Pp. 1-19.
- H. Awang & Z. Daud (2015). Improving a communication skill through the learning approach towards the environment of engineering classroom. *Procedia-Social and Behavioural Sciences*, 195, 480-486.
- J. Benbassat & R. Baumal (2005). Enhancing self-awareness in medical students: An overview of teaching approaches. *Acad. Med.* 80, 156-161.
- J.B. Asendorpf, V. Warkentin & P.M. Baudonnière (1996). Self awareness and other awareness II: Mirror self recognition and synchronic imitation. *Developmental Psychology*, 32, 2, 313-321.
- J. Choi & W. Kang (2014). Korean vocational secondary school students' metacognition and lifelong learning. *Procedia-Social and Behavioural Sciences*, 116, 3519-3523.
- K. Hannes, E. Raes, K. Vangenechten, M. Heyvaert & F. Dochy (2013). Experiences from employees with team learning in a vocational learning or work setting: A systematic review of qualitative evidence. *Educational Research Review*, 10, 116-132.
- L. Wijnia, E. M. Kunst, M. van Woerkom & R.F. Poell (2016). Team learning and its association with the implementation of competence-based education. *Teaching and Teacher Education*, 56, 115-126.
- L.K.J. Baartman & E. de Bruijn (2011). Integrating knowledge, skills and attitudes: Conceptualizing learning processes towards vocational competence. *Educational Research Review*, 6, 125-134.
- M.A.S. Mustapa, M. Ibrahim & A. Yusoff (2015). Engaging vocational college students through blended learning: Improving class attendance and participation. *Procedia-Social and Behavioural Sciences*, 2014, 127-135.
- M. Behroozi (2014). A survey about the function of technical and vocational education: An empirical study in Bushehr City. *Procedia-Social and Behavioural Sciences*, 143, 265-269.
- M. Koopman, P. Den Brok, D. Beijaard & P. Teune (2011). Learning processes of students in pre-vocational secondary education: Relations between goal orientations, information processing strategies and development of conceptual knowledge. *Learning and Individual Differences*, 21, 426-431.
- M. Kuijpers, F. Meijers & C. Gundy (2011). The relationship between learning environment and career competencies of students in vocational education. *Journal of Vocational Behaviour*, 78, 21-30.
- M.Y.A. Hadi, R. Hassan, R. A. Razzaq & M.Z. Mustafa (2015). Application of thinking skills in career: A survey on technical and vocational training (TVET) qualification semi-professional job duties. *Procedia-Social and Behavioural Sciences*, 211, 1163-1170.
- P. Linke (2011). Social and emotional learning as a basis for curriculum. *Early Child*, 17, 1, 14-15.
- P. Rochat (2003). Five levels of self awareness as they unfold early in life. *Consciousness and Cognition*, 12, 717-731.
- R.C. Rus, R.M. Yasin, F.A.N. Yunus, M.B. Rahim & I.M. Ismail (2015). Skilling for job: A grounded theory of vocational training at Industrial Training Institutes of Malaysia. *Procedia-social and Behavioural Sciences*, 204, 198-205.
- R. Hämäläinen & K. Oksanen (2012). Challenge of supporting vocational learning: Empowering collaboration in a scripted 3D game-How does teachers' real time orchestration make a difference? *Computers & Education*, 59, 281-293.

- S.A. Sargin, F. Baltaci, H. Bicici & A. Yumusak (2015). Determining of vocational school student's attitudes toward the puzzle method. *Procedia-Social and Behavioural Sciences*, 174, 2856-2861.
- S.G. Paris & A.H. Paris (2001). Classroom applications of research on self-regulated learning. *Educational Psychologist*, 36, 89-101.
- S. Kerka (1997). Constructivism, workplace learning and vocational education. *ERIC Digest no.181*.
- V. Geller & P. Shaver (1976). Cognitive consequences of self-awareness. *Journal of Experimental Social Psychology*, 12, 99-108.
- V.I. Sessa & M. London (2006). Continuous learning in organizations. Individual, group and organizational perspectives. New Jersey: Lawrence Erlbaum Associates, Inc.
- Z. Song & K. Chon (2012). General self-efficacy's effect on career choice goals via vocational interests and person-job fit: A mediation model. *International Journal of Hospitality Management*, 31, 798-808.
- Z. Šverko & T. Babarović (2016). Integrating personality and career adaptability into vocational interest space. *Journal of Vocational Behaviour*, 94, 89-103.

THE FACTORS THAT AFFECTS THE SUCCESS OF ENTREPRENEURSHIP OF FASHION PROGRAM AT YOGYAKARTA

Ma'rifatun Nashikhah, Moch. Bruri Triyono

Pendidikan Teknologi dan Kejuruan PPs UNY

marifatun.nashikhah@gmail.com

ABSTRACT

The research aims to reveal the factors that affects the success of entrepreneurship of fashion program at yogyakarta. The factors that affects the success of entrepreneurship is entrepreneurial skill that viewed from business skill and technical skill of students. The research was ex-post-facto research, with quantitative method with the total of sample were 68 students which were established by the proportional random sampling technique. The data was taken by questionnaires at variable of business skill and the success of entrepreneurship with likert scale and rating scale, while the variable of technical skill used the secondary data from the score of end semester. The data was analyzed using the multiple regression analysis. The results of the research show that (1) there is a significant effect of business skill on the success of entrepreneurship students of fashion program and the contribution of 53.9%; (2) there is not significant effect of technical skill against the success of entrepreneurship students of fashion program and the contribution is very low 1.2%; (3) there is a significant effect simultaneously of business skill and technical skill on the success of entrepreneurship students of fashion program and the contribution of 52.7%.

Keywords: *technical skill, business skill, the success of entrepreneurship*

I. INTRODUCTION

Based on the agreement countries of ASEAN has done free trade, goods, services, capital and investment move freely between countries in ASEAN that called with Asean Economic Community in 2015 since 31 December 2015 (Ditjen PEN, 2012). The Free trade can strength cooperation among members of ASEAN and opportunities for each citizen of AEAN to work or open a business in the Asean Community. This is the challenge for the people of Indonesia, to prepare themselves compete with community such as Malaysia, Singapore, Brunei Darussalam and others.

Strategy that can be done is prepared of human resources through of vocational education, by improving the quality of the young generation of Indonesia to compete with other countries independently by being young entrepreneur. Education that giving a contribution is improved the ability and skill students as the younger generation prospective that qualified and productive, skilled and independent. Students as human resources generation must be able to free trade and compete in the global. Improving the quality of human resources through

education sector is important in preparation for global challenges.

The quality of Indonesian human resources shows the lack of preparedness to compete in the global era Asean Economic Community 2015. Based on Central Bureau of Statistics data in 2014 showed that the unemployment rate in Yogyakarta city is the domination of high school that reached 55.28%. While the open unemployment by level of education, vocational high school experiencing is the highest percentage 19.47%, 16.41% followed by senior high school, junior high and 17.78%. The unemployment rate shows that need to improve the quality of human resources in Indonesia. The increasing of percentage unemployment rate should be minimized, in order to reduce the unemployment rate in Indonesia (Badan Pusat Statistik, 2014).

The unemployment rate of vocational high school that experiencing the highest percentage of graduates make human resources of vocational high school must be improved. The quality of education is a process that integrated with the quality of human resource development process itself. Business development is high quality

education, among others to develop the potential of vocational graduates through the development of quality human resources. The various business education development quality is develop the potential graduates of vocational high school to be young entrepreneur that independent and successfully.

In vocational high school, development of human resources useful to prepare students improving the quality of potential because vocational education is the education that designed to develop skill, understanding, the attitude, habits of work, and appreciation that required by productive workers to enter the world of work and make progress at work.

David McClelland said that (Astamoen, 2008, p.11) the country will reach the prosperity if the number of entrepreneur a minimum of 2 % of the population. If the number of Indonesian projected 227 million people, at least should be more than 4 million entrepreneurs. It means, estimated that Indonesian still deficiency of 3.6 million more entrepreneur. If 10 % of 3.6 million entrepreneurs consist of some students of vocational high school, so problems unemployment who became polemic can giving impact benefits prosperity and economic development Indonesian.

Strategy the vocational education in the future must change that students do not only oriented to graduates that is readily worked to companies, but how the graduates of vocational high school can open business by being young entrepreneur who succeeded in accordance fields of expertise. Students who have potential skill can sharpen through education entrepreneurship or with provisions for entrepreneurship.

Training and learning about entrepreneur is preparing students from graduate of school and become entrepreneur young who succeeded. Training and guidance is carried out by providing strengthening to students to prepares to young entrepreneur successfully with identify the factors that affect the success of entrepreneurship of vocational high school students.

The concept that developed for developing and provisions for entrepreneurial skill students that viewed

from several aspects to find the factors of the success of entrepreneurship vocational high school students. The provisions is not only about knowledge about academic of entrepreneurship, but how to make the aspects of student competency that sharpened entrepreneurial skill. In this case, entrepreneurial skill is expertise to prepared students to start provision entrepreneurship, an entrepreneur is someone who creates a product, process, know market of needs and supplies of goods (Lambing & Kuehl, 2003).

Entrepreneurial skill is the merger of the two sides of the ability of someone to overcome difficulties and the challenges of business. The entrepreneurial skill someone can empower knowledge of resources, production, information technology, finance and marketing. There are several skill that can affect an entrepreneur, according to Lambing & Kuehl (Hendro, 2011, p.30) entrepreneurship was creative endeavor who built a value themselves who has not yet been into being and it could be enjoyed by the people, any successful of entrepreneur have four basic element which is the ability, courage, steadiness, and creativity to create creation. An entrepreneur must be able to management self in creating of entrepreneurial skill. The directorate education and training the community said an incubator entrepreneurial need a management systems or management that could support and the establishment of the an incubator entrepreneurial as expected that carry out a process learning of entrepreneurship directly in the practice effort (Direktorat Pembinaan Pendidikan Masyarakat, 2012).

So that focus of study is related to the success of factors entrepreneurship student of fashion program at Yogyakarta in some aspect.

II. METHOD

The research was ex-post-facto research, with quantitative method. The research of *Ex-post-facto* examine the dependent variable based on events that occurred and wants to track factors of the cause or something influence it. Purwanto (2012, p.181) said that the research of *ex-post-facto* is research where variable that

researched (dependent variable) have been at the time of the research, the researcher take one or more of the results and test the data with examined to the past of the event to find the cause of occurred.

The research have done to know how the influence of business skill and technical skill on the success of entrepreneurship of fashion program at Yogyakarta. In this case, the researchers observe, take notes carefully and systematically on various indicators of the skills so that known to influence on the success of entrepreneurship students of vocational high school of fashion program.

The research research have done at vocational high school at Yogyakarta were SMK Negeri 6 Yogyakarta, SMK Muhammadiyah 4 Yogyakarta, and SMK PIRI 2 Yogyakarta. The population were students of XII grade vocational high school in tourism expertise study of fashion program at Yogyakarta and the total of sample were 68 students which were established by the proportional random sampling technique. It is seen based on analysis of the third skills: soft skill, technical skill and business skill on success of entrepreneurship. Sugiyono thought (2012, p.117) the population and sample is the object/subject that possess the qualities and characteristic of certain that set by researchers.

Table 1. Calculation of sample every vocational high school at Yogyakarta

No	School Name	Population	Calculation of samples	Totals
1	SMK Negeri 6 Yogyakarta	50	$50/83 \times 68$	40
2	SMK Muhammadiyah 4 Yogyakarta	18	$18/83 \times 68$	15
3	SMK PIRI 2 Yogyakarta	15	$15/83 \times 68$	13
	Amount	83		68

Technique of collection of data is the way that used by researchers in collecting data. Technique of collection of data in this research is as follows: (a) the method of a questionnaire for measuring variable business skill and the success of entrepreneurship of student; (b) the method of documentation for measuring technical

skill vocational high school students. Documents that used, the results of value of technical skills at one of productive subjects students for measuring how far the skills influence the success of entrepreneurship student at fashion program.

Descriptive analysis used to analyze data by the describe of data that collected. In a description of data determine with the average value/mean(M), the middle value/median (Me), the value that often arise/ mode (Mo) and standard deviations (SD).

III. RESULTS AND DISCUSSION

Data description is purpose that giving the general description of the spread of data obtained in the field. The research on the influence technical skill and business skill on successful student of fashion program was conducted in three in vocational high school at Yogyakarta and the total number of 83 students were conducted sampling until they reached respondents as 68 a student of class 12 expertise fashion boutique as the sample. A description of the data is served from the result of this research purpose of giving the general description of the spread of data that obtained in the field.

Data on the business skill obtained with the closed questionnaire by the number of points as 12 statement. The data from the respondents, the score is 67 lowest and highest score is 100. The data using SPSS v.23 program, with the value of mean 79.79; median of 79; mode of 75; and standard deviations of 6,746; with the total of score of 5.426. Distribution of data business skill presented in the form of a frequency distribution in table follows:

Table 2. The Distribution of Data Frekuensi of Business Skill

No.	Class Interval	Class Limit	Freq.	(%)
1	67-71	66,5-71,5	7	10,4
2	72-76	71,5-76,5	19	27,9
3	77-81	76,5-81,5	19	27,9
4	82-86	81,5-86,5	10	14,7
5	87-91	86,5-91,5	9	13,2
6	92-96	91,5-96,5	2	3
7	97-100	96,5-100,5	2	3
	Amount		68	100

To understand the description of business skill on success entrepreneurship student of vocational school, counting by average score. From the result of the data was obtained the mean value of 80 and SD 7. So to know a tendency of business skill on the success of entrepreneurship student will based on categorisation as follows:

Table 3. Categorization of Business Skill

The Formula	The Range of The Score	Score	Category
$X \geq \bar{X} + 1.SBx$	$X \geq 80+1.7$	$X \geq 87$	Very High
$\bar{X} + 1.SBx > X \geq \bar{X}$	$80 + 1.7 > X \geq 80$	80-86	High
$\bar{X} > X \geq \bar{X} - 1.SBx$	$80 > X \geq 80 - 7$	73-79	Medium
$X < \bar{X} - 1.SBx$	$X < 81-1.6$	<73	Low

The result from the table categorisation of business skill on success entrepreneurship students of vocational school, from 68 the students were as follows: 1) there are 7 students (10,4%) as low; 34 students (49,9%) as medium; 14 students (20,6%) as high; and 13 students (19,2%) as very high , so that business skill of students on success entrepreneurship were the category of enough of high.

Data on the business skill obtained with the closed questionnaire by the number of points as 12 statement. The data from the respondents, the score is 68 lowest and highest score is 95. The data using SPSS v.23 program, with the value of mean 80,81; median of 80; mode of 78; and standard deviations of 5,852; with the total of score of 5.495. Distribution of data technical skill presented in the form of a frequency distribution in table follows:

Table 4. The Distribution of Data Frekuensi of Technical Skill

No.	Class Interval	Class Limit	Freq.	(%)
1	68-71	67,5-71,5	4	5,8
2	72-75	71,5-75,5	2	3
3	76-79	75,5-79,5	25	36,8
4	80-83	79,5-83,5	26	38,2
5	84-87	83,5-87,5	1	1,5
6	88-91	87,5-91,5	3	4,4
7	92-95	91,5-95,5	7	10,3
Amount			68	100

To understand the description of technical skill on success entrepreneurship student of vocational school, counting by average score. From the result of the data was obtained the mean value of 81 and SD 6. So to know a tendency of technical skill on the success of entrepreneurship student will based on categorisation as follows:

Table 5. Categorization of Technical Skill

The Formula	The Range of The Score	Score	Category
$X \geq \bar{X} + 1.SBx$	$X \geq 81+1.6$	$X \geq 87$	Very High
$\bar{X} + 1.SBx > X \geq \bar{X}$	$81 + 1.6 > X \geq 81$	81-86	High
$\bar{X} > X \geq \bar{X} - 1.SBx$	$81 > X \geq 81 - 6$	75-80	Medium
$X < \bar{X} - 1.SBx$	$X < 81-1.6$	<75	Low

The result from the table categorisation of technical skill on success entrepreneurship students of vocational school, from 68 the students were as follows: 1) there are 5 students (10,2%) as low; 45 students (66,2%) as medium; 8 students (11,8%) as high; and 10 students (11,8%) as very high , so that technical skill of students on success entrepreneurship were the category of medium.

Data on the success of entrepreneurship obtained with the closed questionnaire by the number of points as 11 statement. The data from the respondents, the score is 59 lowest and highest score is 100, with the value of mean 80,56; median of 79; mode of 75; and standard deviations of 9,010; with the total of score of 5.478. Distribution of data the success of entrepreneurship presented in the form of a frequency distribution in table follows:

Table 6. The Distribution of Data Frekuensi of The Success Of Entrepreneurship

No.	Class Interval	Class Limit	Freq.	(%)
1	59-64	58,5-64,5	1	1,5
2	65-69	64,5-69,5	6	8,9
3	70-76	69,5-76,5	18	26,4
4	77-82	76,5-82,5	20	29,4
5	83-88	82,5-88,5	5	7,4
6	89-94	88,5-94,5	14	20,6
7	95-100	94,5-100,5	4	5,9
Amount			68	100

To understand the description of the success of entrepreneurship student of vocational school, counting by average score. From the result of the data was obtained the mean value of 81 and SD 9. So to know a tendency of the success of entrepreneurship student will based on categorisation as follows:

Table 7 Categorization of The Success Of Entrepreneurship

The Formula	The Range of The Score	Score	Category
$X \geq \bar{X} + 1.9SBx$	$X \geq 81 + 1.9$	$X \geq 90$	Very High
$\bar{X} + 1.9SBx > X \geq \bar{X}$	$81 + 1.9 > X \geq 81$	81-89	High
$\bar{X} > X \geq \bar{X} - 1.9SBx$	$81 > X \geq 81 - 9$	72-80	Medium
$X < \bar{X} - 1.9SBx$	$X < 81 - 1.9$	< 72	Low

The result from the table categorisation of the success of entrepreneurship students of vocational school, from 68 the students were as follows: 1) there are 9 students (13,3%) as low; 32 students (47%) as medium; 11 students (16,2%) as high; and 16 students (23,6%) as very high , so that the success of entrepreneurship were the category of enough of high.

The following are distribution of the data on the success of entrepreneurship of vocational high school students that will be presented in figure 1.

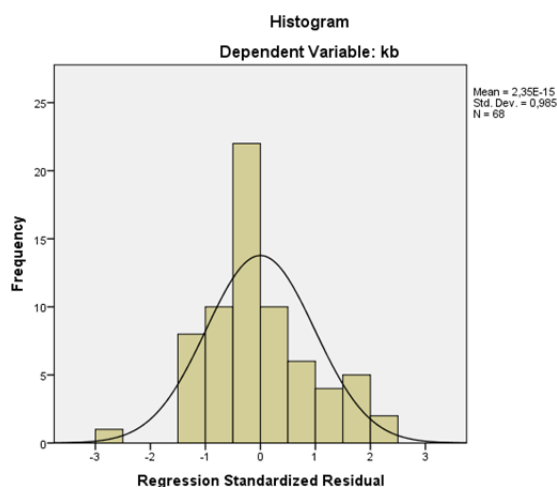


Figure 1. The Histogram of The Success of Entrepreneurship

The results of analysis RX1-y coefficient of 0.734; R2x1-y at 0.539; 8.791 t count equal to the magnitude of the value table = 1.6645 ($t > t$ table); and the significance value <probability (0.000 < 0.05). From the analysis above that the null hypothesis (H0) is rejected and once the research hypothesis (Ha) is accepted. It can be concluded that says: there is a significant influence on the success of the business skills of vocational student entrepreneurship program dressmaking skills. To state the size of the variable business skills contribution on the success of entrepreneurship, is determined by finding the determinant coefficient is $R^2 \times 100\% = 53.9\%$. This means that the variable business skills to contribute to the success of entrepreneurship by 53,9% and the balance of 46,1% is explained by other variables.

Based on the calculation on obtained the price of a coefficient variable business skill of 0.981 and the number of constant 2.290 so that the model of the regression is formed is $Y = 2.290 + 0.981 X_1$. This means that variable business skill be increased a unit so the success of entrepreneurship will be increased by 0,981.

Based on the result of this research prove that business skill influence on success of entrepreneurship student. From the result and discussion indicating that entrepreneur develop their business must have special skills as business skill to support their business. These skills expected to support enterprener to create an innovation, development, creation of the results of their products in accordance with trend and set their business .

An entrepreneur need the business development and business strategy which includes target consumers, the advantage, financial and marketing. These skills included in business skill, because business is a efforts to achieve gain by selling products to fulfilment the needs of the people. Business skill is an important factor in the success of entrepreneurship, how to prepare business from business planning, production management and strategies of decision making.

This will be very influence if an entrepreneur cultivate their business, must

be capable of having business skills that useful to an increase in the target business in achieving business profits. According Lambing and Kuehl (2003) an entrepreneur must have more interest on the business because it will be many challenges and obstacles to reaching a success.

The results of analysis R_{X1-y} coefficient of 0.110; R_{X2-y} amounting to 0.012; t count equal to 0.903 with the magnitude of the value table = 1.6645 ($t < t$ table); and the significance value $< \text{probability}$ (0.370 < 0.05). From the analysis above that the null hypothesis (H_0) is received and once the research hypothesis (H_a) is rejected. It can be concluded that reads: no significant effect between technical skills on the success of entrepreneurship. To state the size of the variable technical skills contribution on the success of entrepreneurship, is determined by finding the determinant coefficient is $R^2 \times 100\% = 1.2\%$. This means that the variable technical skills contributed to the success of entrepreneurship by 1.2% and the remaining 98.8% is explained by other variables.

Based on the calculation on obtained the price of a coefficient variable technical skills of 0.170 and the number of constant 66.814 so that the model of the regression is formed is $Y = 66.814 + 0.170X_2$. This means that variable technical skills be increased a unit so the success of entrepreneurship will be increased by 0.170.

Based on the results of was suspected that the variable technical skill do not influence directly at the success of students, but expected variable technical skill it would influence when supported other variables. There are several reasons why variable technical skill do not influence directly, because in entrepreneurship an entrepreneur not only are required to have technical skill but how can we take the idea to draw in creating business. Technical skill very important that owned students because these skills was the core of begin an entrepreneur. Technical skill should be owned, in accordance Thompson said that the purpose of vocational education is teaches students to producing, prove in accordance with the needs of the society (Billet, 2011, p.136)

In business technical skill will be useful to set a manner of production. An entrepreneur must have special competence, analytical capability, and the ability to used a in accordance with the technical. Technical skill very important as skill the nucleus within build the capacity of entrepreneurship. With the skills can be used provision students creates a creative product and innovative. But in the field of business, technical skill is not a requirement of success entrepreneurship of someone, because necessary by factors that support the level of success of maximum.

The results of analysis from technical skill and business skill simultaneously on the success of entrepreneurship, the coefficient of $R_{(X1,X2)-y}$ amounting to 0.735; $R^2_{(X1,X2)-y}$ amounting to 0.527, t count equal to 38.251 with the magnitude of the value table = 3.98 ($t < t$ table); and the significance value $< \text{probability}$ (0.000 < 0.05). From the analysis above that the null hypothesis (H_0) is received and once the research hypothesis (H_a) is rejected. It can be concluded that reads: there is a significant effect simultaneously of business skill and technical skill on the success of entrepreneurship students of fashion program.

To declare the size of donations variable business skill on the success of entrepreneurship, determined with $R^2 \times 100\% = 52.7\%$. This means that the technical skill, and business skill contributed on the success of entrepreneurship of 52.7 % and 47.3 % explained by other variables.

Based on the calculation that obtained the price of the coefficients variable technical skill of 0.000; and coefficients variable business skill of 0,676; and the constant of 15.125 so that model the regression equation is formed $Y = -1.740 + 0.000X_1 + 0.676X_2$.

Based on the result of this research prove that the variable business skill and technical skill influence the success of entrepreneurship. Every individual have the potential to achieve the success , depends on what the human trying to achieve it. Seen from potential of vocational high school students in entrepreneurship is very possible to achieve success.

According to Suryana & Bayu (2013, p.18) based on his research that a key to achieve success is the introduction of potential and having the superior character of entrepreneurship, by the introduction of potential themselves and develop the character of entrepreneurship is highly supportive of the success of an individual business, group and economic development.

Some skill are mutually pertaining to achieve the success an entrepreneur. So that second of the variable is a factor that can influence the success of entrepreneurship student expertise of fashion program.

IV. CONCLUSION

Based on the results of the analysis research and discussion, so the conclusions research as follows: there is a significant effect of business skill on the success of entrepreneurship students of fashion program and the contribution of 53.9%; there is not significant effect of technical skill against the success of entrepreneurship students of fashion program and the contribution is very low 1.2%; there is a significant effect simultaneously of business skill and technical skill on the success of entrepreneurship students of fashion program and the contribution of 52.7%.

REFERENCES

Astamoen, M. (2008). *Entrepreneurship dalam perspektif kondisi bangsa Indonesia*. Bandung: Alfabeta.

- Badan Pusat Statistik. (2014). *Statistik daerah istimewa Yogyakarta 2014*. DIY: BPS.
- Billett, S. (2011). *Vocational education purposes, traditions and prospects*. London : Springer Dordrecht Heidelberg.
- Direktorat Pembinaan Masyarakat. (2012). *Pembelajaran kewirausahaan masyarakat*. Yogyakarta: Aditya Media.
- Ditjen PEN. (2012). *ASEAN community 2015*. Jakarta: Kementerian Perdagangan Republik Indonesia.
- Hendro. (2011). *Dasar-dasar kewirausahaan*. Jakarta: Erlangga.
- Lambing, P.A. & Kuehl, C.R. (2003). *Entrepreneurship*. London: Person Education.
- Purwanto. (2012). *Metodologi penelitian kuantitatif untuk psikologi dan pendidikan*. Yogyakarta: Pustaka Pelajar.
- Sugiyono. (2012). *Metode penelitian pendidikan, pendekatan kuantitatif, kualitatif, dan R & D*. Bandung: Alfabeta.
- Sugiyono. (2014). *Metode penelitian kuantitatif, kualitatif, dan R & D*. Bandung: Alfabeta.
- Suryana, Y. & Bayu, K. (2013). *Kewirausahaan, pendekatan karakteristik wirausahawan sukses*. Jakarta: Kencana.

IMPROVING THE COMPETENCE OF VOCATIONAL HIGH SCHOOL GRADUATES BY TEACHING FACTORY AND TECHNOPARK

Sanatang

Electrical Engineering Education Department, Technical Faculty Makassar State University
email: sanatang.unm@gmail.com

ABSTRACT

For Improving competence of Vocational High Schools (SMK) graduates are implementation teaching factory and technopark at school, through teaching factory and technopark students can gain real learning experience in a real working world atmosphere. The program of Teaching Factory and technopark are the concept of learning in SMK based on production/services which refers to the standards and procedures that apply in the industry and implemented in an atmosphere like that occurred in the industry or workplace. Teaching Factory in SMK can be able to bridging the gap of competence between industry needs and competencies generated by the school. Teaching Factory implementation requires the involvement of the industry as an absolute relevant authorities assess the quality of vocational education outcomes. For planning, regulation, and implementation of Teaching Factory should be engage with local government, provincial, parents, and the community. One of the main objectives Teaching Factory and Technopark program at SMK are to improve the competence of vocational graduates that are relevant to the needs of the industry, so the impact on strengthening the competitiveness of industry in Indonesia, AEC, and even global. Competence produced by an integrative manner in the Teaching Factory is a comprehensive competence; includes expertise in the realm of psychomotor, affective/attitude, and the ability to think (cognitive) "Higher-Order Thinking Skills" (HOTS) capable of thinking critically and solve problems (critical thinking, evaluation, and problem solving); so that, it has a competitive competence of competitiveness in the world of work at global and ASEAN Economic Community (AEC).

Keywords: competence of graduates, teaching factory, technopark

I. INTRODUCTION

Improvement of Human Resources (HR) quality is a crucial issue today, because of the ASEAN Economic Community (AEC) came into effect in 2015 ago make the countries of South East Asia will be integrated freely in various of fields, namely economic (markets, product, investment, trade, etc.); social, science and technology, culture, and employment. Open access and employment opportunities between countries in various fields demanding increased quality of human resources to be able to fill labor needs in various fields, for example: industry, tourism, trade, employment and other countries AEC members. If education in Indonesia in general and specially vocational education are not able to produce skilled workers or professionals, the human resources of Indonesia will be coolies in their own country, unable to compete with foreign workers who have professional competence, and finally Indonesia will be filled personnel foreigners from different countries AEC members are more skilled and professional. Educational

system in Indonesia continues to be driven in order to produce the human resource competency highly competitive in the global world. Government made the regulation of competency standards specified in Government Regulation No. 19 of 2005 on National Education Standards (SNP) in clause 1 point 4, which reads "The standard of competence of graduates are qualified graduate capabilities that include attitudes, knowledge and skills". Faced with the development of science and technology in an era of global education, one of the educational institutions that Vocational High School (SMK) demanded anticipatory to prepare a workforce that can compete in the future, competencies possessed by the needs of the workplace (demand driven) Expected able to overcome the problems faced in life. The Delor Report based its proposals and education reforms on two principles: the four pillars of education (learning to know, to do, to be, to live together); and learning throughout life. This is an integrated vision of education: open to the many facets of life, encompassing education

from childhood to the end of life, and promoting interaction between various fields of knowledge. Emphasis is placed on learning rather than teaching, on the need to build on a person's previous knowledge, regardless of age or place of learning, and on forging new alliances to create genuine learning societies (UNESCO, 1996).

Graduates of vocational education are at stake their readiness in the international arena of labor at regional and global levels, both in the context of the China-Asean Free Trade Agreement (C AFTA) and the ASEAN Free Labor Agreement (AFLA), and demands the use of technology based on the new findings for efficiency renewable production requires its competence in according to the demands of the 21st century workforce competencies. In the case of employment we should considering the human resources will not be able to compete with workers from other countries who had prepared and have a better quality. According to reports from the UNDP in 2015, seen from the Human Development Index (HDI)), Indonesia was ranked 111 of 188 countries. It is under the neighboring states such as Singapore ranked 11th, Malaysia ranked 62nd.

Thailand ranked 93, and the Philippines ranked 115th. The Central Bureau of Statistics (BPS) concerning Unemployment Rate (TPT) in Indonesia shows that in the last 3 years the unemployment rates every level of education changes every year. Based on data from the month of August 2015 a total of TPT as many as 7,560,822 people, TPT SMK are second

ranked which are 1,569,690 peoples below the rate of high school graduates TPT of 2,280,029 people. The third position is occupied by TPT of 1,373,919 junior high school graduates, elementary school graduates to four TPT 1,004,961, the five TPT of the University 653 586 and 251 586 at six is Diploma. This suggests that improving the quality of human resources in Indonesia should receive serious attention from various stakeholders such as government, community, and education.

Director of SMK development (2006: 3) said required human resources that have competitive and comparative advantage for the development of the industrial sector and the economic sector. That requires the professional workers, especially workers who are directly involved in the production process, self competence development today is not an alternative but it is a need. For example 21st Century Skills are a series of higher-order skills, abilities, and learning dispositions that have been identified as being required for success in 21st century society and workplaces by educators, business, leaders, academics, and governmental agencies. This is part of a growing international movement focusing on the skills required for students to master in preparation for success in a rapidly changing, digital society. According to Trilling & Fadel (2009) in his book "21st Century Skills" framework for 21st century learning is shown in the following figure:

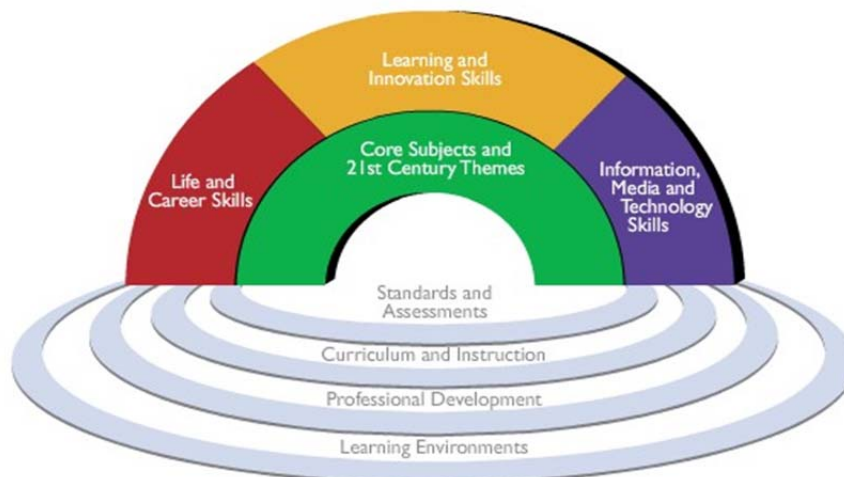


Fig. 1. framework for 21st century learning (Trilling & Fadel ,2009)

Figure 1 shows that education in the 21st century will be dominated by education of Information and Communication Technologies (ICT). Core competencies such as reading, writing, and arithmetic are acquired during the study will be the basis of other competencies. The skills have been grouped into three main areas: (1) Learning and innovation skills: critical thinking and problem solving, communications and collaboration, creativity and innovation. (2) Digital literacy skills: information literacy, media literacy, Information and communication technologies (ICT) literacy, and (3) Career and life skills: flexibility and adaptability, initiative and self-direction, social and cross-cultural interaction, productivity and accountability. The first two skills in this set, critical thinking and problem solving, and communication and collaboration, are the key learning and knowledge work skills that address these new work skill demands.

Human Resources Development (HRD) is one of priority concern of The Government of Indonesia as well as The Parliament. The Government gradually increases the budget for HRD up-to 20 percent of The National Budget. Specialty vocational education for example; through the Presidential Regulation number 41 in 2015 concerning the development Resource Industry has launched a Teaching Factory and Technopark programs in SMK. Other systems with particular attention to the increase of budget for teacher training (to increase the competence of teachers) and the budget allocation for the purchase and renewal of equipment, incorporate entrepreneurship subjects in the curriculum, providing funding through teaching factory and techopark. In 2016, Joko Widodo-Jusuf Kalla will establish 100 Technopark at SMK throughout Indonesia. The government's efforts have yielded disappointing results turned out as expected, because the reality in the field that not all programs are able to transform the performance of SMK including outcomes. Various constraints faced in managing teaching factory and technopark SMK: Management, infrastructure, financing, human resources, product quality assurance, collaboration industry/other institutions,

curriculum, and marketing as a whole performed by the school community (principals, teachers, staff, and students); without any direct engagement party industry and workplace; and lack of government supervision.

Increasingly intense competition in getting current job is a major challenge for graduates of SMK. They are required to prepare the required competencies of the workforce and the industry. Based on that condition, the SMK should be prepared to fix themselves to the competence of graduates can be accepted and took part in the world of work and industry in the current global era. SMK should be have a productive and competitive outcomes, with the competency of a globally competitive, capable of independent of work with entrepreneurial spirit, so that they are not just as a job seeker, but they will create jobs. Entrepreneurial spirit through entrepreneurship subjects taught, and then can be applied through teaching factory and technopark in school. Observing the importance improving of human resources through teaching factory and technopark, be an interesting thing to study about the circumstances of the management model of teaching factory and technopark proper at SMK to be able realize the objectives of human resource development, and what competencies are to be generated from the empowerment teaching factory and technopark in the SMK in order to improving the quality of human resources in Indonesia to be globally competitive. With studies and exploration thorough and deep will be able to produce a conceptual framework the management model of teaching factory and technopark in SMK. By teaching factory and technopark with proper management will be able to produce human resources in accordance with the needs of global competency in the 21st century.

II. DISCUSSION

2.1. Teaching Factory and Technopark Concept in SMK

Teaching Factory and technopark integrate education and research activities with the activities like the production process in the industry to produce a superior product.

Teaching Factory basic conception is "Factory to Classroom" which aims to make the transfer in industrial production environments significantly into the practice room. The actual production process is needed to improve teaching competence-based real activity of industry practices on every day. Learning concept based on industry practice means that every product produced is something that is useful and economic value or marketability and accepted by the market. Program of teaching factory is a combination of learning that already exists is Competency Based Training (CBT) and Production Based Training (PBT). CBT is training that is designed to allow a learner to demonstrate their ability to do something.

In the sense, that a process of expertise or skills (life skills) designed and implemented based on the procedures and standards work that is actually to produce products that in accordance with the demands of the consumer market.

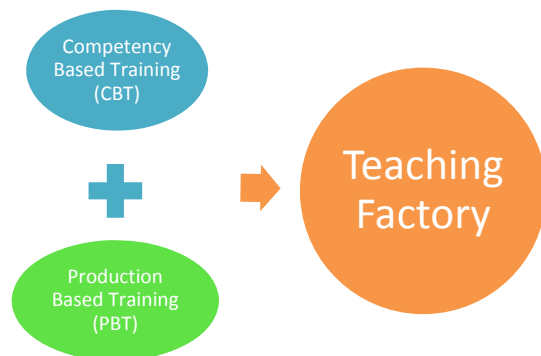


Fig. 2. The concept of learning through Teaching factory

Teaching Factory has a strategic value on education and vocational training to improve the competitiveness of graduates of vocational institutions such as vocational schools in the labor market locally and nationally and even regionally, because it has the mechanism that always follow the development of the industry very quickly. Having a learning concept based on industry (products and services) through synergies with industrial schools to produce graduates who are competent in accordance with market needs. Learning through teaching

factory is the process of mastery or skill carried out by standard procedures and actual work to produce a product or service booked by consumers. Teaching Factory is a learning process that combines theory and practice with real products that generate benefits for schools, students, teachers and local economic growth. Utilization teaching factory as a place of learning proposed by (Chryssolouris, 2015) shown in the following figure:

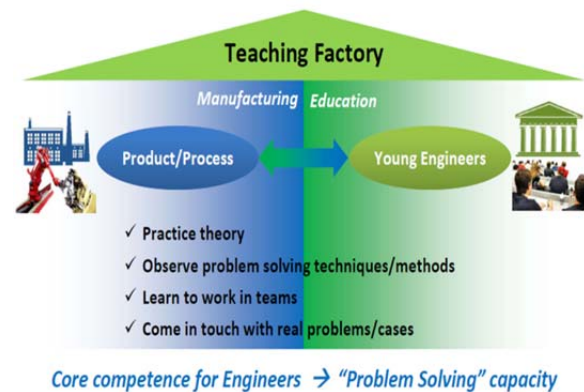


Fig. 3 The Teaching Factory Paradigm (Chryssolouris, 2015)

Teaching factory is a business unit that has a balance between the commercial aspects and aspects of academic, organized within the scope of school organization by utilizing the facilities of the school. Gains were used to help finance education and improve the welfare of the school community, including students and managers are concerned. In general, the teaching factory program at SMK is doing the product realization in learning, and the special purpose aims to: (1) to prepare vocational school graduates worker, (2) prepare vocational school graduates to continue learning to a higher level, (3) help students select areas of work according to their ability, (4) indicate that the 'learning by doing' is essential for effectiveness of education and grow a creativity, (5) defining the skills needed in the working world, (6) expand the scope of opportunities recruitment for the vocational school graduates, (7) to help vocational students in preparing themselves into the workforce, how to work together in the world of work that is actual, etc., (8) provide an opportunity for vocational school

students to practice skills so that they can make informed decisions about a career that will be chosen, (9) provide an opportunity for vocational school teachers insights to help instructional, (10) provide an opportunity for vocational teachers to build a 'bridge instructional' between classes with the world of work, (11) makes learning more interesting and motivating students.

To Support the existence of teaching factory at vocational high school, by built technopark will be a place (integrator) to connect between the Teaching Factory programs of SMK has been implemented with the industrial world. Technopark aims to stimulate and manage the relationship between knowledge and technology among program implementers Teaching Factory at SMK; facilitating the creation and growth of innovation-based industry support through business incubation and spin-off processes, and provide other value-added services increase, through the provision of space and supporting facilities of high quality.

Technopark has some facilities, including business incubators, angel capital, seed capital, venture capital. Stakeholders of a Technopark in SMK usually are government (usually the local government), the research community (academics), the business and financial community. Stakeholders are working together to integrate the use and utilization of commercial buildings, research facilities, conference center, up to the hotel. For local government, Technopark in vocational create jobs and increase local revenue. For workers whose income is high enough, Technopark at SMK has appeal because of the situation, location and lifestyle, try to combine ideas, innovation, and know-how of various implementers teaching factory at SMK and financial capacities (marketing) of the business world. It is expected from this merger can improve and accelerate product development and reduce the time required to move innovations into marketable products, with the hope to obtain a high economic return.

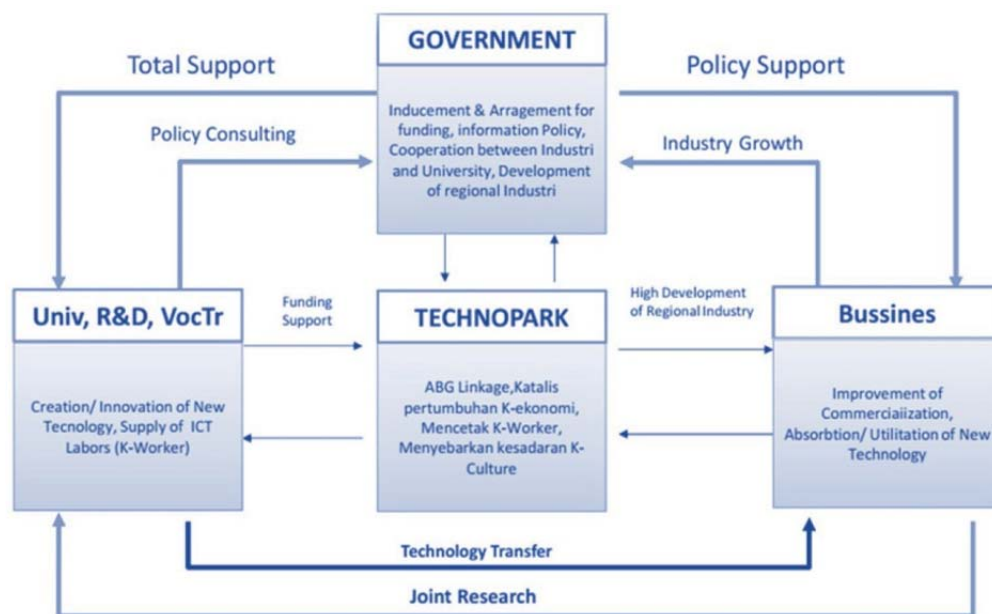


Fig. 4. Technopark Concept (Bappenas, 2015)

Technopark in SMK functioned mainly as a promotional spot for education which in this case is a Teaching Factory at SMK to promote the production of products and commercialization to be a bridge-products produced. This commercialization which includes business incubation, which is finalizing an innovation that has been

scientifically tested, so if it is produced to compete in the free market. In addition, other functions as a means to establish cooperation between universities or industry in order to produce or downstream innovations that have been produced by the college or will be mass produced by the industry.

The purpose of Technopark in SMK can generally be summarized as follows: (a) For the support of local economic potential in accordance with the needs of the industry, (b) As the "Think-tank" of product development and services SMK accordance with the needs of industry and local potential in particular, and globally in general, (c) As a "One-Stop-Solution" for the industry's need for human resources and innovation in the field of products and services. (d) As a "coordinator" of some vocational teaching factory, making it easier for the industry to reach its SMK with teaching factory, or otherwise, (e) Being a training center for vocational development teaching factory, (f) As a "display case" performance capabilities SMK as evidenced by the results of products and services, (g) Facilitating the incubator business (entrepreneurship) in collaboration with other agencies (vocational school, community, universities, industry, government) to develop the potential that suits your needs and around it area.

2.2. Teaching Factory and Technopark Models Development in Vocational High School

Developing the proper models for teaching factory vocational high school should take into account all relevant aspects. Models developed teaching factory is expected to be a forum for residents to learn entrepreneurship at school independently and generate entrepreneurial spirit and skills of students in order to become independent vocational high school outcomes. Some industry-based learning models in vocational high school (DitPSMK, 2015) as follows:

- a. Education learning model dual system: (1) vocational high school Applying curriculum synchronization with the industry, (2) Sending students to the practice of industrial work for 3 months to 1 year in the industry, sub-industry division and position relevant to the group's expertise student's choice, (4) competency test by industry and or certification bodies skills/professions. cooperation relationship can be seen in the Fig.5 below:

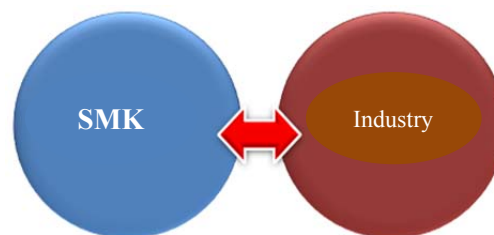


Fig. 5. Learning model dual system in vocational high school

- b. Teaching factory Learning Model in vocational high school established a business unit within the school where the business units in the form of cooperative /industry to support the learning process. The resulting product can be either goods or services. Students in this model as an employee doing work practices according to the package expertise guided by the teacher, as well as partner companies.

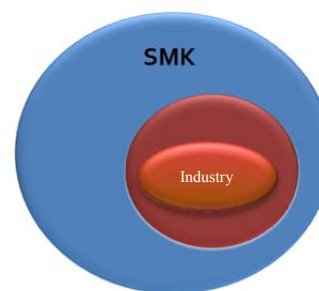


Fig. 6 Teaching factory learning model in SMK

- c. Teaching Industry Learning Model; vocational high school cooperate with industry in the provision of production, industry do the transfer knowledge to the vocational high school, vocational high school has a limited license to market and product cooperation results, Example: Kanzen-SMK, Zyrex-SMK, Advan-SMK, Focus-Esemka, as shown in fig. 7 below:

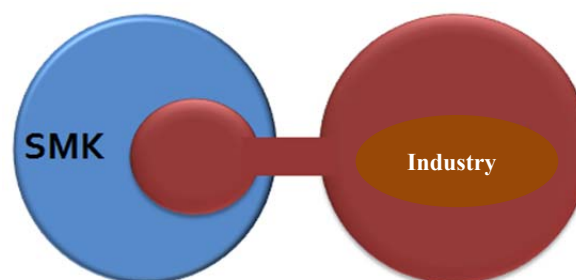


Fig. 7 Teaching industry learning model in SMK

2.3. The role and function of teaching factory and technopark for improving the competence of vocational school graduates

According to (Singh, 1998) the principle of school enterprises can be interpreted as serving a variety of economic, educational and social objectives. There are three main functions of teaching factory implementation at SMK as follows: (a) The Academic Functions include: The students learn directly as well as in industrial and developing himself, for example through; managerial ability, accounting, leadership, creativity, character formation, work culture, motivation, and work ethic. (b) Economic Functions include: become a business unit which is the source of funds for schools, into business units to improve the welfare of the school community; and provider of jobs for people in schools and surrounding communities. (c) Social functions include: Improve the performance of schools in the people so that will be the pride of the school community and Increasing public confidence, workplace, and industry on the quality of vocational school graduates.

Based on the explanation there are three fundamental things that become the primary function technopark and teaching factory at vocational high school are as a academic, economic, and social function. Teaching factory at vocational high school is the thing that distinguishes it from Junior High School (SMU), as an academic function technopark and teaching factory is expected to be a means of research and hands-on training for teachers and students in the business world in order to become independent and successful man. In technopark and teaching factory students can learn a lot of things they need for development for example through managerial ability, leadership, creativity, character formation, work culture, motivation, and work ethic. As the economic function of teaching factory and technopark as business units can be a source of funds for schools, and became a business unit. Profits used to help finance education and improve the welfare of the school community (headmaster, employees, teachers, and students). Technopark and teaching factory may improve the performance of SMK and appeal to the public so that the opportunity to develop SMK will be easily.

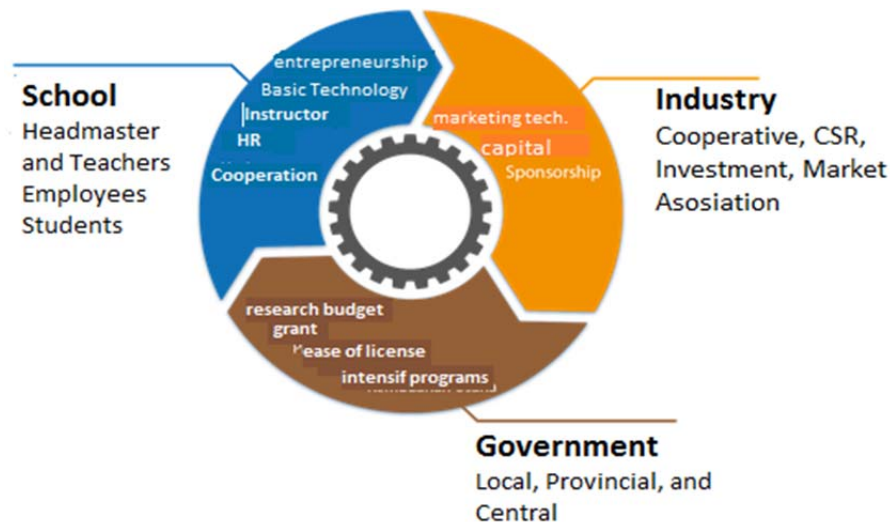


Fig. 8 Triple Helix of Teaching Factory and Technopark Implementation

The goal of the Technopark in vocational high school are to create a permanent link between school, industry/business/financial, and government. Technopark tried to combine ideas,

innovation, and know-how of vocational high school and financial ability (marketing) of the business world. It is expected from this merger can improve and accelerate product development and reduce the time required to

move innovations into marketable products. Technopark make their permanent link between SMK and industry, resulting in clustering and critical mass of researchers and companies. This makes the company become stronger. Collaboration pattern A-B-G (Academia-Business-Government) an optimum for Indonesia in the early stages triple helix is a model that puts the government as an element which has a dominant role. In this model, an initiative of scientists and researchers (bottom-up) received support from the government (top-down) to jointly hold the industry to develop new products are innovative. But then the government's role is expected to be reduced in line with the development of ICT Technopark.

Triple-Helix Model (Fig. 8) Innovations is introduced by Etzkowitz and Leydersdorff. This model emphasizes the role and the close relationship between the three actors, namely the government, industry and SMK. SMK position in Technopark can be a vocational technical leader in the implementation of the knowledge-based economy, while the NIS (National Innovation System) emphasized the importance of the company's role in innovation. Setting back relations ABG in Triple-Helix is the result of expectations on the level of communication and networking.

Relationships that appear in the Triple Helix, generally stems from efforts to solve problems and generate strategies when facing problems in innovation, rather than determined from a certain pattern. Through this interaction process changes will occur actors and the roles that they do. Thus, the pattern of triple-helix innovation is dynamic with the time change.

III. CONCLUSION

By implementing a teaching factory and technopark in SMK there are three main fields of competence that can be acquired by vocational school graduates are: Academic, Economic, and Social. Academic competence in the form of knowledge and skills are always up to date with the needs workplace and industry; motivation, managerial, and others. Competence of graduates in the field of economics that vocational school graduates will be able to improve their economic level

through independence in work or create their own jobs through entrepreneurship. Whereas social competence is when vocational school graduates have the knowledge and skills and adequate economic performance it is easy to get a place in society, wherever they are

REFERENCES

- Alptekin, S. e. (2001). *Teaching factory. American Society for Engineering Education Annual Conference and Exposition*. San Luis Obispo: Cal Poly.
- Arie Wibowo Kurniawan, dkk. (2016). *Grand Design Pengembangan Teaching Factory dan Technopark di SMK*. Jakarta: Dit.PSMK Kemendikbud.
- Arizona. (2003). *Work-Based Learning Resorce Gude*. West Jefferson Arizona State University: Lynne Bodman Hall.
- BPS Provinsi Sulawesi Selatan (2016); *Keadaan Ketenagakerjaan Sulawesi Selatan Februari 2016*. Berita Resmi Statistik No. 28/05/73/Th. X, 4 Mei 2016
- Chryssolouris, P. G. (2015). *The European Teaching Factory Paradigm*. University of Patras, Greece : Laboratory for Manufacturing Systems and Automation .
- Dadang Hidayat Martawijaya (2012); *Developing A Teaching Factory Learning Model To Improve Production Competencies Among Mechanical Engineering Students In A Vocational Senior High School*. Journal of Technical Education and Training (JTET), UTHM Malaysia
- Dit.PSMK. (2015). *Konsep Teaching Factory*. Jakarta: Kementerian Pendidikan dan Kebudayaan.
- Mourtzis, D., Chryssolouris, G., Mavrikios, D., & Papakostas, N. (Jun 2013). On industrial learning and training for the factories of the future: a conceptual, cognitive and technology framework. *Journal of Intelligent Manufacturing*, Vol. 24 Issue 3, p473-485. 13p. .
- PMPTK Depdiknas. (2007). *Pedoman Manajemen Teaching factory/Jasa sebagai Sumber Belajar Siswa dan Peggalian Dana Pendidikan Persekolahan*. Jakarta: Depdiknas.

- Rusnani. (2012). Pelaksanaan Teaching factory pada Sekolah Menengah Kejuruan Negeri kelompok Bisnis dan Manajemen. *Jurnal Pendidikan Vokasi*, 338-354.
- Sema E. A, Reza P. & Patricia M, (2001) *Teaching Factory* , Proceedings American Society for Engineering Education Annual Conference & Exposition
- Singh, M. (1998). *School Enterprises: Combining Vocational Learning with Production*. Germany: The International Project on Technical and Vocational Education (UNEVOC) - UNESCO.
- Sukardi. (2014). *Evaluasi Program Pendidikan dan Pelatihan*. Jakarta: PT. Bumi Aksara.
- Trilling, B., & Fadel, C. (2009). *21st Century Skills*. USA. USA: Jossey-Bass.
- UNESCO. (1996). *Learning: the Treasure Within, 1996. Report to UNESCO of the International Commission on Education for the Twenty-first Century*. The Australian National Commission for UNESCO: UNESCO.
- Wardiman Djojonegoro. (1998). *Pengembangan SDM melalui SMK*. Jakarta: PT. Jayakarta Agung Offset.

VOCATIONAL STUDENT'S SKILLS ENHANCEMENT THROUGH EMPOWERING LOCAL EXCELLENCE IN DEALING ASEAN ECONOMIC COMMUNITY (AEC)

Hendra Jaya¹⁾, Yasser A. Djawad¹⁾, Ilham Thaief²⁾

¹⁾Jurusan Elektronika FT UNM, ²⁾ Jurusan Ekonomi Koperasi FE UNM

email: hendra070982@gmail.com, yasserpdb@yahoo.com, ilhamthaief@yahoo.com

ABSTRACT

Education of local excellence is meant the process of education that exploit local advantages in the aspects of economy, arts and culture, human resources, languages, information and communication technology, ecology, and others that are beneficial to the development of competence of learners. Educational units of local excellence is a new paradigm of education to accelerate development in the region based on the potential of the local community. Thus, the district or school has enough authority to design and determine the things that will be taught. With the diversity of the potential of this area, the development potential and advantages of the region need to get special attention from the local government. In addition, the success of local excellence based school would be able to overcome the problem of urbanization, backwardness in science and technology. SMK present as: (1) an institution that is able to increase awareness and empathy of students to the problems of the people residing in the village Parambambe district Takalar, resulting in behavioral change in the behavior of students of vocational schools and communities in addressing the importance of skills in designing technology and business management to increase the value-added resource, which in turn can empower communities economically, so that the community is going to spearhead the production of bricks; (2) to overcome the problems faced by the people in the surrounding rural districts Parambambe Takalar through the application of TTG brick makers can improve their knowledge in making printing machine, fast and quality, as well as knowledge of entrepreneurship; (3) to overcome the problems faced by the community and around the village Parambambe Takalar district, through the knowledge in managing post-excavation soil bricks.

Keywords: local excellence, asean economic community, land management, business management

I. INTRODUCTION

Vocational high school (SMK) is a school that develop and sustain basic education and prepare learners to be able to work, either working alone or work as part of a group according their respective fields. Vocational schools (SMK) is an education at the secondary level that promotes the development of students' skills. Skills possessed is the result of learning in schools and in industry. Vocational schools have a primary mission to prepare students to enter the workforce. Thus the existence of CMS is expected to produce middle-level manpower are ready, in other words, CMS is required to produce graduates who are ready to work.

Job readiness vocational students is very important for vocational school graduates are ready workforce that will be

used in the workplace. The level of job readiness of students depends on how the student to prepare himself for the plunge into the world of work. Job readiness of students in the world of work depends on the aspect of competencies possessed by students and motivation of the students. The supporting factors that affect a student's readiness in facing the globalization of the world of work is the English language skills of the students and use of Information and Communication Technology (ICT), which is owned by the students. Therefore, vocational students must prepare themselves in the world of work meghadapi. Aspects of job readiness of students are legion, so in this study was limited to the readiness of student work from the aspect of competence, motivation of students, constraints and

efforts made in order to be ready to face the globalization of the world of work.

Globalization has become a major issue of the development and progress of the country. One association of countries considered is the ASEAN (Association of South East Asian Nations). The purpose of establishing ASEAN itself is contained in the Bangkok Declaration, namely to: (a) To accelerate economic growth, social progress and cultural development of the region; (b) Improve regional peace and stability; (c) Increase the active cooperation and mutual assistance in the economic, social, engineering, science and technology, and administration; (d) To maintain close cooperation and useful to a variety of international and regional organizations. One issue that is related to strategic implementation of the ASEAN Economic Community (AEC) which is implemented since 2015. AEC basically is an attempt to establish free trade among the countries of Southeast Asia, for example, import duties for goods and services will be deleted. This will affect the traffic flow of products from ASEAN countries, including in this case is labor. In the free market era of ASEAN in 2015, all ASEAN countries will compete for jobs that exist. Countries with high human resource competencies gets a chance superior economic gains in AEC.

Thus the vocational students are expected to have not only academic knowledge but also global knowledge as expected. One example is An Effort to Increase Productivity Through Custom Brick Application Technology and Business Management. Efforts were made include: 1) increasing awareness and empathy Vocational students to the problems of the people residing in the village Parambambe district Takalar, resulting in behavioral change in the behavior of the students and the community in addressing the importance of technology and business management to increase the value-added resources, which will empower economically, so that the community is going to spearhead the production of bricks in the face of global

competition AEC; 2) to overcome the problems faced by the people in the surrounding rural districts Parambambe Takalar through the application of TTG (appropriate technology) brick makers; 3) to enhance the knowledge and skills of vocational students in making printing machine, fast and quality, as well as knowledge of entrepreneurship.

Empowerment means craftsman brick amplifier Indonesian human resources will be the value and potential of local areas as a form of self-defense in receiving global flows. Thus increasing the skills of vocational students through empowerment of local advantages be one strategy in the ASEAN Economic Community (AEC).

1.1. Asean Economic Community Concept and Education Policy

MEA formation originated from ASEAN leaders agreed in Summit (KTT) in December 1997 in Kuala Lumpur, Malaysia. This agreement aims to improve the competitiveness of ASEAN as well as China and India could compete to attract foreign investment. Foreign capital is needed to boost employment and welfare of the people of ASEAN. At that time, ASEAN launched the initiative to form an ASEAN regional integration or community of ASEAN through the ASEAN Vision 2020 during the Second ASEAN Informal Summit. The initiative was later embodied in the form of long-term roadmap called the Hanoi Plan of Action agreed to in 1998. The purpose of the AEC to increase economic stability in the ASEAN region, and is expected to overcome the problems in the economic field between ASEAN countries. For nearly two decades, ASEAN consists of only five countries - Indonesia, Malaysia, Philippines, Singapore and Thailand are its founding in 1967. The countries of Southeast Asia who are members of a different time, namely Brunei Darussalam (1984), Vietnam (1995), Laos and Myanmar (1997), and Cambodia (1999).

Towards the AEC, the Indonesian government is expected to prepare a strategic step in the labor sector,

infrastructure, and industrial sectors. In the face of the AEC, the Indonesian government set up a policy response associated with the Industrial Development, Infrastructure Development, Logistics Development, Development, Investment and Trade Development (<http://fiskal.depkeu.go.id>). In addition to the respective ministries and institutions trying to anticipate the AEC with strategic measures. According Suroso (2015) in the field of education, the Government can also do curriculum development in accordance with the AEC. Education as a printer of human resources (HR) quality of the answer to the needs of human resources. Therefore, improving the school quality standard becomes imperative that graduates are ready to face competition. Dissemination activities the people should also be improved, for example with a Public Service Announcement about AEC trying to increase the readiness of people to deal with it. Education Minister Anies Baswedan said, raise the standard of quality of education one of them by reinforcing the educational actors, ie principals, teachers, and parents. According to him, the leadership of the principal to be the key growth ecosystem good education. Teachers also need to be trained in the proper methods, is to change the mindset of teachers. According Julipah (2015) in his paper on the ASEAN Economic Community (AEC) optimized approach that is able to face the challenges ahead AEC 2015, especially in the field of education, namely: education is the most important thing to improve the quality of community resources, especially in eastern Indonesia. In an effort to increase competitiveness by residents of foreign origin other countries, it is important for local and national governments to give more attention to the problem of education. Extension as a step to the intellectual life of the local community also needs to be done to provide the ease of managing the natural wealth of Indonesia's eastern region.

1.2. Vocational Students Skills

According to Nana Sudjana (1987: 68), skill is the pattern of activities that aim, which require manipulation and coordination of information learned. These skills can be divided into two categories, namely physical skills and intellectual skills. According Muhibin Shah (2006: 121), skills are activities associated with the nerves and muscles that typically appear in physical activity. Skills students, defined as the ability of a person to a matter that covers all tasks skills, attitudes, values and understanding that everything is considered as something penting untuk support its success in the completion of tasks.

Helen Connor, (2000: 42) states that the skills required by the labor of engineering are: (1) Have the skills specific techniques, (2) Proficient computer skills and informatics techniques, (3) Having a variety of applications skills (multi skilling), (4) Having the ability to adapt to new technologies quickly, (5) Grin and were able to add to his skills during his work, (6) Have the ability to communicate, (7) ability to work in a team (team working) and capable work personally, (8) Have the ability to organize and manage the management, (9) Knowing the laws and the environment, (10) ability to think globally. Meanwhile, According Anis Baswedan (2011) global competencies consist of: (1) World class skills, (2) Respect Diversity, and (3) Communication/language skills. Based on the description above it can be concluded that globalization is interconnectivity and interdependence between nations and people around the world, where between individuals, between groups and between countries interact with each other, dependent, related and influence each other that cross national boundaries.

II. RESULTS AND DISCUSSION

2.1. Role of Vocational Education

Vocational education has different characteristics with general education, both in terms of educational criteria, the substance of lessons, as well as

graduates. The criteria attached to the vocational education system by Finch and Crunkilton (1984: 12-13), among others (1) orientation of education and training; (2) the justification for the existence and legitimacy; (3) focus on the content of the curriculum; (4) the success criteria of learning; (5) sensitivity to the development of society; and (6) a cooperative relationship with the community. Nolker (1983), states that in choosing the substance of lessons, vocational education must always follow the development of science and technology, community needs, the needs of individuals, and employment. The government continues to encourage junior high school graduates to continue their education in vocational schools (SMK) in the hope that they can become a graduate skilled and ready to work. Skilled and productive graduates who are needed in the industrialized world who currently control the economic sector. It is inevitable that the industry excellence in a country is determined by the quality of skilled workers directly involved in the production process. Some of the reasons why the need for skilled labor as the support of industry excellence are: (1) skilled personnel are directly involved in the process of production of goods and services; (2) highly skilled personnel required to support the growth of industry in a country; (3) The global competition is growing increasingly tight and sharp, skilled labor is a factor of excellence to face global competition; (4) technological progress is an important factor in improving excellence, excellence factor is dependent on skilled labor to master and apply; (5) The person who has the skills have high chances to work and productive, the more a country has a highly skilled and productive, the stronger the economic development of the country concerned; and (6) a growing number of countries have unskilled labor, the more likelihood of unemployment would be an economic burden the country concerned (Djojonegoro, 1998).

The role of education in facing the coming of the AEC, it is expected. Either in

the form of formal education, non-formal and informal pendidikan especially in the sphere of vocational training. Due however to the AEC will give birth to the human impact Indonesia to pursue competence in the hope that the people of Indonesia can compete with ASEAN countries people who entered the free market AEC. Vocational education has a positive contribution to economic growth in Indonesia, namely through the human resources or the ability to produce a skilled workforce and productive according the demands of globalization. Vocational education can be interpreted as *keduniakerjaan* education. The world of work and employment change and evolve as a result of progress teknologi. Untuk can organize an effective vocational education to note the presence of several vocational education principles include: (a) The duties of the exercise performed by the way, the tools and the same engine as set forth in the workplace; (b) Students are trained in the habits of thought and work as required in the work itself; (c) The teacher has had a successful experience in the application of skills and knowledge in the operation and work processes to be performed; (d) Since the beginning of the exercise already habituation behavior that will be shown in its work; (e) The training given at a real job.

2.2. Local Excellence Empowerment Through SMK

Takalar is a district in the province of South Sulawesi, Indonesia. Its capital is located in the city of Takalar comprising eight districts, namely: Pattalassang, South Polombangkeng, North Polombangkeng, Galesong, South Galesong, North Galesong, Mappakasunggu, Manggarabombang. Geographically located at coordinates Situated on the west coast of South Sulawesi ±40 km from Makassar to City Center. Kabupaten Takalar has a strategic position in the trade of goods and services with the district boundaries are north to the city of Makassar and Gowa regency, east with Jenepono and Gowa regency, south, Flores Sea and the west by the Strait of Makassar.

This district has an area of 566.51 km² and a population of as much as ± 250,000 (www.takalar.go.id).

In 1998 due to the financial crisis that has implications also for agriculture due to increased fertilizer prices, some farmers use agricultural land / fields to be used as bricks. Due to the development needs in the Makassar city center increases, the most ordered bricks to Takalar. The increasing demand for demand for bricks, the other farmers in the village parambambe come into a brick craftsman giving good economic value, so that each village in the county Takalar started to develop this business.

The village farmers Parambambe district. South Galesong, Takalar, Prov. South Sulawesi who moonlighted as a brick craftsman made partner in science and technology activities. The average farmer in the village Parambambe has two plots of paddy field to place each other apart. The land area of paddy fields and dry land Parambambe village, 179.6 hectares of rice fields, rice area by type of irrigation and rainfed villages technically Parambambe 179.6 ha (BPS Takalar, 2007). In the planting season farmers doing work as a farmer, but in the season waiting for the crop farmers turn into a brick craftsman. Farmers who do not have land to make bricks to help other farmers with the wage system and for the results. From year to year since 2004 the farmers to use the land to be used as bricks which can then be distributed to cities as raw material for housing. Caused the number of housing developments in the city of Makassar, makes the need for increased and eventually many farmers are turning into a brick craftsman.

At the time of observation in January 2015 on a group of craftsmen obtained various problems as follows: (1) livelihoods are largely community Parambambe is making bricks, many rice fields that have been made of clay bricks, even if we see in this village almost the entire community dipekarangan the house is no place to make bricks; (2) Mechanical (method) of making bricks relatively slow, tractors are used only

for compacting materials (water + clay); (3) The tool used is still quite traditional tools; (4) This method of marketing is still low, due to the yet-based IT (Survey on Parambambe village, district. Takalar in January 2015).

Reality as stated, vocational institutions are expected to undertake training to improve the quality of brick production through the application of engineering technology and operate tools that can facilitate the conduct of brick-making and business management through community service program of the group of bricks in the district Takalar.

Based on identification of problems and potential brickyard in the village of the district Parambambe Takalar, can put forward proposals to settle matters of vocational students especially those in brick manufacture of printing machines and techniques to operate well, which is productive with good quality. The presence of this brick molding machine is possible to perform a much larger production and can reduce operating costs. Thereby increasing revenue brick craftsmen and acquire good management. Some activities related to the skills of vocational students are as follows: 1) The production of high quality bricks that can be marketed to consumers; 2) Design and Manufacture brick molding machine is fast and effective and improve the skills of bricklayers in operating the printing machine brick fast and qualified.

The target has been achieved in the implementation of this is as follows: (1) increase awareness and empathy Vocational students to the problems of the people residing in the village Parambambe district Takalar, resulting in behavioral change in the behavior of the students and the community in addressing the importance of technology and business management to increase the value-added resources power, which in turn can empower communities economically, so that the community is going to spearhead the production of bricks; (2) to overcome the problems faced by the people in the surrounding rural districts Parambambe

Takalar through the application of TTG (appropriate technology) brick makers; (3) to enhance the knowledge and skills of vocational students in making printing machine, fast and quality, as well as knowledge of entrepreneurship.

Evaluation and results achieved vocational students in this thesis are: (1) The interest and motivation of vocational students is quite high or very enthusiastic. The percentage of school attendance by an average of 80%. The presence of vocational students show their sincerity to be fostered. The spirit of cooperation within the group of vocational students this capital to make vocational students more advanced and creative; (2) Vocational students acquire knowledge about the techniques and scoring stone batamelalui print engine technology, marketing management, and fabrication shop on-line; (3) The participants acquire the knowledge and skills to use the equipment. During this community brick maker parambambe village still use traditional methods so that the productivity in terms of quantity, knowledge of marketing, and use of information technology for the marketing of brick craftsman members in terms of quantity and quality is still low.

Education of local excellence is done by exploiting local advantages in the aspects of economy, arts and culture, human resources, languages, information and communication technology, ecology, and others that are beneficial to the development of competence of learners that can be used for the competition locally, nationally, and globally. Educational units of local excellence is a new paradigm of education to accelerate development in the region based on the potential of the local community. Thus, the district or school has enough authority to design and determine the things that will be taught. Each region has the potential advantages of the area that needs to be developed better. With the diversity of the potential of this area, the development potential and advantages of the region need

to get special attention from the local government so that the younger generation of the region is no stranger to its own affairs and understand very well about the potential and the values and culture of the region itself, so that they can develop and strengthen regional potential in accordance with the demands of the economy and employment. In addition, the success of local excellence based school would be able to overcome the problem of urbanization, unemployment and backwardness in science and technology.

2.3. Government Policies to Increase Competitiveness in the Face of Labor Vocational AEC

Within the framework of the ASEAN Economic Community (AEC), low competitiveness of Indonesian workers is precisely the threat that harm Indonesia. This is because the freedom of mobility of factors of production (capital and labor) is required in the AEC. In other words, if you can not compete, Indonesia will only be a market for the major countries of ASEAN, especially in the context of the free flow of skilled labor/professional (free flow of skilled labor).

Improving the competitiveness of Indonesian workers in terms of education in the framework of the ASEAN Economic Community has been done through the policy of the relevant ministries. The Ministry of Manpower and Transmigration of Indonesia and the National Chamber of Commerce has signed a Memorandum of Understanding (MoU) has set some policies in order to increase competitiveness. It is stated in them are: (a) Improving the quality of the workforce through education and training system development based on competency. An example is implemented by forming the Professional Certification Institute under the auspices of the associations profession; (b) In a competency-based system, there are three interrelated components namely competency standards, competency-based training and certification of competencies. Examples are implemented

by linking vocational education curriculum policy nurse (SMK, Diploma), professional certification agency (Ministry of Health), and organizing certification in Indonesia.

Based on BPS data earlier, the Indonesian human resources yet able to face the AEC era for nearly 50 percent of the local workforce any graduates of Elementary School. College graduates are also only about 10 gratuity. The policy of the Ministry of Education and Culture, through the Head of Professional Development of Education, namely: (a) Develop curriculum 2013 to address HR issues in the face of industry and the free market. This curriculum contains many changes and emphasis on skill, knowledge, and attitude from basic education to upper secondary education; (b) Curriculum 2013 is directed at a specific orientation skills; (c) Focusing on the curriculum in higher education and competency-based international certification ; and (d) mastery of soft skills and English.

III. CONCLUSION

The ASEAN Economic Community (AEC) can be a scary thing for some circles, one in the field of education. Indonesia is required to improve the quality of human resources that have integrity and a strong identity as a nation of Indonesia. Indonesia is a nation that has diverse potential. This potential should continue to be preserved and strengthened through the use of local potentials in the area. One way is to increase productivity of craftsmen Bricks Through Technology Applications and Business Management. SMK Present as: (1) an institution that is able to increase awareness and empathy of students to the problems of the people residing in the village Parambambe district Takalar, resulting in behavioral change in the behavior of students of vocational schools and community in addressing the importance of skills in design technology and business management to increase the value-added resources, which in turn can empower communities economically, so that the community is going to spearhead the

production of bricks; (2) to overcome the problems faced by the people in the surrounding rural districts Parambambe Takalar through the application of TTG (appropriate technology) brick makers can improve their knowledge in making printing machine, fast and quality, as well as knowledge of entrepreneurship; (3) to overcome the problems faced by the community and around the village Parambambe Takalar district, through the knowledge in managing post-excavation soil bricks.

Development potential of the local area is one of the proven strategies in the face of the AEC. With the implementation of the AEC, through the utilization of local potential, the Indonesian people can transform challenges into opportunities. The negative impact of AEC can be turned into a positive is even more a nation of Indonesia is strong, firm and steadfast. The implementation of the training skills of vocational students as a strategic step to face the AEC, still need to continue to be improved and developed. The lack of evaluation of the improvement of skills into something that must be considered. Evaluation of skills training for potential development of local areas tailored to global developments.

REFERENCES

- M. Ari Sabilah Rahman. 2015. Daya Saing Tenaga Kerja Indonesia Dalam Menghadapi Masyarakat Ekonomi Asean (MEA). *eJournal Ilmu Hubungan Internasional*, 2015, 3 (1): 117-130. ISSN 0000-0000, ejournal.hi.fisip-unmul.org
- Anis Baswedan (2011) yang termuat dalam [p://policy.paramadina.ac.id/v2/?p=484](http://policy.paramadina.ac.id/v2/?p=484)
- Abun. 2007. *Intensifikasi ayam kampung pada lokasi kolam jaring apung melalui teknik formulasi dan produksi pakan berbasis muatan lokal*. Laporan pelaksanaan kegiatan pengabdian

- kepada masyarakat. Fakultas peternakan Universitas Padjadjaran
- Arif Bintoro Johan. 2008. Peran Pendidikan Kejuruan dalam Menghadapi Masyarakat Ekonomi ASEAN (MEA) FKIP Universitas Sarjanawiyata Tamansiswa.
- Burhanuddin. 2013. *Studi Penyimpangan Ukuran Batu Bata Merah*. Jurnal Teknosains, Volume 7 Nomor 2, Juli 2013, hlm: 231-236
- Dessler, G., Griffiths, J & Llyod-Walker, B. 2004. *Human Resource Management (2nd Edition)*. Pearson: Australia
- Dini Amaliah. 2015. Pengembangan Muatan Lokal Sebagai Salah Satu Strategi Menghadapi Masyarakat Ekonomi Asean (MEA). Universitas Indraprasta PGRI Jakarta. Prosiding Seminar Nasional 9 Mei 2015. Hal 419-429
- Finch, C.R., & Crunkilton, J.R. (1984). *Curriculum development in vocational and technical education (3rd ed)*. Needman Heights: Allyn and Bacon, Inc.
- Miftakhul Huda. 2012. *Pengaruh Temperatur Pembakaran Dan Penambahan Abu Terhadap Kualitas Batu Bata*. Jurnal Neutrino Vol.4, No. 2 April 2012
- Rahmat Hidayat,dkk. 2014. *Model Reklamasi Lahan Kritis Pada Area Bekas Penggalian Batu Bata*. Jurusan Pengelolaan Hutan dan Konservasi Sumberdaya Hutan Fakultas Kehutanan, Universitas Gajah Mada,Yogyakarta
- Muhibbin, Syah. (2006). *Psikologi pendidikan dengan pendekatan baru*. Bandung: Rosda Karya.
- Oscar Fithrah Nur. 2008. *Analisa Sifat Fisis Dan Mekanis Batu Bata Berdasarkan Sumber Lokasi Dan Posisi Batu Bata Dalam Proses Pembakaran*. Jurnal Rekayasa Sipil, VOLUME 4 NO. 2, OKTOBER 2008
- <http://www.organisasi.org/1970/01/daftar-nama-kecamatan-kelurahan-desa-kodepos-di-kota-kabupaten-takalar-sulawesi-selatan.html>

BIG BANG MODEL STRATEGY FOR ACCELERATION OF LOCAL GOVERNMENT READINESS FINANCIAL ACCOUNTING SYSTEM BASED ACCRUAL IN THE DISTRICT KARANGANYAR

Siti Nurlaela¹, Sri Hartono², Istiqomah³
Economics Faculty of Islamic Batik University Surakarta
rmail: dra_nurlalela@yahoo.com

ABSTRACT

This study aims to accelerate the development of accrual accounting and the suitability of accrual accounting in the public sector. This study was to determine the development of accrual accounting, accrual accounting is a concept that is better than the cash basis, accrual accounting but still requires fundamental improvements to suit the characteristics of the public sector. The adoption of accrual accounting is at great risk and thus requires good planning to avoid failure. Research Model Big Bang Local Government Readiness Acceleration Strategy Against Accrual Based Accounting System In Karanganyar provide solutions and accelerate efforts to avoid failure to success in the use of area-based accounting system accrual solutions that can help solve the problems faced. Research models of the Big Bang strategy accelerated efforts to address changes in regulatory rules are relatively short, the process of information dissemination and outreach to slow, the complexity of the local financial statements on an accrual basis, and the absence of accrual-based accounting system in full is the obstacles encountered in the implementation of the accrual basis. Research Strategy acceleration performed at Karanganyar. District Government to improve unqualified opinion after local government financial accounting system based on accrual enforced. Research stages first year (2016) Improving the capacity of human resources who master the field of accounting to be placed on the right post. Regeneration of human resources who have the competencies of accounting that will be placed in each of the local government unit.

Keywords: big bang model, financial accounting system, accrual based accounting

I. INTRODUCTION

The development of accrual accounting and the suitability of accrual accounting in the public sector, the phenomenon of the adoption of accrual accounting by public sector around the world have been going for 20 (twenty) years. Researchers used the data collection techniques in the form of research Determine the development of accrual accounting, debate the arguments of supporters and opponents accrual accounting and accrual accounting issues. This study shows that Accrual accounting is a concept that is better than the cash basis, accrual accounting but still requires fundamental improvements to suit the characteristics the public sector. The adoption of accrual accounting is at great risk and tuse. Require good planning to avoid failure. Reform of the public sector is not only Occurs in developed countries, but some developing countries and disadvantaged actively on-going reforms of

public institutions. One public sector reform movement the most popular is the concept of New Public Management abbreviated NPM. The private sector, accounting has a very important role. Accounting is role to generate the resources which are then used to process of economic decision making better. The resulting accounting information is a tool to measure the extent of the efficiency do and as tool accountability. Government Regulation No. 71/2010 as a follow-up of Law number: 17/2003, use of accrual basis has been initiated in the 2013 budget by the central government. It is expected including all government organizations, local government, already implementing the Government Accrual Based Accounting (APBA) no later than the end of 2015. Changes in accounting basis from cash basis into the base Accrual is expected to provide the benefits associated with the determination information cost savings program in order (cost saving) as

well as information on assets so as to provide accurate information related to the Increase in revenue (revenue generating). Accrual accounting is expected to improve accountability, continuity, providing a basis to better measurements related to the impact of the government policy, improve efficiency and organizational effectiveness and encourage improving the integrity.

Adhikari and Malefic F (2011: 136) describes the failure of the application accrual accounting in Nepal due to the inability of international institutions in the generally low level of human resource capacity and lack of motivation of government. Government's lack of motivation for the adoption of accrual accounting is not based on his own wishes but the imposition of international organizes. Efforts are proposed Competitive Research Grant entitled "Big Bang Model Readiness Acceleration Strategy against Local Government Accounting Accrual Based Financial System in Karanganyar". Solution that can help overcome the problems faced. The research in this study a models of the Big Bang strategy of accelerated efforts to address changes in regulatory rules relative briefly, the process of information dissemination and outreach to slow, the complexity of the report financial accrual basis, and the absence of accrual-based accounting full system constitute obstacles encountered in the implementation of the accrual basis. Research the strategy carried out in Karanganyar District Government in increase of unqualified opinion after local government financial accounting system based apply accrual basis. Problems in this study based on the following background: 1) How pprepared aagainst Local Government Financial Accrual-based Accounting System in Karanganyar? (2) How the big bang model local government readiness acceleration strategy against accrual based accounting system can improve unqualified opinion in district Karanganyar?

Objective of general purpose are: 1) Competitive Research Grant is to produce the innovation and development of science and technology applied research that can be utilized by the regional government and community or industry. (2) Financial reform

countries and regions that is important in increasing accountability, efficiency and performance of the government. 3) Accrual accounting strategy of the government, improve the quality of decisions and Allows effective supervision. The specific objectives of this research are: 1) research stages first year (2016): design and prototype big bang model readiness acceleration strategy against local government system accrual-based regional financial accounting. (2) Increase the capacity of human resources who master the accounting field to be placed on the right post. 3) regeneration of human resources who have the competencies of accounting that will place in the respective local government financial management unit.

Research grants competition is a development on the research that has been done by DeLone and McLean Referring Livari research (2005) Accounting information in the domain of public sector projects in Indonesia. Power and Laughlin (1992) is the change in the public sector accounting. The introduction of accrual accounting system that is regarded as more technology both aimed at facilitating greater transparency in the activities of the institution of public services, to strengthen government accountability and to improve the quality of decision making in government. Mc Cullon and Ball (1992) doing research in New Zealand, New Zealand is one country that is the most successful in implementing accrual accounting system in the public sector. The rate of change (the degree of change) in public sector management in Argentina New traversed quickly intervening and very innovative. Reforming government in almost all aspects of governance, ranging from the executive (the officials of financial managers and accountants state), the system used, to the culture that is held in each institution countries, as outlined in the Public Finance Act 1989. Humphrey et. al.(1993) in English. Khumawala (1997) conducted a study of reforms in India, while Chan (1994) explored the implementation of accrual accounting in the United States. According to research Yamamoto (1999) that the introduction of the accounting reform is not an end, but it depends on the level of understanding users and their contributions to making better

decisions, between a larger change in the sector and in public accounting techniques, it is very important to (a) pay attention to changes where political and economic changes that occurred report, and (b) to estimate the impact of the interchangeability of the practice and performance management of public service. Ryan and Christensen, 2002 the change from cash-based accounting system or budget-based accounting to accrual accounting system is a significant element in public sector reform. McKendrick (2007: 2) explains accrual accounting that has spread to many countries along with the development of New Public Management. This matter is part of the adoption process and the form of private management techniques to the management of the public sector. Khan and Meyer (2009) Based Government Accounting accrual can be one contributing factor in generating behavior change decision makers. However, a variety of positive benefits gained from implementation of the APBA can be achieved only reviews those changes include various other aspects also including accrual budgeting.

Asian Development Bank (in Widjajarso) provide implementation of the state budget, as follows: 1) Precautions for selecting implementation strategies; There are two play models in the application of the accrual direct models (big bang) and the models of gradual (gradual). Big bang approach models made within a very short time. The advantage of this approach is to support the change of organizational culture, fast and can avoid the risk of interest, but Contain weaknesses, such as high workload, lack of time to resolve outstanding issues, and the political commitment that might change. Examples of successful implementation in New Zealand is the which supported three factors namely the existence of a fiscal crisis, the support of politicians and their bureaucratic reform that provides the flexibility to Human Resources. Alternative involving a phased approach, such as the implementation in the United States federal government, 2) the political commitment is one of the key; the political commitment in the implementation of the accrual basis for developing countries to be

essential, so that political commitment is needed to eliminate reviews their interests are not aligned. 3) The aim should be communicated; the results and benefits to be achieved with the adoption of the accrual basis of intense should be communicated to the parties concerned. 4) The need for a reliable staff accountant; professional accountants will be indispensable supported recruitment patterns are appropriate and sufficient training. 5) The accounting information system should be adequate; Cash-based accounting information is an important point in a change to the accrual basis. If a country has not had a cash-based accounting system that is reliable, then the country must first concentrate on improving existing systems and processes, before considering the shift to accrual accounting. 6) supreme audit agency should have the right resources; Audit Firm holds a very important key in implementing accrual basis either as a partner or as a reviewer of the implementation process and the results to be .7) Implementation of the accrual basis should be part of bureaucratic reform; The application of the accrual basis should not only be seen as a matter of accounting techniques, but this implementation requires changes in organizational culture and must be part of the reform of the bureaucracy as a whole. Based on accounting information systems accrual regulation of Minister of the Interior of the Republic of Indonesia number 64 year 2013 on the application of the government accounting standards accrual based local of government. Implementation of the government accounting standards accrual based on local government. Local government is the provincial government and district government/municipal. The Government Accounting Standards Accrual Based is recognizing revenue, expenses, assets, debt, and equity in the accrual-based financial reporting, as well as recognizing revenue, expenditure and financing of budget execution reporting nature on the basis set out in the local budget.

II. METHODS

The variables in this study were classified into exogenous and endogenous variables. Exogenous variables consist of

quality systems and quality of information, whereas endogenous variables consists of the satisfaction of users of information systems, the intensity of the use of information systems, individual impact, and organizational impact.

Quality system means the quality of the combination of hardware and software in information systems accrual-based accounting and the focus is on the performance of the system. The indicator used is 6 adapted from Bailey and Pearson (1983), ie the system's flexibility, system integration, response time/change, convenience of access and language. The variables in this study were classified into exogenous and endogenous variables. Exogenous variables consist of quality systems and quality of information, where endogenous variables consists of the satisfaction of users of information systems, the intensity of the use of information systems, individual impact, and organizational impact.

Information quality refers to the output of the system information, concerning the value, benefits, relevance and urgency of the information produced (Pitt and Watson, 1997). Reviews these variables describe the quality of information that is perceived by users as measured by six indicators used Bailey and Pearson (1983) items, namely the completeness, accuracy, accuracy, reliable, present and shape from the outside. Research Grants competition is a development on the research that has been done by De Lone and research Livery Referring McLean (2005). Accounting information in the domain of public sector projects in Indonesia, research testing the D & M IS Success Model Big Bang is the strategy will be developed to the regional financial information system user both at the level of the local government unit in Karanganyar. Operational definitions research variables operational definitions and indicators for each variable described in Table 1.

Table 1. Operational definitions and indicators each variable

Variable	Operational definition	Indicators
X1 = Quality Systems	The compliance with customer specifications	1. Ease of use 2. Reliability 3. Response Time 4. Integrated 5. Accessibility
X2 = Quality Information	To support	1. Complete decision-making 2. Accurate 3. Reliable 4. Timely 5. Relevan
X3 = Quality of Service	Submission services	1. Tangibel 2. Reliability 3. Responsiveness 4. Assurance 5. Empathy
X4 = Motivation Management	dynamic condition requiring employees to work and perform tasks	1. Physiological employees in the workplace 2. Security duties 3. Flocking 4. Award 5. Self-actualization
Y1= User Satisfaction	Level	1. Satisfaction someone feeling thoroughly after doing work on the quality of the system product performance (results) were thoroughly. 2. Satisfaction felt with his expectations. the quality of information 3. The overall satisfaction Service quality
Y2 = Benefits System for Organisation	The management objective of Local Government Finance	1. Efficient 2. Effective 3. Accountable

Tecnical analysis of the data to determine the effect of variables were observed in this study is the effect of quality

systems, information quality, service quality and motivation management of the user satisfaction regional financial information system in Karanganyar and to determine the influence of quality systems, information quality, service quality, motivation management and user satisfaction the advantage/benefit regional financial information system Karanganyar district county government is to use the analysis Partial Least Square (PLS). Technical analysis of Partial Least Square (PLS) was chosen because in addition to confirm the theory, PLS can also be used to explain the relationship between the presence or latent variables. The steps taken in the data analysis (Ghozali, 2015: 1) designing structural models (inner model) make a structural model of the which functions links between latent variables based on the formulation of the problem or hypothesis penelitian, 2) designing a measurement model (outer model), make function measurement models defines how each block indicator associated with latent variables. 3) Constructing the path diagram. Structural equation model that shows the relationship of variables with other variables. Convert path diagram into a system of equations Path diagram analysis of the effectiveness of regional finance information system that has been prepared further converted into a system of equations items.

III. RESULT AND DISCUSSION

Description of research, results number of questionnaires distributed a total of 120 in 60 local government unit in Karanganyar district government taken two respondents to answer a questionnaire prepared statement, the number of questionnaires returned 120 questionnaires. The collection of data is through interviews and focus group discussions. Questionnaire data were analyzed as follows Table 1.

Based on demographics data is used to determine a general overview of the financial manager of the district government financial Karanganyar. Demography business in this research includes gender, age, and education. gender financier viewed from gender, the data indicate 120 finance manager, are men

and the remaining 63.33% women 36.66%. finance manager with the male gender is more dominant than the female as presented in Table 2.

Table 2. Questionnaires Respondents

NO	Number of People	%
Women	44	36.67
Male	76	63.33
Total	120	100

Characteristics of financial management by gender in Karanganyar regency administration is dominated by men is as much as 63.33 percent while the finance manager with the female gender as much as 36,67%, appointment of financial management officer is still dominated by an employee that the male sex.

Table3. Demographics gender 2016

No	Description	Amount Questionnaire
1	Total of questionnaires distributed	120
2	questionnaire that was filled	120
3	questionnaires decent processed	120
4	Response Rate	120

Source: Local Government Karanganyar 2016.

Financial management in terms of age, finance manager is in the range of 35 years and above, classified into five age groups as presented in table 3 data show finance manager in the respective sectors in the Local Government Karanganyar were more likely to be in the age group over 45 years and the most are in the age group above 50 years.

Table 4. Frequency distribution of local government financial management SKPD Karanganyar 2016

No	Age	Number of people	%
1	< 35	5	54,16
2	35-39	11	9,17
3	40-44	8	6,1
4	45-49	35	29,14
5	50 +	61	5,43
Total		120	100

Source: Local Government Karanganyar 2016.

Characteristics of financial management by the financial age if that business is in each local government unit in Karanganyar dominated by financial managers who are at the age of 45 years and older. Age in each local government unit of financial managers in the Karanganyar 51.43% over the age of 50 years, 29.14% are in the age range of 45-49 years old and the rest are under 45 years. Appointment of financial management in the respective local government unit attached with structural positions, which to be promoted in structural positions seen from class/rank employees in accordance with applicable regulations.

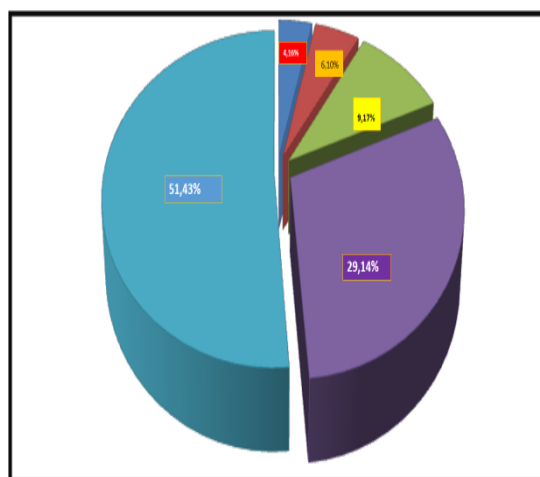


Fig. 1: Characteristics Age business sectors in the Financial District Government Karanganyar 2016

Human resources finance management local government unit S1 and S2, and the overall business education qualifications in the field of local government units of local government finance in Karanganyar is already relatively high. Qualifications education human resources manages the local government unit Fig. 1 in Karanganyar amounted to 49.26% S1/D4, 35.74% educated S2 and the rest of the D3 as much as 10% and 5% of high school education. The human resources of the financial sector in the local government unit Karanganyar district has an educational background in economics as much as 54%, spread out in the local government unit respectively only 18.7% of the area of financial management unit. This means that human resources for financial management units in each local

government unit who has a background in economics education is not optimal.

Table 4. Education Local Government Financial Management Karanganyar

Education	Number of People	%
SMA	6	5
D III	12	10
S1/D4	59	49,26
S2	43	35,74
S3	0	0
Total	120	100

Source: Local Government Karanganyar 2016.

Applying effect of the government accounting standards accrual based on the quality of local government finance report Karanganyar (X1)

The results show the application of accrual based government accounting standards hypothesis accrual based positive and significant impact on the quality local government finance report Karanganyar regency to see a regression coefficient of 0308. This means understanding and application of accrual based accounting standards in government finance and in the preparation human resources maker local government finance report determining the quality of Karanganyar. Based on the frequency distribution of that indicator from the application of accrual based government accounting standards (accountability, management, transparency, balance between the generation and evaluation of performance) had an average score above 4. This indicates that the application of accrual based accounting standards governments have a positive influence and is believed to improve the quality of local government finance report Karanganyar so as to achieve a better opinion than in previous years of the audit board of Indonesia. Government accounting standards is said to have an influence on the quality of the financial statements for the accounting standards already contained complete components that must be present in the financial statements. If the government of accrual based accounting standards applies equally well and always used the reference in the preparation of financial statements of the local government will have the quality of

financial reporting information that is good and true. With the creation of financial statements properly then it will manifest good governance and authoritative. Accrual-based government accounting standards is the accounting principles set forth in preparing and presenting the financial statements of the government. The purpose of reviews these so imposed its financial statements produced can improve the quality of financial statements of central and local government. With the implementation of the government accounting standards based accrual good, local governments will have a better quality of information, because local government finance report must correspond to accrual-based government accounting standards.

Human resource competency influence on the quality local government finance report Karanganyar (X2)

Hypothesis testing results show that the competence of human resources and a significant positive effect on the quality local government finance report Karanganyar regency with regression coefficient 0151. Reviews these results indicate that the competence of the human resources represented by the respondent determines the quality of the resulting the local government finance report Karanganyar that will affect the provision of opinions by the supreme audit agency Republic Indonesia. Based on the results of the frequency distribution of most of the indicators of human resources competence (educational background, understanding of regulations and standards, training and technical assistance, as well as working experience) had an average score above 4. This indicates that the competence of human resources to improve the quality of local government finance report Karanganyar own level tall one. Unlike the case with other indicators (interaction with the system) has the average score below 4. This indicates that the competence of human resources in terms of interacting with the system is not optimal in improving the quality local government finance report karanganyar arranged.

Effect of utilization financial management information system local government finance report regions on the quality of Karanganyar (X3)

The results of this study indicate that the use of management information systems keuangan area has positive and significant impact on improving the quality of local government finance report Karanganyar with regression coefficient 0,339. This means reviews their quality improvement efforts local government financial statements through the utilization of the regional financial management information system. In other words, the quality of financial reports generated greatly aided by the system information held in the financial management and reporting/preparation of financial statements. This was evident from the indicators of utilization of information systems management finance regions (advancement of information communication, reviews their rapidly developing web and internet technologies, changes in the reporting system, adequate infrastructure and regular maintenance) had scores averaging above 4 that systems management information financial the area has contributed to the quality local government finance report Karanganyar. Based on the frequency distribution that all the indicators of utilization sytem regional financial management of information had an average score above 4. This means that the use of the management information system of regional keuangan has a role in improving the quality of local government financial statements because karangayar district through the management information system of regional keuangan financial statements are produced more quickly intervening, precisely, and accurately so that the financial statements produced can be resolved in a timely manner.

Statistical analysis results model big bang local government readiness acceleration strategy against accrual based accounting system affects quality of local government finance report Karanganyar (X4).

Big bang model analysis accelerated readiness strategy against local government accrual based accounting system in

Karanganyar with partial least square, do two things, first, outer assess measurement models or models is an assessment of the reliability and validity of the study variables. There are several criteria for assessing the outer models: the convergent validity and discriminate validity. Second, assess the inner structural models or models, testing inner structural models or models made to look at the relationship between constructs, the significant value and r-square of the research models. This study examined the effect of human resource competencies, the government accounting standards application 2010, utilization of information systems local government finance and accounting system implementation accrual based on the quality of local government finance report Karanganyar. Overall the full information models of factors that affect the quality of the local government finance report Karanganyar in accordance with the calculated partial least square. Research model big bang strategy accelerated readiness local government against financial accounting system based accrual in Karanganyar this shows that the utilization of information system of financial management has a positive influence and significant indirectly to the quality of local government finance report Karanganyar through the implementation of the internal control system government. This means that the utilization of regional financial management information system in the preparation of the local government finance report Karanganyar supported by the internal control of the government. The strength or weakness of government internal control system owned may affect the quality of local government finance report is generated. Results of this study support expressed by Yosefrinaldi (2008) concluded that the use of information technology and

significant positive effect on the quality of local government finance report. Internal control systems is one of the benchmarks that must be in boost local government in the preparation of financial statements. Because the internal control system is capable of forming the organizational structure, methods and coordinated measures to safeguard the wealth of the organization, check the accuracy and reliability of accounting data, the drive efficiency and compliance with government policy. This is in line with the objectives of internal control systems items, namely, providing reliable data, the increase of operational efficiency, encourage the implementation of existing policies, protect corporate property, check the accuracy and reliability of accounting of data improve business efficiency, encourage compliance with policies that have been outlined, and improve the quality of financial reporting.

Implementation of regional financial accounting system based accrual (Y1)

Distribution of respondents on variables regional financial accounting system implementation based accrual yang an intermediate variables in this study are presented in Table 8. Overall indicators of variables regional financial accounting system implementation based accrual showed that internal controls are applied Karanganyar district government has implemented well visible from the average value score is above 4. But there are values of respondents in grades 3 below shows that the adoption of the financial accounting system based regional accrual masih requires serious attention because the adoption of financial accounting system based regional accrual is a very important factor in improving quality of the local government finance report.

Table 5. Frequency Distribution Finance SKPD perception of business in Karanganyar District Government Implementation Regional Financial Accounting System Based Accrual

Indicator	Unit	Score					Total	Mean Score
		1	2	3	4	5		
Integrity	People	-	-	1	40	39	80	4,48
Data	Percent	-	-	1,25	50	48,75	100	
Procedures	People	-	-	2		42	80	4,5
The accuracy	Persen	-	-	2	36	42	80	4,5

Indicator	Unit	Score					Total	Mean Score
		1	2	3	4	5		
Posting the data	People	-	-	2,5	45	52,5	100	
Procedure authorization	Persen	-	1	3	43	33	80	4,35
storage of data	People	-	1,25	3,75	53,75	41,25	100	
Data source	Persen	-	-	-	38	42	80	4,53
Devison Responsible	People	-	-	-	47,5	52,5	100	
	Persen	-	-	4	29	47	80	4,54
	People	-	-	5	36,25	58,75	100	
Average	Persen	-	0,25	2,5	46,5	50,75	100	4,4

Table 5 frequency distribution perception of financial management at the local government unit Karanganyar district government on adoption of variable-based regional financial accounting system acrual 2016.

Quality of Local Government Finance Report (Y2)

Quality of local government finance report consists of five indicators namely local government financial statements are

presented in a reliable, relevant, understandable, comparable and in accordance with the guidelines for the preparation of local government finance report the data in Table 6 shows that the quality of the local government finance report has been prepared in accordance guidelines for the preparation local government financial statements are seen with a score of respondents are in the average score above 4.

Table 6 Local Government Financial Statements quality SKPD Local Government Karanganyar

Indicators	Unit	Score					Total	Mean Score	Indicators
		1	2	3	4	5			
Relevant	Orang	-	-	-	-	31	49	4,61	
	Persen	-	-	-	38,75	48,75	100		
Reliable Can be trusted	Orang	-	-	-	36	42	80	4,5	
	Persen	-	-	-	38,75	61,25	100		
can Compared	Orang	-	-	-	2,5	52,5	8	4,5	
	Persen	-	-	-	44	33	100		
Standards Compliance	Orang	-	-	-	44	36	80	4,45	
	Persen	-	-	-	55	45	100		
Can be trusted	Orang	-	-	-	38	42	80	4,53	
	Persen	-	-	-	47,5	52,5	100		
Average	Persen	-	0	0,5	47	52,5	100	4,52	

In the local government financial statements in karanganyar district government has been guided by the regulations and standards that affect the opinion granting of financial audit institutions. Distribution of respondents about the quality of the local government finance report presented tables.

Using the big bang model is applied to the model of public sector accounting kontigensi then formed a working hypothesis of the findings with contextual variables include: information on public sector accounting: public sector accounting system reform will be greatly influenced by the recruitment of staff, especially the accounting staff as well as the provision of

training regarding the accrual accounting system, and the recruitment of staff will be the factors that influence the basic attitude of the staff in readiness to accept change and undertake further development of the accrual accounting system. Barriers to implementation: there are some things in perspective can be a bottleneck in penerpaan accrual accounting in government karanganyar district which include a commitment, staff with the necessary qualifications and supporting devices. From the findings and data analysis can be concluded that there are several factors that are instrumental in the successful implementation of accrual accounting in government areas karanganyar which include: commitment factors affecting successful implementation is still a lack of commitment from the employer that needs to be done the trick and their own initiative in seeking information about accrual accounting. As well as the lack of support

provided such as training, technical assistance and transfer knowlegde of independent parties understand accrual accounting system. The quality of personnel required is still a lack of human resources that understand accrual accounting system, this is more due to the frequent occurrence of turnover (rolling) employees primarily for accounting staff in each local government unit. Lack of support tools supporting devices such as systems and procedures and accounting policies that have been based accounting refers to the financial statement presentation akrualas government. The report consists of the central government financial statements, financial statements of ministries/agencies and local government financial statements whose components include the balance sheet, budget realization statement, cash flow statement, and notes to financial statements 2015 opinion to the local government Karanganyar is unqualified 2016.

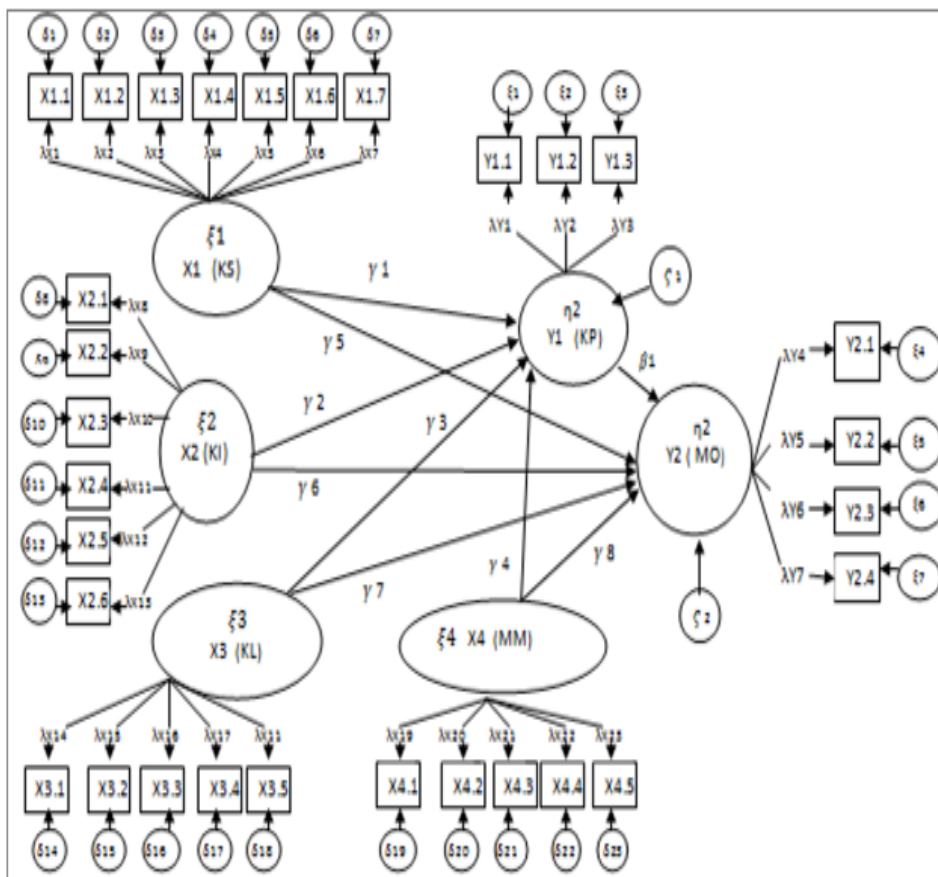


Fig.1. Model big bang local government readiness acceleration strategy against accrual based accounting system affects quality of local government finance report Karanganyar.

IV. CONCLUSION

Results from the study showed the following: the district government Karangayar yet to set a plan/strategy for the implementation of accrual-based government accounting standards formally; regulation on the accounting policies, the local government accounting system and the standard chart of accounts is less clear and has not aligned; placement human resources manager of finance, assets, and information technology which is not according to the field; training/socialization of the human resources related to the implementation of accrual-based government accounting standards inadequate; the application system used Karangayar district government has not, as required; and control over the application system still wrong indicator of the quality of financial accountability views of the external auditor's opinion, the supreme audit agency, on the government's financial statement presentation. The report consists of the central government financial statements, financial statements of ministries/agencies and local government financial statements whose components include the balance sheet, budget realization statement, cash flow statement, and notes to financial statements 2015 opinion cpc to the local government Karanganyar is unqualified 2016.

REFERENCES

- Adhikari, P and Mellamvik, F, 2011. *The Rise and Fall of Nepalese Central Government*. Journal of Accounting in Emerging Economies vol 112: 123-143.
- Anwar, S.,2007. *Budgeting and Budgetary Institutions, Public Sector Governance and Accountability* . Washington: World Bank.
- Athukorala, L. 2003. *Accrual Budgeting and ccounting in Government and its Relevance for Development member Countries*. Manila: Asian Development Bank.
- Barton, D. 2004. *How to Profit from Defence: A Study in The Misaplication of Business Accounting to the Public Sector in Australia* . Financial Accountability and Management. 10: 281-304.
- Beechy, T.H.2007. *Does Accrual Accounting Enhance Accountability, The Inovation Journal The Public Sector Inovation Journal Volume 12, 1:1-18*.
- Blondal, J. 2003. *Accrual Accounting and Budgeting: Key Issues and Recent Developments*. OECD Journal on Budgeting,3 : 43-131.
- Bovaird,T.Loffer,E.2003. *Public Management and Governance*. New York: Routledge.
- Buhr, N. 2010. *From Cash to Accrual and Domestic to International Government Accounting Standard Setting in Last 30 Years. Sixth Accounting History International Conference, Welington. 19 Agustus*.
- Carlin, M. T. 2005. *Debating the Impact of Accrual Accounting and Reporting in the Public Sector*. Financial Accountability and Management, 3: 309-336.
- Carlin, M. T. 2005. *Debating the Impact of Accrual Accounting and Reporting in the Public Sector*. Financial Accountability and Management, 3: 309-336.
- Chenhall, R.H. 2004. *The Role of Cognitive and Affective Conflict in Early Implementation of Activity Based Cost Management*. Behavioral Research in Accounting, Vol. 16.
- Christensen, T et al.2007. *Organization Theory and The Public Sector, Instrument, culture and Myth*. New York: Routledge.
- Connolly, C. Hyndman, N. 2010. *Accrual Accounting in public sector : a road not always taken*. Institute of Public Administration. IPA. Rome, 28-30 November.
- Ellwood, S. Newberry, S. 2006. *Public Sector accrual Accounting Institutionalizing Neo-Liberals Principles*. Accounting, Auditing,

- Accountability Journal vol 20, 4: 549-573.
- M Treasury. 2005. Delivery the Benefit of Accrual Accounting for Whole Public Sector. London. HM Treasury.
- Hood, C. 1991. A Public Management for All Season. Royal Institute Public administration Journal Volume 69, 1: 1-19.
- Hughes, O. 2003. Public Management and Administration an Introduction (3 diction). New York: Palgrave Macmillan.
- Fatimah. 2013. Effect of Training, Management Support and Clarity of Purpose t Peak Regional Finance Information System Effectiveness.
- Fishbein, Martin and Ajzen Icek. 1975. Belief, Attitude, Intention and Behavior. An Introduction to Theory and Research. Addison-Wesley Publishing Company Inc.
- Ghozali, I. 2006. Applications Multivariate Analysis SPSS program, the Agency Publisher University Diponegoro, Semarang.
- Hair, J.R, R.E Anderson. R.L. Tarham, W.C. Beack. 1998. Multivariate Data Analysis, Fifth Edition, Prentice Hall International Inc.
- Nurlaela, and Rahmawati. 2010. Influence of Organizational Behavioral Factors to Regional Financial Accounting System Uses in Subosukawonosraten. SNA XIII, Purwokerto.
- Nurlaela, Solichul. Fajar, 2016, *Effect Of Training, Clarity Purpose, Tops Support To Use Local Government Financial Accounting System In District Karanganyar Central Java Indonesia*, International Conference on Economics and Social Sciences (ICISS) held in Amsterdam, Netherlands on 30 April 2016. The Institute of Research Engineers and Scientists, Paper ID: IRES-ICISS AMSTRDAM-30046-02
- Republic of Indonesia, Law of the Republic of Indonesia, No. 33 of 2004 on Financial Balance between the Central Government and Local Government.
- Ministry of Interior of the Republic of Indonesia. , The Indonesian Government Regulation, No. 56 Year 2008 concerning Regional Financial Information System. Ministry of Justice and Human Rights of the Republic of Indonesia.
- Siti Nurlaela, Rahmawati, 2010, *Factors To Use Behavior organization Regional Financial Accounting System in Subosukowonosraten*, International Seminar Globalization Social Cost and Benefits For The Thrd World, UNS, 377-387. ISBN 979-498-530-9.
- Syafrudin, M. 2005. *Effects of Innovation Factors in Relation Moderation Partisipation Budgets, Decentralized Structure and Performance Management, Organizational Studies in Local Government*, Journal of Accounting and Public Sector Finance, Volume 06. No. 02. August.
- Supartini. 2000. Impact of Power on the Use of Regional Financial Information System Against Behavior. Accounting Studies, August 2009, Vol. 1 No. 2 ISSN: 1979- 4886.

VOCATIONAL VILLAGE INITIATIVES FOR COMMUNITY SKILL DEVELOPMENT BASED ON LOCAL RESOURCES IN AEC

¹Suhendar, ²Siswo Wardoyo, ³Syadeli Hanafi

^{1,2,3} Universitas Sultan Ageng Tirtayasa
suhendar@untirta.ac.id; siswo@untirta.ac.id; syadeli@untirta.ac.id

ABSTRACT

The village is a source of real economy and the livelihood of most of the population of Indonesia. Strategic value for village progress are both from the ideological, political, economic, and defense and security. The village is a manifestation of the importance of rural development, and many villages have not optimized the potential for sustainable used. Therefore, the University of Sultan Ageng Tirtayasa (UNTIRTA) obliged to assist in accelerating the development program with a touch of science and technology superior. Contribution UNTIRTA expected to encourage initiative, movement, and the participation of rural communities to the development potential and assets to the common welfare as well as to strengthen the community as the subject of development in Banten. The problem faced by the majority of villages in the province of Banten include lack of jobs, do not have expertise in the field of technology in addition to farming and herding, the access road which is taken into the village is not feasible, and the high level of poverty in the village with the residents, still rundown, including public health problems and malnutrition. On the other hand, the villages are located in industrial areas, coastal and Banten island has abundant natural resources began to food, agricultural products, inland fisheries, marine fisheries, including waste or effluent from industrial processes around. Potential natural potential has not been fully optimized to provide added value and improving the welfare of local villagers. This is compounded by the lack of skills and competencies mastered the technology, especially by the community of productive age.

Keywords: vocational village, community skill, community development, local resources, AEC

I. INTRODUCTION

The ASEAN Economic Community (AEC) blueprint calls for equitable economic development and enhanced competitiveness, dynamism, and resilience of ASEAN small and medium-sized enterprises (SMEs) by "facilitating their access to information, markets, human resource development and skills, finance as well as technology. ASEAN has focuses indirectly on the informal economy through its support to micro, small and medium-sized enterprises (MSMEs), including enterprises in rural and agriculture-based communities. The recent global financial and economic crisis has demonstrated the futility of continued dependence on foreign aid for financing economic growth. The African Development Bank, ably supported by other International Financial Institutions is solicited in muting an African institutions dedicated to improving domestic resource mobilization in SSA. The expected improved resources from these efforts will help imbue SSA countries

with freedom and policy space to take charge of developing, crafting, implementing and managing policies that will impact positively on their efforts to recover quickly from the negative effects of the global financial and economic crisis and ensure sustained economic growth, development and transformation.

Most of the workers involved in intra-ASEAN labor migration are low-skilled and working in agriculture and fishing, domestic work, food processing, manufacturing and construction. An estimated 87 per cent of migrants in ASEAN countries were low-skilled in 2007 and up to a third employed in the informal sector and hence, not fully protected by labor laws. Migration contributes to economic growth and poverty reduction in both counties of origin (primarily through remittance flows) and destination (through private sector economic growth).

There are conditions will be minimized slowly through the application of science and

technology for Rural Partners. Empowering Partners and Agencies/Department of Local Government, has general program offered expected to handle the problem: (1) Low mental attitude and awareness to establish themselves and their environment; (2) Low community life skills that ensure and

develop welfare based on the existing natural resources; (3) The geographical situation of unprocessed and well run; (4) The planning, implementation and evaluation of development in the area has not been systemically integrated, empowering and sustainable.

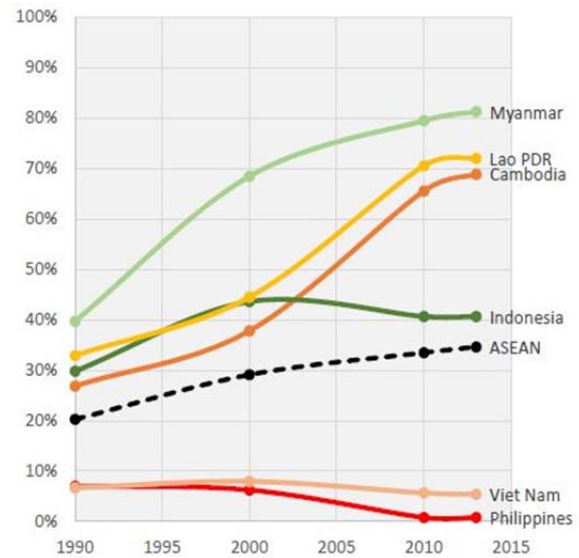
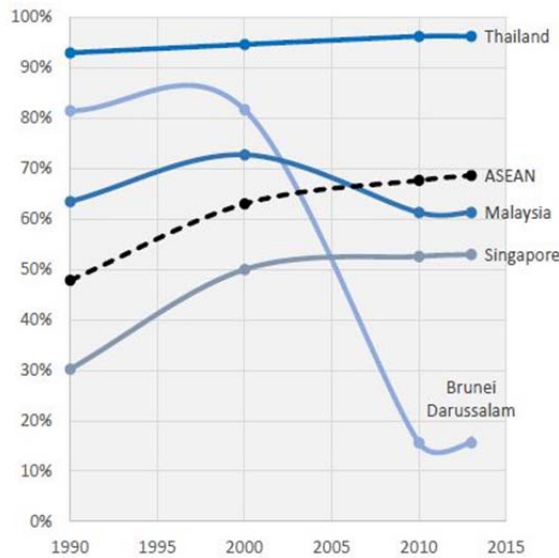


Fig 1. Estimated intra-ASEAN shares of migration in ASEAN Member States, 1990-2013 (%)
Source: UNDESA

The purpose is to develop the application of Rural Vocational Education (RVE) as Technopreneur Community Empowerment Center in the Industrial Area, Coasts, and Islands (IPP) Banten. Establishment of Rural Vocational targeted to contribute in empowering communities through the application of technology for the utilization of local potential, economic empowerment, especially domestic industry, fishing groups, cooperatives, and agricultural development that includes the participation of indigenous villages. RVE offered functions as an initiator, motivator, facilitator, innovator and communicator in the development of community competence.

II. VOCATIONAL VILLAGE INITIATIVES

Non-formal education program based on the priority of the plan located in 2010-2014 include improving implementation of the program of courses in rural oriented grade life skills and relevant through Village program Vocational. The purpose of the Rural Vocational Education Program is to

reduce the unemployment rate and the level of urbanization by providing skills in a rural community in comparative advantage and competitive advantage of the resources and the potential of a country based on local wisdom. There is some rationale behind the importance of an initiative to improve the skills of the population (village) local, through the establishment of vocational villages:

- 1) The dropout rate (drop out) SMK/SMU/MA plus junior high school graduates, high school do not continue to higher education of 1.6 million children/year
- 2) The poverty rate in Indonesia amounted to 28.55 million or 11.47% of the total population of Indonesia
- 3) Unemployment Figures Open in Indonesia of 7.4 million or 6.25% of the total labor force of 118.2 million people (source: BPS Sakernas month August, 2013)
- 4) The potential of natural resources in the village are not processed by young workers are productive so neglected and

village development stagnated, resulting high youth movement of workers in the countryside seeking employment in the cities (urbanization increases).

Indonesia has about 78.609 villages, consisting of 70.390 administrative villages and 8.083 urban village administration scattered throughout the archipelago with diversity wealth of natural resources are abundant both in the sector mining, tourism, agriculture, forestry, plantation and others.

Vocational Village program is intended to develop human resources in rural spectrum with a regional approach, namely, the rural areas which is based on cultural values with harness local potential. Village vocational program highly relevant to the needs rural communities and easily implemented on because the following reasons:

1) The kind of skills that were held in accordance the potential of the local area;

- 2) enthusiastic community because during this extremely rare No course or training skills in village based on the needs of rural communities.
- 3) many agencies, organizations, businesses, offices agencies, and local governments provide support.
- 4) The results can be used as livelihood skills The main or side for the community

Objective of the Rural Vocational Education Program is provide support for a variety of skills production/services for residents in rural communities in order able to empower the rural productive potential as a source of revenue to improve quality life and rural development. The village held a Vocation means building a village independently for 29.89 million poor people around 63 900 villages in Indonesia each year need provision of skills.

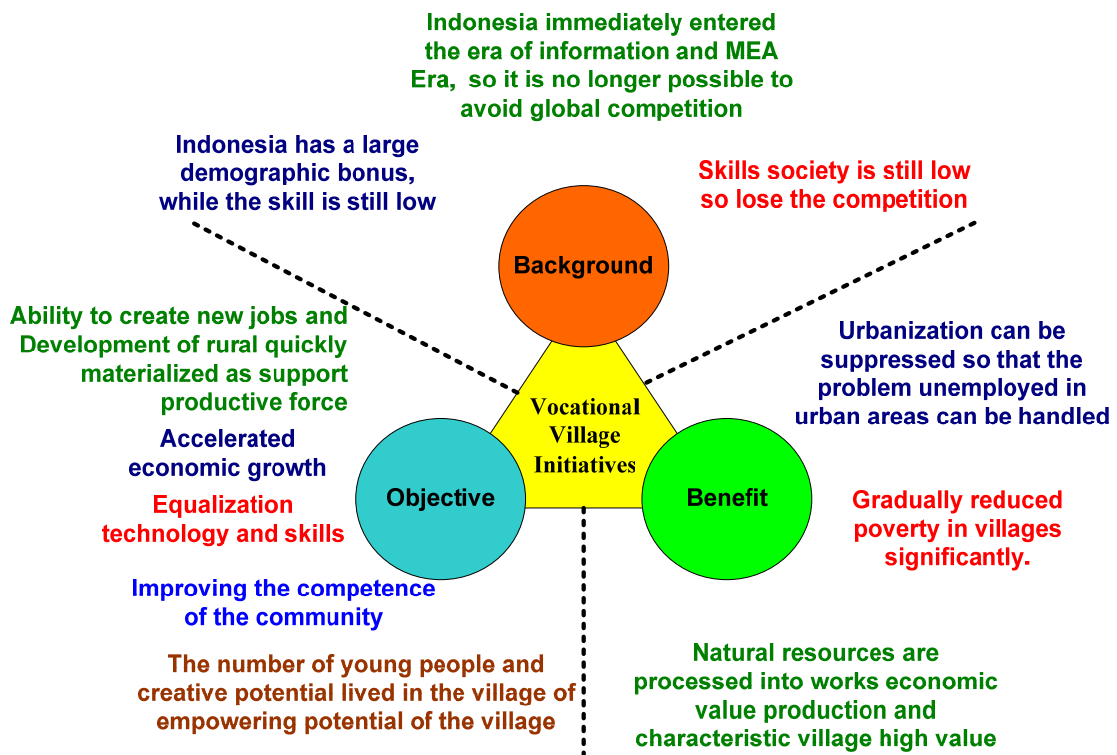


Figure 2. Importance of Vocational Village Initiatives

Even though many programs are available for the rural poor, more measures need to be adopted to help the poorest of the poor - persons with disabilities living in rural areas. Many rural persons with disabilities

are forced to go to the city for rehabilitation or livelihood training. Poor farmers with disabilities need to generate income or supplementary income to become active participants in their families and

communities, thus reducing the burden of their disability on both family and society. This guide is designed for governments and NGOs working towards the social integration, rehabilitation, training and empowerment of persons with disabilities in rural areas. Its main objective is to give direction on how to prepare persons with disabilities to generate income through micro-enterprise development. Training rural persons with disabilities in their own communities has the advantage of letting the trainees remain with their families and learn a trade that is accepted by the community.

- 1) Observations about special qualities of trainers for persons with disabilities
- 2) Development of four main learning steps:
 - a) To improve daily living skills
 - b) To impart technical capabilities and capacities
 - c) To develop entrepreneurial skills
 - d) To establish a network and strategic partnerships
- 3) Development of criteria for the selection of trainees
- 4) Gender issues

- 5) Issues and considerations to be addressed prior to training

III. COMMUNITY SKILL DEVELOPMENT BASED ON LOCAL RESOURCES

Building up the capacity of persons with disabilities to become micro-entrepreneurs improves their livelihoods and has beneficial effects on the quality of their lives and health. It helps to reduce rural poverty and food insecurity.

Nevertheless, it is not simply a matter of supply and demand. It is the task of the state to create appropriate framework conditions and incentive systems, and in this way to ensure the integration of TVET into the entire educational system. Another aspect that should not be forgotten is the fulfillment of the fundamental human right to education. This is important as education not only contributes to overcoming poverty and developing an individual's personality, but also constitutes a fundamental pillar for promoting an independent and participation-oriented society. In TVET, these aspects are integrated into the qualifications for the working environment.

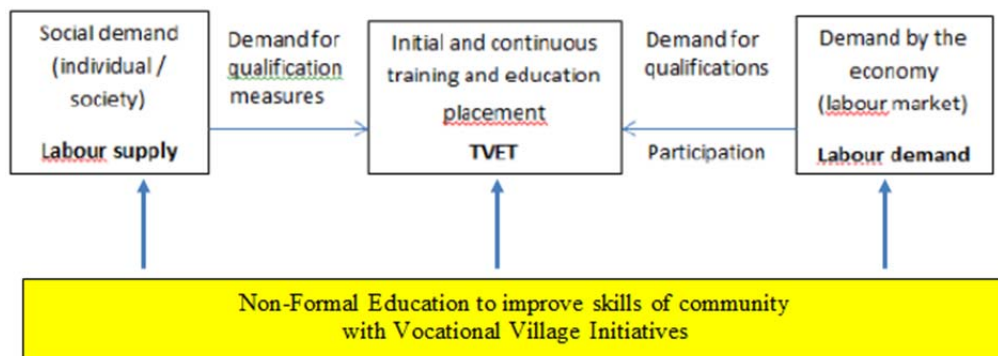


Figure 3. Graphic illustrates the specific situation of TVET and Vocational Village Initiatives

For example, the low level of public education and the high school dropout rate in the district of Lebak demanding University of Sultan Ageng Tirtayasa (UNTIRTA) as much as possible should be able to work together in completing the accelerated development bravely into job creators or create business opportunities with all a better understanding of the technology and scientific thinking of various disciplines. Dare to be job creators and must have thought to improve the communities in

charge of development real. Through KKN PPM program can be formulated a program proposal that could overcome problems in order to provide training and empowerment of communities, including:

- 1) Increase the ability of students in the application of science and technology in accordance with the fields of science and their respective expertise
- 2) Provide knowledge of appropriate technology, training, and applying it

through the Socio-Technopreneur pattern to the community

- 3) skills training activities (life skills) for small industry craftsmen in the field of production engineering and business management, practical skills include the selection of raw materials-the production process and the quality test
- 4) Provide entrepreneurial training and appropriate technology in the field of Industrial Engineering and Electrical Engineering for have no works and dropouts to development of quality of life. These practical skills include self-employment and debriefing and a high work ethic to make ends meet
- 5) Empower the potential environmental, management of household waste that is organic and non-organic integrated manner in order to create domestic product, home industry thereby building sustainable independent entrepreneurs
- 6) Provide training and the installation of energy-saving lighting technology
- 7) Establish a non-business field, PKBM integrated and sustainable built village

Those some examples of community empowerment training activities in one of the villages in the province of Banten, are handicraft training (Fig. 4), cultivation catfish above swimming sheeting (Fig. 5) and training installation energy saving light bulb (Fig. 6).



Figure 4. Handicraft Training



Figure 5. Cultivation Catfish above Swimming Sheeting



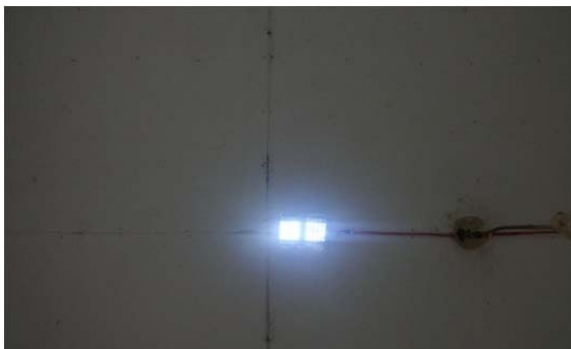


Figure 5. Training Installation Energy Saving Light Bulb

IV. CONCLUSION

Vocational village initiatives for community skill development based on local resources in the AEC, will be given expected results:

- 1) The number of young people and creative potential lived in the village of empowering potential of the village
- 2) Natural resources are processed into works economic value production and characteristic village high value
- 3) Urbanization can be suppressed so that the problem unemployed in urban areas can be handled
- 4) Ability to create new jobs
- 5) Development of rural quickly materialized as support productive force
- 6) Gradually reduced poverty in villages significantly.

REFERENCES

- Abetti, P.A. (1992). *Planning and Building the Infrastructure for Technological Entrepreneurship*. International Journal of Technology Management, 7 (1-3), 129-139
- Adam Szirmai & A. Serwanga (2010), *The Interplay of Human and Social Capital in Entrepreneurship in Developing Countries*. Journal of Development Studies, 39, (2), pp. 155-177
- ADB (2009): *Good Practice in Technical and Vocational Education and Training*. Asian
- ADB (2010): *Strengthening Inclusive Education*. Asian Development Bank. Mandaluyong City,
- Philippines, URL: <http://www.adb.org/publications/strengthening-inclusive-education>, [24.06.2015].
- ASEAN (2011), *Bali Declaration on the enhancement of the role and participation of the persons with disabilities in ASEAN Community*, URL: <http://www.asean.org/resources/item/bali-declaration-on-the-enhancement-of-the-role-and-participation-of-the-persons-with-disabilities-in-asean-community>, [17.06.2015].
- BMZ (2012b), *Vocational education and training in German development policy*, Bonn, URL: http://www.bmz.de/en/publications/type_of_publication/strategies/Strategiepapier326_08_2012.pdf, [26.09.2015]
- Adam, S. (2010), *Intellectual Property Rights, Innovation and Economic Growth in Sub-Saharan Africa*. Third Biennial Conference of the European Consortium on Political Research Standing Group on Regulatory Governance on 'Regulation in an Age of Crisis'. Dublin: ECPR.
- Ando, M. and F. Kimura (2013), 'What Are the Opportunities and Challenges for ASEAN?', ERIA Discussion Paper 2013 no.31. Jakarta: ERIA.
- ASEAN Secretariat (2008), *ASEAN Economic Community Blueprint*. Jakarta: ASEAN Secretariat. Available at: <http://www.asean.org/archive/5187-10.pdf>
- ASEAN Secretariat (2013b). *ASEAN Community in Figures 2012*. Jakarta: ASEAN Secretariat. Available at: [http://www.asean.org/images/2013/resources/statistics/web ACIF2012_e-publish.pdf](http://www.asean.org/images/2013/resources/statistics/web_ACIF2012_e-publish.pdf)
- Chia, Y. (2011), 'Free Flow of Skilled Labor in the ASEAN Economic Community', in Urata, S. and M. Okabe (eds.), *Toward a Competitive ASEAN Single Market: Sectoral Analysis*.
- Tambunan, T. (2006), *Development of Small and Medium Scale Industry Cluster in*

- Indonesia. Jakarta: Kadin Indonesia-JETRO.
- Tay, S. (2013), *Growing an ASEAN Voice? : A Common Platform in Global and Regional Governance*. ERIA Discussion Paper 2013-19. Jakarta: ERIA.
- Anh, B.M. (2011). *Lessons and Challenges of Development Strategies in Asia: Korea, Indonesian and ASEAN Experience*. Conference report. Jakarta: CSIS & Korean Association for Public Administration, Korean Culture and Information Service.
- Bappeda Kab Lebak. (2012). *Lebak Dalam Angka*. Pemerintahan Kabupaten Lebak, Lebak Banten François Thérin (2011). *International Journal of Technoentrepreneurship*, Call for papers, ISSN online: 1746-5389, ISSN print: 1746-5370
- Humbert, Anne Laure. (2012). *Women as social entrepreneurs*. Third Sector Research Centre, Working Paper 72.
- www8.georgetown.edu/Social_Entrepreneur
- Lalkaka, R., (2002). *Technology Business Incubators to Help Build an Innovation-Based Economy*. *Journal of Change Management*, 3 (2), 167 – 176.
- Miller, D. & Garnsey, E., (2000). *Entrepreneurs and Technology Diffusion: How Diffusion Research Can Benefit from a Greater Understanding of Entrepreneurship*. *Technovation*, 22, 445 – 465.
- Roger L. Martin & Sally Osberg. (2007). *Social Entrepreneurship: The Case for Definition*. Graduate School of Business, Stanford England
- Tim Bina Karya Guru (2010). *Kerajinan Tangan dan Kesenian*, Jilid 6, Penerbit Erlangga, Jakarta
- Tim Penulis (2011). *Intensive Student Technopreneurship Program 2011, Recognition and Mentoring Program*, Institut Pertanian Bogor (RAM-IPB)

STRUGGLING CREATIVE HOME INDUSTRY ON IMPLEMENTATION OF MODIFIED BEAN BREAKER TOOLS-MULTICULTURAL CHARACTER BUILDING BASES OF MERAPI VOLCANIC DISASTER

¹Zainur Rofiq, ²RA. Rahmi Dipayanti Andayani, ³Das Salirawati

Yogyakarta State University
zainur_rofiq@yahoo.com

ABSTRACT

The basic reason of conducting this research is to manage the victims in order to have new job after the volcano disaster. The victims of the disaster cannot depend on the help of the government, such as money or material funds. This researchers was implemented the training to the victims to have some skills in struggling creative home industry with the bean breaker tools and their modifications. The theories of creative home industry based on multicultural character building, and the bean breaker tools and their modifications were use as the basic theories to conduct this research. The location of the research was in the volcano area in Merapi Special Region of Yogyakarta. Descriptive qualitative and quantitative methods were use in this research. The multicultural character building analyses data model were implemented. The data collecting techniques were: a) observation, b) interview, and c) questionnaire. The validites were 1) Triangulation to the experts of creative home industry, 2) checking multicultural character building to the experts, 3) consulting basic theory to the experts, 3) implementing the training in using bean breaker tools and their modifications, and 4) verification to the previous results. The research subject to the implementing bean breaker tool and their modifications were trained to the victims of the volcano disaster in Merapi Special Region of Yogyakarta. The results of research show that the bean breaker tools and their modifications was created, and the victims are able to implement those tools effectively. The last result shows that the victims can increase their profits and productions. Those tools are called Bean Multifunctional Machines

Keywords: creative home industry, multicultural character building, bean multifunctional machines

I. INTRODUCTION

It is not a secret that people, in disaster areas volcano, has been reliant on government' aid to support the survival of their economy. This is prove by the fact that they did not try hard or try to live independently from their work. As an example, many families of volcano disaster stayed at the shelter, which is already provided by the government. In the morning, the husbands of volcano victims only work as a motorcycle taxi, for travelers who visit the area and in the evening, they return to the shelter (the result of direct observation of researchers on the spot). The volcano victims only use the facilities provided by the government that only meet daily needs, such as bathing, the need to cook like the drains, and clothing needs which obtained from government contributions. This situation gave a signal to us that these people have not been trying to empower and civilizing

themselves to meet the needs of their economy and develop economic empowerment to earn a decent living and independent.

Self-empowerment and self-empowering culture is to achieve the economic prosperity. Volcano disaster victims need to be assisted in defining the livelihoods with a wise attitude and increasing their economic prosperity. They also need to develop the implementation of mechanical tools, which can be used as a source of income to improve the economy by training, how to empower the economy through the training of implementing the mechanical devices of food processing. That is the soy bean tool breaker machines. It is intended that the victims of the volcano disaster are capable of absorbing the knowledge of how to empower this tool to change their life to be individuals with a creative spirit of home industry. Thus, the

implementation of mechanical devices are expected to give the aspirations of the people to boost their economy through the cultural of producing the food to become industrial centers that can be marketed not only in the volcano area but also in other areas both nationally and internationally.

It is easily to get the soybean raw material in rural areas. However, the soybean processing is still very traditional and less hygienic. As example, the way to separate soybean husk is by trampling it, which take a very long time.

II. METHOD

The method used in this research is descriptive qualitative and quantitative. The data are in the form of oral speech and written language, while the source of data is the entire volcano disaster victims. Data collection techniques will be conducted by (a) observation, (b) interviews, and (c) questionnaires. This study obtained the data by using participant observation. Data analysis performed with the descriptive qualitative and quantitative approaches. Data collection techniques are using purposive sampling. Object of this study is the victims of Mount Merapi volcano in Special Region of Yogyakarta.

III. RESULTS AND DISCUSSION

3.1. Need Analysis Description

This research was also conducted interviews with people in disaster-prone areas of Mount Merapi. In this case, the research is focused on members of the targeted community who have a business industry of making *tempe* (Fermented soybean). Based on interviews with one of them, the researchers obtained a variety of important information that can be the part of the discussion of this study.

After the catastrophic eruption of Mount Merapi in 2011, most people in Cangkringan (targeted research) have misgivings and feelings of worry over the possibility of a similar disaster, especially for Mrs. Suhardi whose one of her sons get deformed feet because of the disaster. Whenever there is little land' movement or rumble, the memory in 2011 crossed her mind.

Nevertheless, Mrs. Suhardi realized that life must go on and live must be life. Therefore, she rose again to start a business of making *tempe* which is her livelihood during this time. She is one of the largest *tempe* makers in Cangkringan village. Before the disaster, she already had regular customers as a distributor in marketing the *tempe*. Then, after the disaster, some customers had migrated to the other makers of *tempe* outside the disaster area, except her loyal customers. This may be because the recovery from the catastrophic eruption of the volcano requires a relatively long time such as physical recovery like the destroyed house, family members as victims, as well as in the form of healing traumatic psychological recovery and return their confidence to stand up and be independent. Likewise, the people who have business of home industry were raised and motivated to start the business again in order to meet their needs. The length of recovery causes the customers run to another makers. While the people of the home industry in disaster area began to rise, they also have to start from the bottom and find new customers.

Understandably, getting back to make *tempe* is not easy for them, especially with a lot of business equipments damaged when a disaster occurs. Besides, making *tempe* traditionally also makes it difficult to produce large amounts in a short time. However, traditional *tempe* made by Mrs. Suhardi and Mrs. Hadiwiyono has advantages compared the *tempe* from other home industry which can stand up to four days, while the other *tempe* only lasted to two days.

Without any help from the government, the families are warmly welcome when the research team offers innovative soybean breaker machine. Feeling cared, they are also grateful that they are helped to ease the primary work of making *tempe* which is break the soybean as the raw material of making *tempe*. Formerly, the process of breaking soybeans is traditional done by trampling on it while washed. It took a relatively long time and a big effort. Unfortunately, the result is not perfect. It means there are soybeans that have not been broken and some crushed. Differently done

with a soybean crusher tool, the results are relatively similar and perfect; soybeans all crush into two and no soy are broken. Before, they have purchased the soybean crusher for Rp 900,000,- but a lot of soybeans are broken (crumble).

Based on questions about whether they are willing to follow the training program, they answered firmly that they are very willing to follow the program. This is because both before and after the disaster they have never received training from any party, either training for making *tempe*, knowing diversity of products from soybeans, moreover, training for making soybean breaker tool. Their ability to make *tempe* is not based on training, but only passed down from their parents; Previously, they became the staff in *tempe* factory, after that they can make *tempe* independently.

Therefore, if it will really be held the training on the manufacture of making soybeans breaker machine and how to take care (maintenance), they are very enthusiastic welcome it. Especially for people who already felt old, their training is seen as the regeneration of his descendants to carry on the business of making *tempe*. The soybean breaker machines regarded as innovation for them, because, from the beginning until now, the job of breaking soybeans only done traditionally without any kind of assistance, except their feet. Besides, it is less hygienic because it can't be guaranteed that their feet are clean from dirt and germs/bacteria. Moreover, using feet in the food processing is consider as less ethical; refer to its lowest position from human body. The word 'trampled' has a less value of sense that unacceptable to us, especially in this case, the thing to be trampled was food for human.

The presence of soybean breaker machine is not only to speed up their work in making *tempe* but also to give meaning which based on multi-cultural of character building. It is caused by the culture built in the manufacture of *tempe* just a tradition of hereditary by the local community and have never been associated with the culture of increasing the value of *tempe* as one of the Indonesian products. Therefore, we have ever heard that the neighbors tried to claim

tempe as their typical food, but in real and clear, *tempe* is originally our nation's food. Products of our nation's culture need to be improved, in terms of forms, processing methods, and how to market. Thus, although *tempe* is a "traditional food", it will not be displaced by the new types of food which usually have more values in terms of form and appearance, taste and way of packaging and marketing.

In the presence of soybeans breaker tool, it is totality capable of supporting the character of independence and entrepreneurship. While keeping traditional typical foods of our nation, these machines help to speed up the work and maintain the hygiene of the manufacture of *tempeh*, which is soybean. If a culture of entrepreneurship in making *tempe* already packed in modern marketing, it will definitely bring more customers as well as expand the marketing network, increase the number of products that can be easily fulfilled through the assistance of soybean breaker tool owned. Before the disaster happened, *tempe* products which belong to people in disaster areas volcano have been able to be expanded the marketing to Jakarta, Lampung and Surabaya. However, it was done by people who accidentally wanted to heading into the city, it not purposely spending for sale.

3.2. Soybean Breaker Machines Description

The mechanism of soybean breaker seeds machine is by use two pieces of roller stones, which placed in a horizontal position. This machine has three parts: the hopper, mill bodies and lid milling machine. On the mill body, the roller stones fitted with each other and connected by using a shaft; one roller connected to the pulley and the other is attached to the body of the mill. There is a hole both in the middle of each stones' surfaces. The diameter of the roller stone that would be use adjusted with the desired capacity. On the body of the mill, there is a threaded shaft that can be rotated to adjust the distance gap between the stone and a knife on the nut splitter, which is used to push in the soybean seeds that fall from the hopper into the crevice between two stones.

Stone which connected to the shaft and associated with the pulley is a rotating stone, While, stone which is associated with a cover stone mill is un-rotating stone. Both roller stone almost have the same thickness, but on the surface of each stone, it made to be rough with different profiles. On the surface of un-rotating stone, it was made holes only a few millimeters deep; not until its translucent,. While, for rotating stone, on the surface, there is a circular groove which circles have larger diameter towards the outside. In addition, its surface is made not flat but in the central section of the rock have a thinner thickness of the edges of the stone. The lid of the mill body was given a hole underneath for discharge as a soybean seed that has been cleaved.

3.3. Machine Performance

On the operation of this machine, the soybeans should be soaked or boiled in water for several hours before inserted into the breaker.

First, the soybean is put into the breaker through the hopper. To push soybean seeds to get into the gap between the two rollers stones, the body crusher was installed with a splitter blade associated / welded nut (screw mixing knife) which can rotate. Because the rotation of the mixing screwing this knife, soybean seeds can get into the gap between two roller stones and can be cleaved. During the breaking process, the water should be added continuously. The additional water was intended that the soybeans can get out from the crack breaker.

If it felt, the result of breaking of soybean seeds are too smooth so that the soybeans are crushed the regulator of screw shaft can be rotated to enlarge the gap between the two stones breaker. Then, after setting the gap of two roller stones is finished, the regulator of screw shaft can be locked using the handle lock, to prevent the setting that has been done would not changed during the subsequent breaking process.

In this research, there have been designed the multifunctional soybean breaking machine components by calculating the dimensions of some components. The main calculations performed on this machine

are the motor power, shaft peeler, belts, pins, and bearings. The motor power from the result of calculation is 0.35 HP at 1.400 rpm rotation, so the selected motor power is 0.5 HP of the standard on the market.

3.4. Machine Trial Testing and Analysis

Procedures of machine trial testing are follows these steps:

- a. The condition of soybean seeds before put into a grinding machine must have been soaked in water for 3-5 hours.
- b. Water soaked did not enter into the breaker.
- c. The engine rotation: 1.400 rpm .
- d. The rotation speed of the electric motor during the process of breaking is measured by using a tachometer.
- e. During the breaking process, the water flowed with a constant water discharge.
- f. To find out the discharge of water used, experiment done by entering in 1500 ml of water (1.5 liters) into a container, which has been given a water tap. Then, the water tap is opened and the length of time needed to spend 1.5 liters of water is 1.58 minutes. The measurement of time use stopwatch.

From the measurements, the obtained water discharge as follows:

$$\begin{aligned} \text{Water discharge} &= \frac{\text{Water volume (lt)}}{\text{Time (minutes)}} \\ &= \frac{1,5 \text{ lt}}{1,58 \text{ minutes}} \\ &= 0,95\text{lt/minutes} \end{aligned}$$

So, the water discharge required in this experiment is 0,95lt/minutes.

Table.2 Experiment of measurement with 5 kind of different weight

Soybeans' Weight (kg)	Times (minutes)	Water Discharge (ltr/minutes)
1	1,52 minutes	0,95
	1,49 minutes	0,95
2	3,15 minutes	0,95
	2,90 minutes	0,95
3	4,46 minutes	0,95
	4,46 minutes	0,95
4	5,98 minutes	0,95
	6,10 minutes	0,95
5	7,60 minutes	0,95
	7,55 minutes	0,95

The experiment used mill diameter of 6" or 152.4 mm. The experiment performed by inserting a continuously soybeans into the machine hopper. Data obtained from these experiments as showed on Table 2.

From the results of experiments on Table .3 can be calculated capacity of the soybean breaker machine as (kg / hour).

Table.3 Machine capacity

Soybean' weight (Kg)	Times (minutes)	Machines Capacity (kg/minutes)
1	1,505	0,664
2	3,025	0,661
3	4,450	0,674
4	6,040	0,662
5	7,575	0,660
Total		3,321

The average engine capacity = $\frac{0,321}{5} = 0,664$ kg/minutes, Engine capacity expected = 40kg/hour. Thus, it explained that the breaker had achieved the expected results. From the discussion above, it showed that:

- a. The results of experimental soybean breaker approached the expected result that is the capacity of 40kg / hour.
- b. The use of soybean breaker machine can shorten the breaking process than breaking it traditionally by trampling on it.
- c. Breaker machine can be operated more optimally if soybeans (this text is not complete based on the original paper).

IV. CONCLUSION

(1) Based on the needs analysis, the volcano victims are very hopeful to be given the soybean breaker machine operation training and its modifications, and also to be given these tools. (2) The results showed that volcano victims' participants were very enthusiastic, active, and asked lot of question about implementing the soybean breaker machines and its modification with the basic of multicultural character building. (3) The Soybean Breaker machines have capacity: 40kg/jam. (4) Soybean crusher that had been made were the multifunction machines which can be used to do another task such as pulverize the peanuts and chili.

REFERENCES

- [1] Andayani, Rahmi D. dkk. 2008. "Implementasi Immersion Program Sebagai Dasar Rancang Bangun Pembelajaran Berbahasa Inggris Di Sekolah Menengah Pertama Bilingual Di Daerah Istimewa Yogyakarta" dalam Penelitian. Yogyakarta: UNY (No. 018/S /P2H /PP/DP2M/III/2008 Tanggal 06 Maret 2008).
- [2] Andayani, Rahmi D. dkk. 2009. "Diglosik Situation dan Fenomena Bahasa Bagi Masyarakat di Kecamatan Gedong Kuning" dalam Penelitian. Yogyakarta: UNY Tanggal Oktober 2009.
- [3] _____. 2011. Peran Masyarakat Kampus dalam Menciptakan Budaya Kampus yang Berkarakter.
- [4] _____. 2012. Percaya Diri, Keingintahuan, dan Berjiwa Wirausaha: Tiga Karakter Penting Bagi Peserta Didik.
- [5] Suparno-Paul. 2012. "Peran Pendidikan dan Penelitian Terhadap Pembangunan Karakter Bangsa" dalam Makalah Seminar Nasional. Yogyakarta: LPPM UNY.
- [6] Sularso,Ir, MSME dan Kiyosaku Suga. (1987). *Dasar Pencerahan dan Pemilihan Elemen Mesin,*
- [7] R.S. Khurmidan, J.K.Gupta,. (1982). *Text Book of Machine Design,*
- [8] Tarwiyah, Kemal. 2001. "Pemecah Kedelai dan Pemisah Kulit Hidrosiklon". Jakarta: Deputi Menristek Bidang Pendayagunaan dan Pemasyarakatan Ilmu Pengetahuan dan Teknologi.
- [9] Zainur Rofiq. (2009). Pemberdayaan Pemuda Putus Sekolah Melalui "Education for Youth Employment Project: Dirjen PLS.
- [10] _____. (2013). Analisis Relevansi Kurikulum D3 Teknik Mesin dengan Tugas Ahli Mayda Desain Rekayasa di Industri Permesinan, Penelitian: Yogyakarta

THE WORKERS COMPETITIVENES OF SMALL BUSINESS ENTERPRISE TO FACE ASEAN ECONOMIC COMUNITY AGREEMENT

Yasrizal

Teuku Umar University, Meulaboh
email: yasrizal@utu.ac.id

ABSTRACT

The competition of labor market in Asean Economic Society will be determined by the labor's productivity. Small businesses of foods and beverages is the highest sub sector which recruit the labor in Aceh. In 2010 there were 929.910 small businesses which were able to recruit 2.152.981 labor or around 31,99%. There are three variables impact the absorbtion of labor, the salary, labor productivity and capital. This research uses multiple regression technique to analyse data. The technique analysis used to find the impact of salary, productivity and capital to the absorbtion of labor in small businesses and enterprises. Based on research finding, the competitive advantage of Indonesian labor is at the sixth rank of ten countries in ASEAN. The research also found that productivity has significant impact to the absorbtion of labor while capital and salary have no significant impact to the absorbtion of labor in Aceh Province.

Keywords: labor competitiveness, productivity, capital, salary and AEC

I. INTRODUCTION

The labor competition is tighter since the ASEAN Economic Community (AEC) was applied. The Countries in the Southeast Asia will establish an integrated area, it would be affect to investment access, distribution of goods and services more easily, that competent labors have a great opportunity to enter another country. The labor are not ready to compete, they will lose in the ASEAN Economic Community competition. This is a new challenge for Indonesian economic development. Labor productivity is the main factor of economic competitiveness, but infrastructure, education quality, investment climate, transportation conditions, logistics, a pro-business banking system and other supporting factors need to be improved to increase the competitiveness of the Indonesian economy in the ASEAN market.

According to Michael Porter, competitiveness in international trade will be achieved through excellence comparative, such as the importance of technological elements and the relationship between governments and the business community should be synergize to improve competitiveness in international trade. The mastery of technology has been proven by

Japanese corporations, they imitated goods which are already invented and made them better and cheaper.

The high unemployment level has been the main problems of economic development and employment in Indonesia. The number of new labors is increasing faster than the employment growth which can be provided annually (Amri Amir, 2004: 2). In 2014, Indonesia has the unemployed 7.56 million persons (BPS, 2015), while in the Aceh Province, there were 216.806 person are unemployed (BPS, 2015).

The process of economic development of a country is often associated with the process of industrialization. The development of industry is the one of the directions for the welfare of the society, namely improving the lives more advanced and qualified (Sukirno, 2005). The industrial sector became the leader of the other sectors to advanced economy system, it's caused by industrial products have a high trading power (Term of Track), more profitable, and is able to create a greater added value compared with products from other sectors. In addition, the industrial have variation production and capable of providing high marginal benefits to consumers (Dumary, 2002).

The Small Business Enterprise (SBE) has an important role in Indonesian economics. SBE is a major player in economic activity in several sectors, as the largest provider of jobs, as an important player in the development of local economic activities and society empowerment, as well as a creator of new markets and a source of innovation. SBE is a labor intensive, which requires labor is more big industries that focused on capital (capital intensive).

Based on data from BPS (2015), the growth of small business enterprises in Indonesia increased by 5.65%, and based on data from BPS Aceh (2015) the number of small business enterprises in Aceh Province are 1,862 units or 2.09% of the total SBE in Indonesia. The food processing industry is as the biggest contributor in employment provider and equalizing the society's income. In 2010, Indonesia has 929 910 units of food processing industry, in every year these industries can provide employment by 2,152,981 people or 31.99% of the total labor SBE in Indonesia (Small and Micro Industries, BPS 2010).

Based on this background, the researcher is interested to analyze the factors affecting that influence recruitment of labors in food and beverages small business enterprises in Aceh Province. The factors become variable in this research are labor salary, labor productivity and capital.

II. METHOD

This research was conducted to analyze labor absorbtion in food and beverages small business enterprises in Aceh Province. The variables will be researched are labor salary, labor productivity and capital.

These research using secondary and primary data. Secondary data obtained by the BPS of Aceh, The Department of Industry, Cooperation Trade and Aceh small businesses and equipped with literal studies. The primary data is the raw data obtained from small business enterprise in Aceh Province, based on a small business enterprise survey in 2014 by the BPS Aceh, specifically in the food and beverage industry (code 10 for food and code 11 for

beverage industries). The number of labor absorptions in food and beverage small business enterprises in Aceh Province, labor salary, capital and labor productivity as the primary data.

The analysis used in this research was multiple linear regressions with a least square method or Ordinary Least Square (OLS). The model used in this research based on production theory. The general form of the production function is able to be written as the following:

$$Q = f(K, L) \dots\dots\dots(2.1)$$

Q= Output, K= capital, L= labor

The production function model in equation (2.1) above is transformed into a lagrangian equation form for obtaining the labor demand function which is the following:

$$Q = f(K, L) \dots\dots\dots(2.2)$$

$$\text{Minimum } c(w, r, Q) = \min w L + r K$$

$$\text{Subject to } Q = f(K, L)$$

The production function in equation (2.2) is transformed into another lagragian function so the form of the equation becomes:

$$i = w L + r K + \lambda [Q - f(K, L)] \dots\dots\dots (2.3)$$

The first derivatives (first-order conditions) from equation (2.3) above to K, L and λ are as the following:

$$w - \lambda f_l = 0 \dots\dots\dots (2.4)$$

$$r - \lambda f_k = 0 \dots\dots\dots (2.5)$$

$$Q - f(K, L) = 0 \dots\dots\dots(2.6)$$

From equations (2.4) and (2.5) is obtained:

$$\frac{w}{r} = \frac{\lambda f_l}{\lambda f_k} \dots\dots(2.7)$$

$$K = \frac{w}{r} \cdot L \dots\dots(2.8)$$

Equation (2.8) substituted to equation (2.6)

$$Q = f(K, L)$$

$$Q = \left(\frac{w}{r}\right) \cdot L$$

$$Q = \frac{w}{r} L^2$$

$$L^2 = \frac{Q}{W/r}$$

$$L = \sqrt{\frac{Q}{W/r}} \dots\dots(2.9)$$

$$Ld = F(r, w, Q) \dots\dots(2.10)$$

$$Ld = F(r^+, w^-, Q^+) \dots\dots(2.11)$$

Where: C cost, r = price from capital (interest level), K = capital, w = price from labor (wage),

L = number of labor, Q = production Ld = demand of labor, i = lagrange equation and λ = artificial variable.

The equation (2.10) above is transformed into a linear regression form by using logarithm (Ln), the form of the equation becomes as the following:

$$\text{Ln LD} = \alpha + \beta_1 \text{LnR} + \beta_2 \text{LnQ} + \beta_3 \text{LnW} \dots\dots(2.12)$$

The equation above os able to be written in a linear regression form as the following :

$$\text{Ln LD} = \beta_0 + \beta_1 \text{LnR} + \beta_2 \text{LnQ} - \beta_3 \text{LnW} + \varepsilon \dots\dots\dots(2.13)$$

Explanation:

LD = The number of labor absorption in

small business enterprises and the unit of measure in persons

R = capital in small business enterprises and the unit of measure is in rupiah

Q = the number of labor productivity in small business enterprises and the unit of measure is in rupiah

W = labor salary in small business enterprises and the unit of measure is in rupiah

A = constant

B = coefficient

III. RESULTS AND DISCUSSION

3.1. AEC Competitiveness

Publications by the International Labor Organization (ILO) mentions that the productivity of Brunei Darussalam has the highest labor productivity value with a value of \$100,015 then followed by \$ 98,072, Malaysia \$35,751, Thailand \$14,754 and Philippines \$10,026. The productivity competitiveness of Indonesia is ranked sixth after the Philippines with a productivity value as large as \$9,848 and it is still better compared with Vietnam and Cambodia. The counting is implemented based on constant values in 2005 and its development in 2013.

Table 1: ASEAN Labor Market Indicator 2014

Country	Workforce (000s) ^(a)	Education and skill development			Average Monthly Wages (\$)	Labor Productivity (Constant Numbers 2005 (\$))
		Literacy Rate 15 years and over (%)	TVET (number of admissions) (%)	Higher Education Admissions (%)		
Brunei Darussalam	186	95.4	11.4	24.3	...	100,015
Cambodia	7,400	73.9	2.3	15.8	121	3,989
Indonesia	118,193	92.8	18.0	27.2	174	9,848
Lao PDR	3 080	72.7	0.8	16.7	119	5,396
Malaysia	13,785	93.1	6.8	36.0	609	35,751
Myanmar	30,121	92.7	...	13.8	...	2,828
Philippines	41,022	95.4	...	28.2	206	10,026
Singapore	3,444	95.9	11.6	...	3 547	98,072
Thailand	39,398	93.5	15.4	51.4	357	14,754
Viet Nam	53,246	93.4	...	24.6	181	5,440

Source: ILO 2015

Towards the ASEAN Economic Community the competition of labor is determined by the productivity value of labor in each country, because the mentioned value reflects the ability of a nation's labor in producing goods and service products. Observed from the results of this publication, the competitive position of Indonesia's labor in facing the ASEAN Economic Community is in a position below

the average of developed countries in the ASEAN region.

3.2. The Number of Small Business Enterprises

Small Business Enterprises in Aceh Province total at 1,862 business units that spread in 81 regencies/cities (BPS Aceh, 2015). Locations in regencies influence the number of small business enterprises, this is able to be seen in Table 2.

Table 2. Developing numbers of small business enterprises of Regencies/Cities in Aceh Province 2014

No.	Regency/City	The Number of Small Business Enterprises (unit)	Percentage of the Province (%)
1	Simeulu	8	0.43
2	Aceh Singkil	20	1.07
3	Aceh Selatan	74	3.97
4	Aceh Tenggara	29	1.56
5	Aceh Timur	46	2.47
6	Aceh Tengah	17	0.91
7	Aceh Barat	39	2.09
8	Aceh Besar	40	2.15
9	Pidie	416	22.34
10	Bireuen	255	13.69
11	Aceh Utara	197	10.58
12	Aceh Barat Daya	17	0.91
13	Gayo Lues	165	8.86
14	Aceh Taming	36	1.93
15	Nagan Raya	21	1.13
16	Aceh Jaya	14	0.75
17	Bener Meriah	3	0.16
18	Pidie Jaya	303	16.27
19	Banda Aceh	67	3.60
20	Sabang	30	1.61
21	Kota Langsa	35	1.88
22	Lhokseumawe	28	1.50
23	Subulussalam	2	0.11
	Provincial Total	1862	100.00
	Average Regency/City	81	

Source: BPS Aceh 2015

Based on table 2, the largest number of small business enterprises in Aceh Province is in Pidie as many as 416 small business enterprises, followed by Pidie Jaya as many as 303 units or as large as 16.27 percent and third place is achieved by Bireun regency which is as many as 255 units or 10.8 percent. The regency with the smallest number of small business enterprises is Simeulu Regency with a total of 8 units or 0.43 percent.

The number of small business enterprises in a regency is influenced by private investment conditions, pushed by entrepreneurial spirit of the people and the role of the government that supports the people's economic activities. The higher entrepreneurial spirit of the people, can make higher the growth of micro and small businesses. This is seen in Pidie Regency and Pidie Jaya, generally people that are from Pidie (Pidie Regency and Pidie Jaya)

are people that have a high entrepreneurial spirit. Strengthened by the opinion of Selo Sumardjan in the book (Ishak Hasan made business of grassroots 2013) “many of the Pidie people are capable in trading (making business), and only a few that enjoy working as farmers, they wander individually not as a group”.

3.3 Food and Beverage Small Business Enterprises

If observed from the distribution of food and beverage industry types, the industry that has the most interest by businessmen is the cake industry, followed by melinjo chips, banana chips, where the number of industries is greater than 10 units. This is illustrated in Figure 1 below.

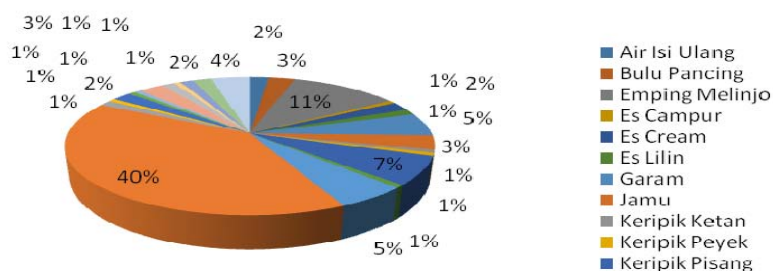


Figure 1 Distribution of Food and Beverage Industry Types in Aceh Province

Based on Figure 1, it is able to be seen that the business that is most distributed is the cake type business with a total as large as 40% from the total businesses reaching 149 business units. This is a sign that the business opportunity of cakes is the largest opportunity compared to other businesses in Aceh Province today.

3.4. Number of Labor Absorption in Small Business Enterprises

The number of labor absorption is the number of labor that has already worked in the food and beverage industry sector. The number of labor absorption is much varied in a business, where the number of labor starts from 1 person in labor up to 15 people in labor, this is seen in Table 3 below:

Table 3. The Number of Labor Absorptions in the Food and Beverage Industry in Aceh Province 2014

No	Number of Labor	Frequency	Percent (%)
1	1 Person	13	8.72
2	2 Persons	44	29.53
3	3 Persons	35	23.49
4	4 Persons	37	24.83
5	5 Persons	5	3.36
6	6 Persons	3	2.01
7	7 Persons	1	0.67
8	8 Persons	3	2.01
9	9 Persons	2	1.34
10	10 Persons	1	0.67
11	11 Persons	1	0.67
12	12 Persons	2	1.34
13	15 Persons	2	1.34
	Total	149	100

Based on table 3 above it is able to be seen that the largest absorption of labor, which is 15 persons, only happen in 2 business units, while the labor absorption at most used by businesses are 2 persons in labor with a number of businesses reaching 44 business units and the least which are 7 persons, 10 persons, and 11 persons each 1 business unit. If seen from the absorption of labor in the food and beverage industry.

If the observed from the number of labor absorption distribution, the absorption of labor with a total of 1-4 persons that are absorbed most where the largest are 2 persons with a total number of

businesses reaching 29.53% followed by the number of 4 persons as large as 24.83% and the last with a number of 4 persons at 23.49%.

3.5. Labor Salary in Food and Beverage Small Business Enterprises

The amount of labor salary in a business is highly influenced by the number of labor used by a business. This is because if the labor that is used is in a large amount and the total production value produced is small, the mentioned business is unworthy of using labor in a large amount. This is able to be seen in the Table 4.

Table 4. Labor Salary in Food and Beverage Industry in Cities in Aceh Province 2011

No.	Labor Salary	Frequency	Percent
1	< 631,249	37	24.83
2	631,250 – 712,499	58	38.93
3	712,500 – 793,749	24	16.11
4	793,750 – 874,999	22	14.77
5	875,000 – 1,037,499	2	1.34
6	1,037,500 – 1,118,749	2	1.34
7	> 1,118,750	4	2.68
	Total	149	100

Based on Table 4 above it is able to be seen the amount of salary that are issued by businessmen for paying labor salary where the highest salary number is Rp.1,200,000. There are only 4 businesses that give salary as large as Rp.1,118,749 per month while the most is Rp.712,499 per month with the number of businesses reaching 58 units. If seen from the curve below, the largest portion which is as large as 38.93 percent is in the wage level of Rp.631,250 – 712,499 per month.

3.6. Business Capital in Food and Beverage Small Business Enterprises

Business capital is an important component in a business, where with a large capital businessmen are able to spend according to business needs, this is influenced by the type of business that will be built, because of that, the larger the business, the capital that is used is also larger. For observing the distribution of the

mentioned business capital, it is able to be seen in Figure 2.

Based on Figure 2, it shows that the total distribution other than the 91% of business uses a business capital as large as < Rp.26,418,749, the rest which is as large as 9 percent Rp.26,418,750 – Rp.178,631,250.

3.7. The Production Value in the Food and Beverage Small Business Enterprises

The production values that were produced from food and beverage enterprises were the results of product sales in a 1 year period. As for this production value shows that products produced by the food and beverage industry are responded well by consumers so it will influence the amount of production value in an industry. If seen from the production levels in the food and beverage industry, it is able to be grouped to 6 levels of production values as seen in Figure 3 below.

Based on Figure 3, it shows that the largest distribution of production values which is < Rp.14,693,624 per year as large

as 89% and the rest as large as 11% which starts from Rp.14,693,625–Rp.68,468,125 per year.

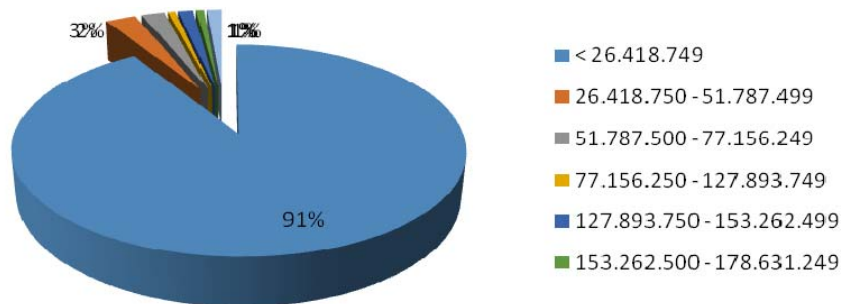


Figure 2 Business Capital in the Food and Beverage Industry Aceh Province 2011

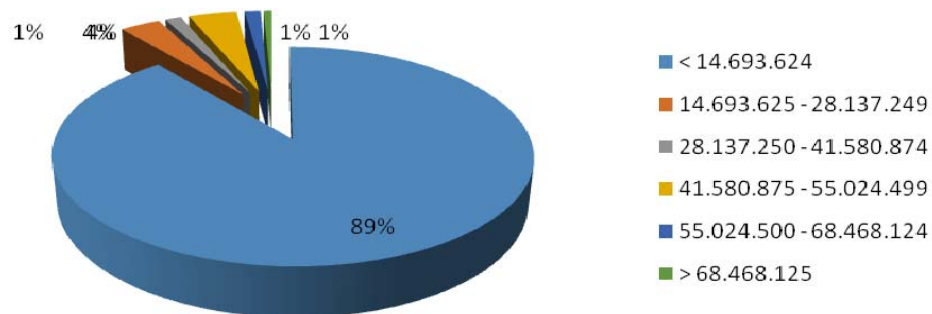


Figure 3 Production Values in the Food and Beverage Industry in Aceh Province Year 2014

3.8. Data Analysis Results

Based on the result of the Normality test analysis, it is seen that data distribution approaches the diagonal line, so it is able to be declared that this research’s data shows normality (Fig. 6).

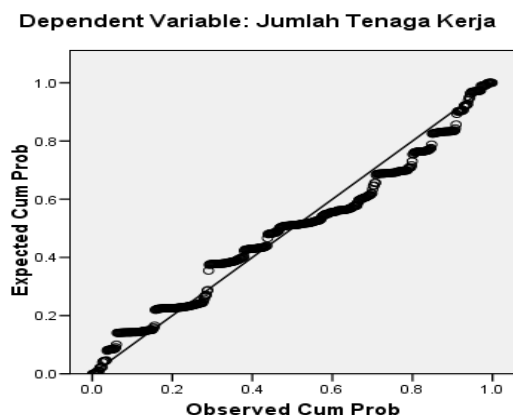


Figure 6 Scatter Plot Normality Test

From the count on Table 5 we are able to know that the VIF value and tolerance are as the following:

1. The Level of Labor Wage Variable has a VIF value as large as 1.194 and tolerance as large as 0.837.
2. The Production Value Variable has the values VIF 1.279 and tolerance as large as 0.782.
3. The Business Capital Variable has a VIF value as large as 1.154 and tolerance as large as 0.867.

From the present determinations which if $VIF < 10$ and $tolerance > 0.10$, a multi collinearity symptom does not happen and values obtained from the count are in accordance with determined VIF values and tolerance, so it is able to be summarized that the mentioned regression mode does not show the presence of multi collinearity symptoms.

From the output on Table 6 is able to be known that the variables labor wage level, labor production value and business capital do not have heterocedastity symptoms because $Sig. > 0.05$.

Table 5. Results of Multicollinearity Test Analysis

Independent Variable	Tolerance	VIF	Remarks
Wage Level	0.837	1.194	Non Multicollinearity
Production Value	0.782	1.279	Non Multicollinearity
Business Capital	0.867	1.154	Non Multicollinearity

Source : Processed data (archives)

Table 6. Results of Multiconiarity Data Test

Model		Unstandardized Coefficients		T	Sig.
		B	Std. Error	Partial	
1	(Constant)	-.774	1.791	-.432	.666
2	Labor Wage Level	.105	.143	.733	.465
3	Production Value	-.015	.026	-.563	.574
4	Business Capital	-.005	.020	-.250	.803

For observing how far the influences of salary level, production value and business capital to the absorption of labor with the final estimator count as the following:

$$\text{LnLD} = -4.758 + 0.150 (\text{Ln W}) + 0.224 (\text{LnQ}) + 0.021 (\text{Ln R})$$

From the model above there is one variable that significantly influences dependent variables partially. The mentioned variable is Production Value. While the two other independent variables that are not significant influences dependent variables partially which are, X1 (wage levels) and X2 (business capital).

LnLD = Dependent variable which the value will be predicted by independent variables. In this research that will become the

dependent variable is Labor Absorption
 C = (Constant) valued at -4.758 which means when LnW, LnQ, and LnR =0 the Unemployment Level increases as large as 4.758 percent that is caused by workforce growth.
 B2 = The Ln Q variable which the probability is as large as 0.000 < 0.05 which means the Production Value variable partially and significantly influences labor absorption. The value of the Ln Q coefficient as large as 0.224 means that when there is an addition of production values as large as 1 percent , this will increase the income of fishermen as large as 0.224 percent.

Table 7. Regression Coefficient

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	-4.758	2.925		-1.626	.106
Labor Salary	.150	.233	.051	.643	.521
Labor Productivity	.224	.043	.431	5.217	.000
Capital	.021	.033	.052	.659	.511

Dependent Variable: The Number of Labor

Based on the results of the F test (simultaneously) an F_{count} of 14.046 is obtained while the F_{table} in a significance

level of 8 = 5% is as large as 2.67. This shoes that F_{count}>F_{table}with a significance level of 0.0001. So it is able to be declared

that wage (X_1), production values (X_2) and labor capital (X_3) simultaneously influence absorption to labor absorption (Y) in small

business enterprises for the food and beverages sector in Aceh Province.

Tabel 8. ANNOVA

Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	7.428	3	2.476	14.046	.000 ^a
Residual	25.560	145	.176		
Total	32.988	148			

- a. Predictors: (Constant), Capital, Labor salary, Labor Productivity
 b. Dependent Variable: The Number of Labor

Based on analysis, results a coefficient determination (R^2) as large as 0.225 is obtained. This means that changes as large as 22.5% in dependent variables (labor absorption) is able to be explained by changes in the wage level, production value,

and business capital factors. While the rest which is as large as 77.5% is able to be explained by other factors outside of the research variables such as the above explanation.

Table 9. Correlation Coefficient

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.475 ^a	.225	.209	.41985

- a. Predictors: (Constant), Capital, Labor salary, Labor Productivity
 b. Dependent Variable: The Number of Labor

The Influence of Production Values to Labor Absorption

The amount of the regression coefficient of the Production Value is 0.224 has a meaning that if this variable increases 1%, labor absorption will increase as much as 0.224% with the assumption that other variables are constant. So the relation of production value with labor absorption is positive and influences significantly to small business enterprises for the food and beverage sector in Aceh Province.

This significant influence contains a further understanding that production values in small business enterprises in this food and beverage subsector influences the small businessmen party to determine the number of labor that are used in production. While the positive relation in this regression result shows that if production values raise, the number of labor, neither labor that have skill nor less skilled labor that are used in the production process will also increase, because an increase in production values reflect an increase in total production with the assumption that the price of products are still fixed. In accordance with

the theory that for increasing output an increase in the input that is used is needed, in this context, it is labor. So the higher the labor productivity, the higher the total of goods produced with the assumption that other production factors are fixed, the production value will also increase.

In accordance with the research of Adrianto (2013) that implemented a research about factors that influence labor absorption in small business enterprises in Mojokerto Regency shows that production value is a factor that influences labor absorption in small businesses.

The Influence of Labor Salary Levels to Labor Absorption

Results of research to the labor wage variable (X_1) a t_{count} value as large as 0.643 is obtained, while the t_{table} value is as large as 1.976. This result shows that $t_{count} < t_{table}$ with a significance level of 0.521. Therefore statistical count results show that partially the labor wage variable (X_1) does not influence significantly to the absorption of labor in the food and beverage industry.

This insignificant relation is caused by the partial labor in the food and beverage sector in Aceh Province are household businesses, generally the labor consists of family elements that will drive the industry in the food and beverage business, other than that, food and beverage industry businessmen in Aceh pay salary based on the production and productivity of labor, the more productive, the greater their income. This is the cause why salary are insignificant to labor absorption in Aceh. Then small business enterprises in the food and beverage industry in Aceh Province if they convert into manufacturing industries, there will be an influence between labor absorption and wage levels.

The Influence of Business Capital to Labor Absorption

The amount of regression coefficient of business capital is 0.021 with a significance level of 0.511 or greater than 0.05 which means that the value does not have a significance between the addition of capital with labor absorption in food and beverage small business enterprises in Aceh Province.

Showing that small business enterprises in the food and beverage subsector in Aceh Province, labor absorption is not influenced by capital addition, because capital addition is more in the effort of total production increase through the addition of raw materials, machine and technology usage compared with the usage of labor, for changing the ways of production to a more modern direction for increasing total production and labor productivity.

IV. CONCLUSION

Based on analysis results of factors that influence labor absorption in the small business enterprise sector in the food and beverage industry in Aceh Province we are able to summarize that: (1) Indonesian labor productivity competitiveness is in sixth place. The cause is because of the low levels of education and training, the average wage is also very low, (2) Analysis results above show that production values

influence labor absorption in small business enterprises subsector food and beverages in Aceh Province, yet production values influence positively to labor absorption in small business enterprises for food and beverages in Aceh Province. However the level of wage and capital does not influence significantly to labor absorption in small business enterprises for food and beverages in Aceh Province, (3) For increasing the absorption of labor in Aceh Province, what has to be done is to increase business production values, because of that a growth in the food and beverage industry is needed to increase labor absorption through investment increases, cheap credit awarding in small business enterprises and the expansion of the production market so production values are able to increase.

REFERENCES

- Amri A. 2007. The Influence of Inflation and Economic Growth to the Unemployed in Indonesia. *Jurnal Inflasi dan Pengangguran*.
- Adrianto Rizky. 2013. *Analysis of Factors that Influence Labor Absorption in Small Business Enterprises (Case Study in the Rambak Chips Industry in Bangsal Village, Bangsal District, Mojokerto Regency)*
- BPS. 2010. *Small Business Enterprises*. BPS: Jakarta.
- BPS. 2015. *Social Economic Data, 60th edition*. BPS.: Jakarta.
- BPS. 2015. *Social and Economics of the Aceh People BPS Aceh*: Aceh Province.
- Dumary, 2001. *Perekonomian Indonesia*. Airlangga. Jakarta
- (ILO), 2015. *ASEAN Community 2015*. ILO and ADB. Bangkok, Thailand
- Mulyadi S. 2003. *Ekonomi Sumber Daya manusia dalam Perspektif Pembangunan*. PT. Raja Grafindo Persada: Jakarta.
- Partomo TS, Soejoedono AR. 2004. *Ekonomi Skala Kecil/Menengah dan Koperasi*. Ghalia Indonesia: Jakarta.
- Sukirno S. 2005. *Mikro Ekonomi Manajemen SDM, Ketenagakerjaan*. Graha Ilmu: Yogyakarta.

VOCATIONAL TEACHER ROLE IN PREPARING STUDENTS IN THE ASEAN ECONOMIC COMMUNITY ERA

Hasanah; Muhammad Yahya; Muhammad Nasir Malik

Faculty of Engineering, University of Makassar
hasanahunm@yahoo.com; yahya.ftunm@gmail.com; nasir_tadaga@yahoo.com

ABSTRACT

Teachers have a role and responsibility of preparing students to face the era of the ASEAN Economic Community (AEC). Currently it takes creative people who can live independently and always ready for change. Creative people are required to realize the nation's character is tough and ready to compete with the changing times. Roles and responsibilities of vocational teachers should be more dynamic and creative in developing learning. Therefore, the role of Master Courses in preparing qualified students is needed. Therefore, vocational teacher must have a number of capabilities, namely: (1) as a planner to prepare the learning process; (2) as the executor should be able to create a pleasant learning situations, be a good facilitator, motivator, initiator, and director of learning activities; (3) as an appraiser who must collect, analyze, interpret and ultimately must give due consideration to the level of success of the learning process, based on defined criteria. Roles and responsibilities of vocational teachers should be more dynamic and creative in developing learning. Learning paradigm changes from Teacher to Student Centre Learning encourages students more active, independent, creativity appropriate development of learners. Teacher's Role in the Student Centered Learning approach is as a motivator, facilitator, and inspiration.

Keywords: vocational teacher, creative, motivator, facilitator, inspiration.

I. INTRODUCTION

This current era of globalization brings new phenomenon, namely competition in cooperation. Various goods that the market is a product of the cooperation are complementary and mutually beneficial inter-state, inter-industry of various countries. One challenge is the quality of human resources (HR) to compete. Therefore, educational institutions must innovate so that graduates are able to compete in the era of the ASEAN Economic Community (AEC). Based on the Strategic Plan of the Ministry of Education and Culture 2015-2019 the achievement of Human Development Index (HDI) Indonesia experienced an increase in ranking from number 128 to 124 out of 185 countries. However, when compared to ASEAN countries such as Singapore which is ranked 9, 62 rankings Malaysia and Brunei Darussalam ranked 30th, means that Indonesia is still far behind. The low quality of human resources (HR), narrowing the space for Indonesian workers. The data showed the decline in the competitiveness position of Indonesian workers compared to

workers from Asian countries. Labor conditions in Indonesia is still colored by the higher unemployment rates, for educational institutions continue to add graduates job seekers is not the creator of the work.

One strategy to increase human resources (HR) is through education, as well as the Vision of National Education, namely: Article 3 of Law No. 20 Year 2003 on National Education System, that "The realization of the education system as a social institution that is strong and authoritative to empower all Indonesian citizens develop into a human quality so capable and proactive answer the ever-changing challenges of our time".

The era of globalization and development of information technology has caused changes very fast in all areas. Limitation of regions, languages and cultures are increasingly thinner, and access information more easily lead to knowledge and expertise gained one becomes quickly obsolete. Increasingly intense competition due to globalization and the economic conditions facing many difficulties, especially in Indonesia, human resources requires a

creative, independent, entrepreneurial spirit and leadership. Education emphasizing only on the process of knowledge transfer was no longer relevant, because it will produce human resources who master the science of the past, without being able to adapt to the needs of the present and the future.

Vocational education and training as the kind of education that prepares students to enter the workforce will be able to become a learning partner of the government in reducing unemployment and even produce human resources productive if managed productively. Vocational High School (VHS) the main objective of setting up a skilled workforce, professional, and disciplined in accordance with the demands of the working world. Interest is listed in Education Law article 15 which says special purpose VHS is to prepare students to become productive human beings, able to work independently, to fill vacancies that exist in the business world and the industrial world as a middle-level manpower in accordance with competence in the skills program chosen, one attempt to do this is to improve the quality of learning.

A paradigm shift in the learning process that had been centered on the teacher (Teacher Centre Learning) be centered learning on the learner (Student Centre Learning) is expected to encourage students to be actively involved in building the knowledge, attitudes and behavior. In the process of the Student Centre Learning, learners have the opportunity and facilities to build their own knowledge, so that they will gain a deep understanding, and

ultimately to improve the quality of graduates.

The learning process Student Centre Learning can improve the quality of human resources required by the community such as creativity, leadership, self-confidence, self-reliance, self-discipline, critical thinking ability to communicate and work in teams, technical expertise, and global insight to be able to adapt to changes and developments science and technology. With the changing times and turnaround time, the future of the nation depends on the condition of the younger generation today. Roles and responsibilities of teachers to prepare students face the era of the ASEAN Economic Community. Currently it takes creative people to live independently and be ready for change. Creative people will realize the nation's character is tough and ready to compete with the changing times. Therefore, the role of Master Courses in preparing qualified students is needed.

II. RESULT AND DISCUSSION

2.1. Learning Paradigm Shift

A change of paradigm in learning should receive serious attention from all players in education, especially teachers. As, on the National Education Standards No. 32 of 2013 states that: "The process of learning in the educational unit organized in an interactive, inspiring, challenging, motivating the students to actively participate and provide enough space for innovation, creativity, and independence in accordance with their talents, interests, and physical and psychological development of learners.

Table 1: Changes Paradigm Learning

No	ASPECT	<i>Teacher Centre Learning</i>	<i>Student Centre Learning</i>
1	Knowledge	Knowledge is seen as something that is so, just move (transfer) from the teacher to the learner	Knowledge is the result of construction (formation) or transformed from someone who learned
2	Learn	Receive knowledge (passive receptive)	Learning is finding and constructing (forming) active knowledge and specific way
3	Teacher	Teach Delivering knowledge (usually classical) Running an instruction that has been designed	Facilitate, motivate, and inspire Participate with learners build knowledge Running various strategies which help learners to learn

(Source: LPP UNS, 2010)

Thus any educational institution doing the learning plan the implementation of the learning process and learning assessment to improve the efficiency and effectiveness of the achievement of competencies of graduates (PP No. 32 of 2013). A paradigm shift in the learning process which initially centered on the teacher (Teacher Centre Learning) into the learning centered on the learner (Student Centre Learning) is expected to encourage students to be actively involved in building the knowledge, attitudes and behavior. Change of paradigm in learning from Teacher to Student Centered Learning Centre Learning viewed from several aspects, can be seen in Table 1.

Paradigm shift learning from TCL to SCL can change the quality of education in Indonesia. This paradigm shift is not to mention how teachers teach well, but how students learn best. Teacher as facilitator and motivator in learning has an important role in creating high quality graduates. Education requires accordance in innovations with the progress of science and technology give birth to beings who are intelligent, creative, skilled, responsible, productive, independent and noble character. The changing learning concept from TCL to SCL implications for the improvement of the quality graduates. Change that paradigm, can be described as in Figure 1 below:

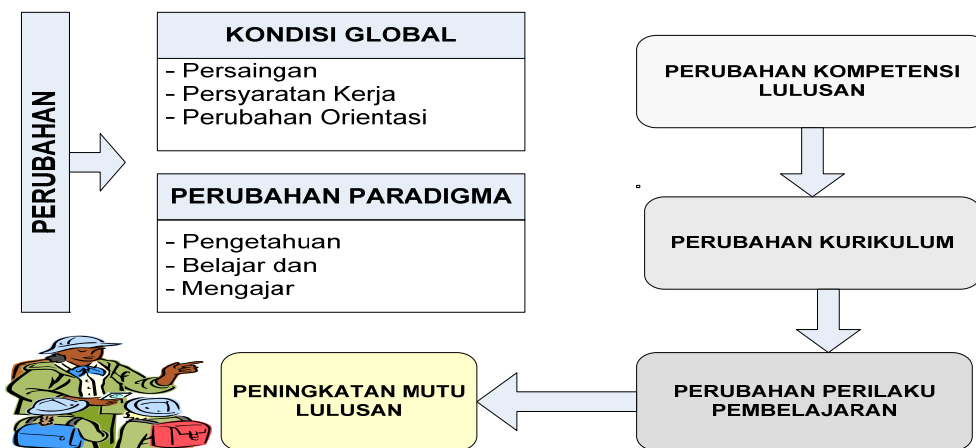


Figure 1: Change the learning paradigm

2.2. Student Centre Learning (SCL)

Understanding Student Centered Learning (SCL) is a learning process that had focused on the teacher to be a learning centered on the learner (learner centered) is expected to encourage students to be actively involved in building the knowledge, attitudes and behavior. Through the process of learning that learners are actively involved, means that teachers no longer take the right of a student to learn (<http://www.psychologymania.com/html/akeses/2/12/2015>).

Innovative methods learning SCL has a variation model of learning that requires the active participation of the learner. Such methods include the following: (a) Sharing information (Information Sharing) by:

brainstorming, cooperative, collaborative, group discussion, panel discussions, symposia, and seminars; (b) Learning from experience (Experience Based) by means of simulation, role play, games; (c) Learning through Problem Solving (Problem Solving Based) by: The case studies, tutorials, and workshops. SCL based learning requires active learners, as well as discussions with the teacher as a facilitator if difficulties. Active learners are expected to foster a sense of creativity of learners (Reza Rindy Antika, 2014: 254).

Through the application of SCL learners must participate actively, constantly challenged to have a critical power, able to analyze and solve its own problems. The challenge for teachers as a learning

companion, to be able to apply the learning centered on the learner need to understand the concepts, mindset, philosophy, commitment methods and learning strategies. To support the teacher competency in the learning process centered on learners will require an increase in knowledge, understanding, expertise, and skills of teachers as facilitators of learning. Role of Teachers in a shift from the original learner teacher (teacher) become facilitators (Dimiyati, 2009). Illustration with SCL approaches such as Figure 2).

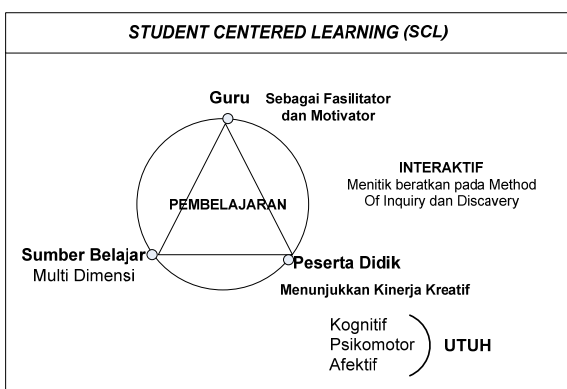


Figure 2: Approach to Student Centered Learning

Student Centered Learning has the potential to encourage students to learn more actively, independently, in accordance with the development of learners who need to be guided in order to continue the dynamic and have a high level of competence. Some learning model SCL, namely: (a) Small Group Discussion (SGD); (b) Role Play and Simulation; (c) Discovery Learning; (d) Self-Directed Learning; (e) Cooperative Learning; (f) Contextual Learning (CTL); (g) Problem Based Learning (PBL); (h) Collaborative Learning (CBL); and (i) Project Based Learning (PBL). Selection of the learning model, adapted to the given learning material, but for vocational schools (VHS) particularly productive subjects, then the appropriate learning models, among others: (a) Contextual Teaching and Learning (CTL); (b) Problem Based Learning (PBL); and (c) Project Based Learning (PBL) or a combination of several models. The role of vocational teachers should be able to innovate in selecting the model and or learning methods.

2.3. Contextual Teaching and Learning

According to Sagala (2010: 86) that a contextual approach (Contextual Teaching and Learning) abbreviated CTL is a concept of learning that help teachers link between what is taught with real-world situations learners and encourages students to make connections between the knowledge possessed by the application in their lives as a member of the family and society. Therefore, the outcome is expected to more meaningful learning and learning process takes place naturally in the form of activities learners work and experience, not a transfer of knowledge from the teacher to the learner.

Furthermore, according to Kunandar (2007: 293) that a contextual approach (CTL) is a concept study assume that children will learn better if the environment is created naturally, meaning that learning will be more meaningful if the child's "work" and "experience" itself what he learned , open just "know". Learning is not just a transfer of knowledge from teacher to student, but how the student is able to interpret what he learned. According to Elaine B. Johnson (2010) that a contextual approach has seven major components, namely: (1) Constructivism; (2) inquiry; (3) questioning); (4) community learning; (5) modeling; (6) reflection; and (7) authentic assessment.

Learning more meaningful if the child has what he learned, not knowing (Sagala, 2010: 87). Target-oriented learning mastery of the material proven to be successful in the competition since in the short term, but fail to provide children solve problems in the long-term life. The step-scarcity contextual learning as follows:

First, constructivism, namely the learning phase begins with an exploration of knowledge and experience that has been owned by the students, from what has been seen, heard, or experienced by previous students. Develop the idea that children learn in a more meaningful manner his own work, find themselves, and construct their own knowledge and new skills.

Second, find the (inquiry), which is conducting inquiry directly related to learning materials. For example, how is to develop an entrepreneurial spirit or

observing the behavior of a successful entrepreneur.

Third, ask (questioning), which develop inquisitive learners to ask questions. Or using the key question, such as: how to develop new business.

Fourth, learning community the discussion group. Students were asked to discuss in groups each, and make a note of the results of field observations, constraints, a comparative study of their work with other groups, and the techniques used. With such diverse study groups they will learn from each other. Furthermore, representatives of the group were asked to briefly present the results of their discussion. Teachers summarize and conclude all the results of the discussion in the meeting.

Fifth, create a model (modeling), which present the model as an example of learning. For example, a successful entrepreneur presented to explain the success tips trying them. Selection models should also be adjusted with the material and majors that are in the travel learners. Furthermore, students produce a work, either in the form of ideas, goods, or services.

Sixth, reflection (reflection), which is at the end of the meeting students were asked to reflect or appreciate the learning experience, both orally and in writing in the form of a brief. Comments learners can be used to improve the quality of learning.

Seventh, authentic assessment, the last step is to conduct assessments (evaluations) actual (authentic assessment) in various ways, namely portfolio assessment work, the attitude of learners during group work, the level of creativity and innovation, and performance assessment.

2.4. Problem Based Learning

Life is synonymous with trouble. This learning model to train and develop the ability to solve the problem of authentic problem oriented than the actual life of the students, to stimulate high-level thinking skills. Conditions that remain to be maintained is a conducive atmosphere, open, negotiation, democratic, comfortable and pleasant atmosphere so that learners can think optimal.

Indicators of this model are: the elaboration (analysis), interpretation, induction, identification, investigation, exploration, conjecture, synthesis, generalization, and inquiry. With this method teacher should: (1) Stimulate the task of learning with a variety of alternative methods of solving problems (2) a facilitator and motivator. While learners (1) Learning to dig or search for information (inquiry), as well as capitalize upon the information to solve the problems being faced factual, (2) analyzing the problem-solving strategies.

2.5. Project Based Learning

This learning method is to provide project tasks that must be completed by learners to find the source his own of library. With this method Teachers must, (1) to formulate the task and the process of coaching and assessment, (2) As a facilitator and motivator. While learners (3) Working on assignments that has been designed to systematically (4) shows the performance and be accountable for the work of the forum.

Vocational Teacher's Role in the Process of Learning Teachers according to Law No. 14 of 2005 explains that "teachers are professional educators with the primary task of educating, teaching, guiding, directing, train, assess, and evaluate students on early childhood education, formal education, primary education and secondary education. "New developments to the views of teaching and learning consequences for teachers to improve the role and competence for teaching, learning and learning outcomes of students are largely determined by the role and competence of teachers. Competent teachers will be able to create an effective learning environment and manage the classroom so that the study of students at the optimum level.

The quality of teaching good, it will produce good learning outcomes anyway. Rusman (2012: 148) in the learning system teachers are required to be able to select appropriate learning methods, able to select and use learning facilities, capable of selecting and using evaluation tools, able to manage learning in the classroom and in the laboratory, mastering the material, and

understand the character of participants learners. One of the demands of the teacher is able to select appropriate learning methods to teach. If the teaching methods teachers use it right then the achievement of learning objectives would be more easily achieved, so that the value of mastery learning learners will increase, interest and motivation of learners will also increase and will create a pleasant learning atmosphere.

According to the Vienna Sanjaya (2007: 2) that one teacher has a very important role among others: (1) the teacher as a learning resource; (2) the teacher as a facilitator; (3) the teacher as a manager; (4) the teacher as demonstrator; (5) teachers as mentors; (F) the teacher as motivator; and (g) the teacher as evaluator. However, in its development approach Teacher Centered Learning (TCL) no longer correspond to what happened in real life. TCL is an approach that rated looked all learners alike. For some conditions TCL activity is already pretty good, but when dealing with the conditions of learners who have a different character, then this paradigm is no longer appropriate applied.

The learning process that occurs should use constructive approach, which emphasizes learning process that learners in the learning process must be actively construct knowledge individually and not just take it for granted the knowledge gained (Elaine B. Johnson, 2010). SCL learning approach emerged as an alternative learning approach to address issues mismatches TCL approach. In the SCL approach to learning, teachers must be able to perform their role is not only as a teacher, but also as a motivator, facilitator and innovator. Teachers are not only required to teach only in class but also actively assist learners to solve the current problems of students experiencing difficulties in the learning process.

Vocational Teacher role in preparing learners facing the era of the ASEAN Economic Community, especially through the learning process should be based on the National Education Standards. Regulation of the Minister of Education and Culture No. 65 of 2013 on the Standard Process Primary and Secondary Education, mandates that the process of learning in the educational unit

must be held in an interactive, inspiring, fun, challenging, motivating the students to actively participate and provide enough space for the initiative, creativity, and independence in accordance with their talents, interests, and physical and psychological development of learners. Therefore, the standard is a guideline, or the steps of learning in the classroom to be implemented by teachers, with the hope of learning process can be both effective, efficient and innovative, so that the learning objectives and criteria of competence of graduates can be achieved perfectly. Thus, the role of vocational teachers will determine the quality of learners.

III. CONCLUSION

Based on studies that have been described, it can be concluded several things, including: (1) The role of vocational teachers in preparing learners is needed in the era of the ASEAN Economic Community, (2) Vocational teacher must have the ability to plan, implement and evaluate learning, so that learners can develop their potential to the maximum, (3) Student-Centered Learning has the potential to encourage students to learn more actively, independently, in accordance with the rhythm of learning of each, according to the development of learners, and learners need to be guided in order to continue the dynamic and have a high level of competence, (4) Teachers in the teaching approach Student-Centered Learning should be able to carry out their role is not only as a teacher, but also as a motivator, facilitator and innovator.

REFERENCES

- Badan Standar Nasional Pendidikan . 2010. *Paradigma Pendidikan Nasional Abad XXI*. Jakarta: BNSP
- Diknas. 2013. *Peraturan Pemerintah Nomor 32 Tahun 2013 tentang Standar Nasional pendidikan (SNP)*. Jakarta
- Dimiyati. 2009. *Belajar dan pembelajaran*. Jakarta: Rineka Cipta
- Johnson, Elaine B. (2010). *Contextual teaching and learning: What it is and why it's here to stay*. California: Corwin Press, Inc.

- Kemendikbud. 2015. *Rencana Strategis Kementerian Pendidikan dan Kebudayaan Tahun 2015-2019*. Jakarta
- Kunandar. (2007). *Guru Profesional: Implementasi kurikulum tingkat satuan pendidikan (KTSP) dan sukses dalam sertifikasi guru*. Jakarta: PT Rajagrafindo Persada.
- Panen, P, Mustafa D & Mestika Sekarwinahyu. (2001). *Konstruktivisme dalam pembelajaran*. Jakarta: PAU-PPAI Universitas Tebuka
- Permendikbud. 2013. *Peraturan Menteri Pendidikan Dan Kebudayaan Republik Indonesia Nomor 65 Tahun 2013 Tentang Standar Proses Pendidikan Dasar Dan Menengah*
- Reza Rindy Antika. 2014. *Proses Pembelajaran Berbasis Student Centered Learning (Studi Deskriptif di Sekolah Menengah Pertama Islam Baitul 'Izzah, Nganjuk)*. *Jurnal BioKultur*, Vol.III/No.1/Januari-Juni 2014, hal. 251-265
- Rusman. (2012). *Model model pembelajaran mengembangkan profesional guru*. Jakarta : Raja Grafindo Persada.
- Sagala. Syaiful. (2010). *Konsep dan makna pembelajaran: Untuk membantu memecahkan problematika belajar dan mengajar*. Bandung: Alfabeta.
- Sisdiknas. 2013. *Undang-Undang Nomor 20 Tahun 2003 tentang Sistem Pendidikan Nasional*. Jakarta
- Slameto. 2010. *Belajar & faktor-faktor yang mempengaruhi*. Jakarta: Rineka Cipta
- Thompson, John F. (1973). *Foundations of vocational education: Social and philosophical concept*. New Jersey: Prentice-Hall, Inc.
- Tim Pekerti AA. 2010. *Panduan Pelaksanaan Student Centre Learning*. Universitas Sebelas Maret: Lembaga Pengembangan Pendidikan.
- Wells, G. & Claxton, G. (2002). *Learning for life in the 21 st century*. Malden, MA: Blackwell.
- Wina Sanjaya (2007). *Strategi Pembelajaran*. Jakarta: Kencana

TEACHERS QUALIFICATION FOR VOCATIONAL EDUCATION AND TRAINING PROGRAM IN HEAVY EQUIPMENT SECTORS

Moch. Bruri Triyono, Achmad Arifin, Nur Hasanah

Faculty of Engineering, Yogyakarta State University
bruritriyono@uny.ac.id

ABSTRACT

This paper aims to describe the qualification of teachers or trainers in the Vocational Education and Training Program in Heavy Equipment Sectors. Data were collected through interviews and direct observation to vocational and heavy equipment industries in the island of Java and Kalimantan. Data analysis used is descriptive qualitative approach. The result showed that: (1) in formal education (SMK), educators must have the academic qualification of at least S1 fields of automotive or machinery, capability of heavy equipment including the basic technical training / basic mechanic, engine intermediate, electrical training, hydraulic system and powertrain. Technical training in heavy equipment or work experience in the industry is a plus, (2) in non-formal education (training center industry), trainers must master the material and basic competencies for heavy equipment mechanics, which is similar to the certificate III for mechanical, electrical and fabrication technicians and also has the ability to teach and completed the training program for trainers or certificate IV for training and assessment, (3) there is a need to develop qualifications and competencies for heavy equipment educators, which involves SMK, industry, university and the government to acquire the competence of vocational graduates that are relatively the same as the graduates of mechanics training organized by industry.

Keywords: teachers qualification, education and vocational training, heavy equipment technical training, heavy equipment mechanics.

I. INTRODUCTION

Heavy equipment utilization is increasing in the mining and construction industry. This situation leads to the needs of the Human Resources (HR) with the competence of maintenance and repair of heavy equipment has increased in terms of both quantity and quality. Heavy equipment in question is a large-sized machine designed to perform functions such as earth working and moving building materials. Heavy equipment generally consists of five components, namely implements, traction, structure, power source and its transmission (power train), and the control system (<https://id.wikipedia.org>). Heavy equipment holds a significant factor in projects, especially those dealing with construction, mining and other large scale activities. Rostiyanti (2008: 1) explains that the purpose of heavy equipment utilization is to enable people to have the works done, so that the expected results can be achieved more easily with a relatively shorter time. Heavy equipment that is commonly used in

construction projects, among others: (1) dozer, (2) excavator such as backhoes, front shovels, clamshell, (3) a conveyance such as loader, truck and conveyor belt, (4) roller ground such as roller and compactor.

Efforts to support the fulfillment of human resources in question need to be done in various ways, namely non-formal education undertaken by an industry in the form of a training center or formal education such as vocational schools (SMK), Polytechnic, and University. HR needs in heavy equipment areas such as mechanics and operators continue to increase every year. It is as presented by Assistant Director of Academic UT School Bustamamsyah Djalal that HR need is in correlation with the increasing heavy equipment sales in every year. However, the number of workers in heavy equipment business is quite limited compared to the existing needs. (<http://www.medanbisnisdaily.com>)

One of the obstacles encountered in preparing the human resources, especially heavy equipment mechanics and operators is

the availability of professional educators whose qualifications and competence can be accepted by the industry as the employer and administratively recognized by the government in accordance with the applicable legislation. Jalal and Mustafa (2001) describes the results of studies that teacher is the main factor that can determine the success of the educational process in which it can be seen from the students' learning achievement. Eligible teachers provide a significant contribution in improving the quality of the educational process such as curriculum reform, development of instructional media and application of learning methods.

Regulation of the Minister of National Education No 16 in 2007 states that a teacher shall have academic qualifications and competence which includes pedagogical competence, personal competence, social competence, and professional competence acquired through professional education and integrated in teacher performance. Ananda et al (2010: 65) mention that teachers hold a strategic role in education. Their study to SMK teachers with a field of industrial technology in all areas of Malang city shows that the majority of teachers (78.77%) with certified educators have a good pedagogical competence, 78.38% have a good personal competence, 77.42% have a good social competence, and 76.95% have a good professional competence.

Arif Rahman (2009: 14) in his study explains that the problem of improving eligible teachers cannot be resolved simply by providing sufficient salary and welfare, but it is also necessary to enhance and improve the teachers' competence. This is crucial because science and technology is always changing and evolving rapidly, so it is necessary for teachers to continue to improve their professionalism hence they are updated or even create a new engineered technology for the benefit of wider communities.

This paper is going to analyze the qualification of teachers/instructors in vocational education and training programs in the field of heavy equipment both organized by SMK and industry. The results of this analysis are expected to gain a complete picture about the profile and competence of vocational educators in heavy equipment field. These results are beneficial as an input for the improvement of curriculum development in universities and training institutes to prepare educator/instructor candidates in engineering machine.

II. METHOD

Data analysis employs qualitative descriptive approach to the measures as proposed by Burhan Bungin (2003: 70), as follows: (1) data collection, which is carried out by observation or direct observation, interviews and document analysis, (2) data reduction, namely electoral process focusing on simplification and transformation of data from data collection, (3) data presentation, a description of a set of data which gives the possibility of drawing conclusions and taking action, (4) verification and conclusion assertion namely the interpretation of data to find the meaning of the presented data.

The population sample is parties involved and interested in the implementation of education programs and vocational training field of heavy equipment, namely: SMK as education institutions producing middle-level workers, a company engaged in heavy equipment field, and college that becomes a place to educate SMK teachers. The location of this sample group spread across several cities in Java and Kalimantan.

III. RESULT AND DISCUSSION

Based on the results of direct observation and interviews and after performing data reduction, the obtained data is presented in Table 1.

Table 1 Observation data after data reduction

NO	Institution	Learning Activities	Teachers' Qualification
1.	SMK N 1 Singosari Malang	Learning activities are done by using a block system. Compulsory learning resources are modules from industry and combined from common text books.	Teachers with a bachelor degree in mechanical,automotive engineering that have received training in heavy equipment in PT Trakindo Utama

NO	Institution	Learning Activities	Teachers' Qualification
2.	SMK BAKTI BANGSA Banjarbaru Kalimantan Selatan	Learning theory is done in schools, while practical lessons in schools and Banjarmasin UT Training Center. The material is developed based on the results of teacher training at TC UT Banjarmasin.	Teachers have a diploma degree from formal education and work experience in an industry or a bachelor degree; a certificate of competency of heavy equipment from an industry.
3.	SMK PGRI Banjarbaru Kalimantan Selatan	Learning theory is done in schools and sometimes by inviting guest teachers from the industry. Practice learning is held in school workshops and industrial workshops.	Teachers have Diploma from formal education and a training certificate of a company, work experience in an industry and integrity.
4.	SMK N 5 Banjarmasin Kalimantan Selatan	The learning process is done in schools (both theoretical and practical). Instructional materials refer to materials from industry which is obtained by teachers who join industry's training.	Teachers have a bachelor degree from formal education or a competency from heavy equipment training in an industry.
5.	SMK N 1 Balikpapan Kalimantan Timur	Theory and practice is done in an integrated way and later validated by teachers as a requirement to join industry work practice.	Teachers with a bachelor degree in mechanical / automotive engineering and teachers in a combined class have received training in Trakindo.
6.	Training Center PT United Tractors Cabang Banjarmasin	Training for all new mechanics is held for 1 year (4 months of theory and practice at UT School, 8 months internship in a project site). The development (advanced training) is given in each competency according to the interests and talents of each mechanic	Instructors shall master the material and basic competence of mechanics and receive training for trainers and other supporting training to improve their teaching abilities.
7.	Traning Center PT Thiess Contractors Indonesia	Apprentice program is held for 8 blocks @ 6 months. Material: Basic mechanic awareness, mandatory material from Thiess, trade stream, and specialist units.	Instructor qualification criteria are established in accordance with CQ University, Cert IV for training and assessment.

Table 1 shows that learning activities in the field of heavy equipment engineering are conducted in two lines of education namely, formal education from vocational schools (SMK) and non-formal education from training center in the industry. SMK organizes heavy equipment education programs and the industry also conducts training in the field of heavy equipment to prepare mechanics and operators personnel. Chairman of Heavy Equipment Engineering Program in SMK Negeri 1 Singosari Malang mentions the heavy equipment learning process is carried out using a block system. Compulsory learning resources shall employ modules from industry and learning resources from common text books. Students' evaluation is carried out by assessors from schools and an industry. However in some vocational respondents/other observation objects,

there is a small difference in the learning process which is carrying out theory and practice in an integrated in schools by teachers. During the education program students are required to join industry work practice for varying periods of about 2 to 6 months.

The data observation also shows that training programs in industries are more intensive and specific. Paimin (Training Center United Tractors) states that to become a new mechanic in PT UT, vocational graduates shall join an intensive training for 1 year (4 months of theory and practice in the UT School workshop, 8 months of internship in a project site). Furthermore, Alusiyansyah explains that the training program for aspiring mechanic in PT Thiess Indonesia is in the form of an Apprentice program conducted for 8 blocks @ 6 months

in workshops training center and PT Thiess project site.

One significant component which supports the heavy equipment engineering learning process is educators both teachers in vocational schools and instructors in industry training center. Qualifications of educators and instructors shall be relevant and aligned with the competencies of graduates defined. Regulation of the Minister of National Education of the Republic of Indonesia No. 16 of 2007 on standard of academic qualifications and teachers' competence explains that any teachers or educators shall have academic qualifications and competency standards that apply nationally. Teacher competency standards are developed from the four core competencies, namely pedagogy, personality, social, and professional. This paper discusses only in terms of academic qualifications, pedagogical competence and professional competence. Firstly, academic qualification is education requirement that shall be met by an educator as evidenced by diplomas and/or certificates of relevant expertise. Secondly, pedagogic competence is the ability of teachers/educators in managing the learning process, recognizing the learners' characteristics, mastering learning theory and principles of learning, and be able to develop curriculum and instructional media. Lastly, professional competence is the ability of teachers or educators in participating in the development of science in accordance with the areas of expertise that is always dynamic, developing with learning and reflective action in mastering the learning material broadly and deeply.

Paimin of Training Center United Tractors explains that an instructor shall master the material and basic competence of mechanic by joining the Training for Trainers and other supporting training to improve the teaching abilities. In addition, Darmawan, an instructor coordinator in PT Thiess training center elucidates that an instructor shall have skills in heavy equipment engineering that are relevant to a certificate III for mechanical, electrical and fabrication engineering, and qualify for a certificate IV for training and assessment issued by CQ University Australia. Both only

describe the requirements of the pedagogic and professional competence, but they do not describe the academic qualifications required to become an instructor. Other data reveals that the majority of industrial instructors have a bachelor degree but some of them also have the educational background of high school / vocational school with work experiences.

In general vocational teachers' qualification in heavy equipment engineering fulfills government requirement which is a bachelor degree in automotive engineering or mechanical engineering. It is in line with the explanation given by the Chairman of the Heavy Equipment Engineering Program SMK Negeri 1 Singosari and the explanation of the Chairman Heavy Equipment Engineering Program SMK Negeri Banjarmasin. Teachers also shall have skills in heavy equipment engineering including basic technical training/basic mechanic, engine intermediate, hydraulic system and powertrain, electrical training, and experience of industrial training or work experience. Teachers who teach industrial cooperation classes are required to have a certificate of training in heavy equipment engineering from industry partner as explained by the Head of SMK Negeri 1 Balikpapan.

Table 2 presents a comparison of the qualifications and competency of vocational teachers and training instructors in an industry seen from the academic qualification factors, pedagogical competence and professional competence. Table 2 defines that heavy equipment engineering educator qualifications of vocational teachers and instructors have in common, but there are differences in quality standards in terms of academic, pedagogy and professional. Pedagogical competence of vocational teachers is not identified definitively from the observation, but it can be assumed that the pedagogical competence is attached to their bachelor degree. This is because the provision of qualifications and competence of vocational teachers shall be based entirely on the rules and regulations set by the government, while the instructor qualification prefers achievement of graduates' competencies.

Table 2. Comparison of the qualifications and competence of vocational teachers and instructors of heavy equipment training

No	Qualifications/ Competencies	Vocational Teachers	Instructors in Industry
1.	Academic	A bachelor degree in Automotive Engineering or Mechanical Engineering	There is no absolute requirement. (A bachelor degree or graduated from vocational school with considerable field experience)
2.	Pedagogy	Unidentified	<ul style="list-style-type: none"> • Training for Trainers • Certificate IV (training & assessment)
3.	Professional	<ul style="list-style-type: none"> • basic technical training /basic mechanic • intermediate engine system, • intermediate hydraulic system, • intermediate powertrain, • electrical & electronic system, engine rebuild. 	<ul style="list-style-type: none"> • Safety • Product Knowledge • Tools • Basic Machine Element • Basic Driving • Diesel Engine • Hydraulic System • Electrical System • Direct Drive System • Torqflow Drive System • Steering & Brake System • Final Drive & Undercarriage • Axle, Wheel & Suspension • Basic Remove & Install • Basic Maintenance • Basic Trouble Shooting • Part Book Reading

The relationship between the two, where there are similarities and differences, in order to facilitate further understanding can be described as in Figure 1 below.



Figure 1. Chart of qualifications and competence of vocational teachers and instructors.

Optimal alignment between the educator qualification for vocational teachers and instructors can be achieved by enlarging or expanding sections intersecting in Figure 1 above. Vocational school party

and industry facilitated by the government and supported by the college on the basis of mutually beneficial cooperation can make a mutual agreement related to the competency expanding. If the section is increasingly broad, the qualification and competence of vocational teachers and instructor are relatively equal so that the graduates from both vocational and industrial training center have the equal competency standards.

Thus vocational graduates who will work in the industry only require a shorter training to become a heavy equipment mechanic as required by the industry. The industry will be more efficient in setting up new mechanics recruitment from vocational fresh graduates. Universities and colleges are expected to actively participate in positive contribution to generate prospective professional vocational teachers in heavy equipment field. They shall be proactive to improve and restructure the curriculum to be able to produce more candidates who are ready to become a vocational teacher or an instructor in the industry's training center.

This line of thought to programs of qualification and competence development of heavy equipment engineering educators as the description above is shown in Figure 2 below.

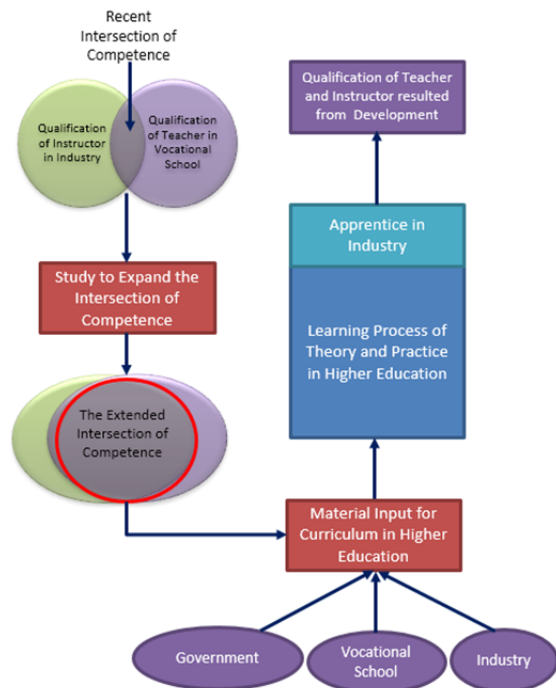


Figure 2. The pattern of development of qualifications and competence of heavy equipment engineering educators

Figure 2 illustrates that to gain the educator qualification of heavy equipment engineering as vocational teachers and instructors in the industry requires a proactive and contributive cooperation of each stakeholder. Particularly universities shall open opportunities in accepting input related to the improvement of the curriculum and the learning process in order to adjust vocational and industrial needs. Curriculum improvements include the adjustment of professional scientific competence that is relevant to heavy equipment technology developments. Universities shall provide sufficient time for internships or industry practice for students of heavy equipment engineering education program.

Vocational teachers qualification in heavy equipment is developed based on the pattern as Figure 2 above and is expected to obtain outcomes as follows: (a) having a bachelor degree in heavy equipment

engineering, mechanical engineering or automotive engineering, (b) having internship experience or industry practices or field experience in heavy equipment, (c) having more pedagogical expertise with a certificate of training and assessment, (d) mastering the ability and professional competence of heavy equipment, as listed in Table 11 above.

IV. CONCLUSION

Based on the result and discussion regarding the educator qualification in heavy equipment engineering can be summarized as follows: (1) in formal education (SMK), educators shall have the academic qualification of at least S1 fields of automotive or machinery, capability of heavy equipment Including the basic technical training/basic mechanic, engine intermediate, electrical training, hydraulic system and powertrain. Technical training in heavy equipment or work experience in the industry is a plus, (2) in non-formal education (training center industry), trainers must master the material and basic competencies for heavy equipment mechanics, which is similar to the certificate III for mechanical, electrical and fabrication technicians and also has the ability to teach and completed the training program for trainers or certificate IV for training and assessment, (3) it is necessary to develop educators' qualifications and competencies by involving parties from SMK, industry, universities and the government to acquire vocational graduates' competence that is equal to industry training graduates.

REFERENCES

- B. Bungin. (2003). *Analisa Data Penelitian Kualitatif: Pemahaman Filosofis dan Metodologis ke Arah Penguasaan Model Aplikasi*. Jakarta: Raja Grafindo Persada.
- F. Arif, A. Ananda, A. Mukhadis. (2010) *Kinerja Guru Kejuruan Bersertifikat Pendidik Ditinjau dari Standar Kompetensi Guru Profesional Sesuai Undang – Undang Nomor 14 Tahun 2005*. Jurnal Teknologi dan Kejuruan, Vol. 33, No. 1, pp. 65-80.

- J. Fasli. and M. Bahrudin (2001). *Education Reform, in the Context of Regional Autonomy: The Case of Indonesia*. Jakarta: Ministry of National Education.
- Republic of Indonesia. (2007). *Peraturan Menteri Pendidikan Nasional No 16 tahun 2007*. Jakarta.
- S. Rostiyanti. (2008). *Alat Berat untuk Proyek Konstruksi*. Jakarta: Rineka Cipta.
- Thompson, John F. (1973). *Foundations of vocational education: Social and philosophical concept*. New Jersey: Prentice-Hall, Inc.
- Wikipedia. *Alat Berat*. https://id.wikipedia.org/wiki/Alat_berat was accessed on 1 August 2016
- (<http://www.medanbisnisdaily.com>). was accessed on 1 August 2016

INFORMATION SYSTEM MODEL OF SELF-EVALUATION EFFORTS TOWARDS WORLD CLASS TEACHERS' INSTITUTION OF VOCATIONAL EDUCATION AND TRAINING

Edy Supriyadi

Lecturer of Faculty of Engineering
State University of Yogyakarta
edy_supriyadi@uny.ac.id

ABSTRACT

In the era of Asean Economic Community, Teachers' Institution of Vocational Education and Training (LPTK's) are supposed to produce highly competent and competitive graduations. Otherwise, the teachers from Asean countries will overrun SMK's in Indonesia. There is no Indonesian LPTK's in the category of world-class universities. LPTK's have no idea what are the real problems. The data as results of self-evaluation so far offenly are inaccurate, less comprehensive, obsolote, and not well managed yet. As a result, the development and implementation of programs often misses and not bring improved quality and performance of LPTK's. Computer-based self-evaluation (web based information system) is one attempt to overcome these problems. It is a collection of hardware and software devices as well as human that will asisst in program development, implementation of self-evaluation, data processing, results management and utilization, and other related purposes. Self-evaluation supported by information system is expected to improve the quality of LPTK's toward world-class university, not just for national accreditation purposes. LPTK's are needs to develop a comprehensive and integrated information system that aligned with the level of information systems at Universities, Faculties, and Departments. The steps to develop and use web-based information systems of self-evaluation toward world class LPTK's are: (1) prepare teams of the information system, (2) develop information systems and devices, both hardware and software, (3) develop implementation programs of self evaluation, (4) conduct computer-based self evaluation, (5) manage the self evaluation results, (6) utilize the results of self-evaluation for program development (national, regional, and international), and (7) implement program development.

Keywords: information system mode, self-evaluation, LPTK's, vocational education

I. INTRODUCTION

Implementation of the free access policy of goods and labor in the countries of South East Asia (ASEAN Economic Community/AEC) has implications for many areas of life. ASEAN Economic Community encourage the flow of investment into the country, increase the speed of movement of people and capital. Enforcement of AEC increase the bargaining power possessed by the people in determining their choice of the many products and services offered, and to improve technology transfer from developed countries to developing countries (Ministry of Trade, 2014).

It has also implications for vocational education. Vocational schools in Indonesia need teachers who have competence in the global level. LPTK's should graduate candidates for vocational high school (SMK) teachers who are competent and

competitive. Otherwise, teachers from Asean countries will overrun the SMK in Indonesia.

Higher education quality in Indonesia, especially LPTK's still needs improvement. Based on data from the National Accreditation Board of Higher Education by January 2016, only 26 (0.66 %) universities in Indonesia accredited institution A (Ariawan, 2016). Most universities are state universities, especially those that have the status of legal entity (Badan Hukum). In term of the world university rankings based on the methodology for the Academic Ranking of World Universities, or ARWU, since 2009 there is no LPTK's in ARWU rankings. There are only a few universities (non-LPTK's) which entered the ranking as a world-class university, including the University of Indonesia, Bandung Institute of Technology, and the University of Gajah Mada.

In order for LPTK's to play a significant role, the development LPTK's toward world-class universities is very important. According to Jamil Salmi (2009), there are some main aspects related to world-class universities, among others: high-quality human resources, excels in research, quality learning; adequate financing sources; International students who are gifted; academic freedom; lecture supporting facilities; research, management; and student life.

Pertaining to quality, one of the main problems frequently encountered LPTK's is not yet known exactly what kind of quality standards should be established, what components are still lacking, and how to overcome them. Every year LPTK's generally conduct a self-evaluation of the potential and its performance, as well as the opportunities that would be achieved. Self-evaluation that has been done so far tend to be less dynamic and sustainable that development data about the internal state of the institution and external conditions can not be viewed accurately and in real time. As a result, development and implementation of programs LPTK's often missed and yet brings improved quality and performance of institutions significantly. Continuous self-evaluation based computer is one way to overcome these problems.

II. METHOD

This study was conducted by reviewing the literature, either in the form of reference books, research journals, examples of information systems in college, and FGD with colleagues in the Faculty of Engineering University of Yogyakarta. The study provides some ideas of the general information system for self-evaluation in LPTK's.

III. RESULT AND DISCUSSION

3.1. Self Evaluation

Strategic Plan of Directorate General of Science & Technology and Higher Education, year period 2015-2019, among others realize five Indonesian universities included in the top 500 in the world according to the QS World standards, and increase the number of higher education that accredited A, and provide incentives to college to become a

world class university. Law No. 12 of 2012 on Higher Education confirmed the integration of Quality Assurance of Higher Education are in a system, the Quality Assurance System of Higher Education (SPM PT), which consists of Internal Quality Assurance System, External System Quality Assurance or accreditation, and a Database Higher Education. Quality Assurance System of Higher Education is a systemic activity to improve the quality of higher education in a planned and sustainable.

One of the components that are essential to the quality assurance system is self-evaluation. According to Chapman and Sammons (2013), self-evaluation is a process to help improve the school or college that is carried out by the institution itself, and integrated with regular management system. Self-evaluation is a process relating to internal assessment institutions (schools, universities, companies), collaborative, inclusive and reflective. Some fundamental questions relating to self-evaluation, among others: How does the current condition of the institution? How do we know this? What evidence do we have? What are our strengths? What aspects need to be improved? How can we fix it?

Self-evaluation is an attempt courses/ colleges to find a picture of the performance and the state itself through assessment and analysis conducted by the study program/ university itself regarding the strengths, weaknesses, opportunities, challenges, obstacles, even threats. Assessment and analysis can be implemented by utilizing peer expert from outside courses/colleges, so that self-evaluation can be carried out objectively (BAN PT, 2010).

Benefits of self-evaluation, among others, to draw up a comprehensive institutional profile with the latest data, plan and improve on an ongoing basis, and prepare to accreditation. Continuous self-evaluation based computer is a process of collecting and processing data about the state/condition and performance of institutions that are designed and carried out in a systematic, computer-based, sustainable, so that the evaluation results are dynamic and accurate .

According to the Regulation of the Minister of Education and Culture of the Republic of Indonesia Number 49 Year 2014, the National Standards of Higher Education is the standard unit includes the National Education Standards, coupled with the National Standards Research, and the National Standards Community Service. National Education Standards consist of: competency standards; learning content standards; standard learning process; learning assessment standards; standard lecturers and education staff; standards of learning facilities and infrastructure; learning management standards; and financing standards of learning.

Systemically, Universities consists of several key components that interact with each other. The main components are the components that exist on the National Standards for Higher Education. These components can be grouped into input, process, output, outcome, and impact. Self evaluation conducted by reviewing the whole system of courses/colleges, including inputs, processes, outputs, outcomes, and impacts (input, process, output, outcome, and impact). Feedback includes: vision and mission of study program; goals and objectives; college student; human resources; curriculum; facilities and infrastructure; financing. Process, includes: governance; program management; leadership; learning process; academic atmosphere; research and service/community service. Output/results includes: graduates. Others output: research publications and research products in the form of patents, designs, prototypes, software, and so on. Impacts includes: information systems; system improvement and quality assurance.

3.2. Information Systems

Information system according to Andreu, Ricart and Valor (Alcamí & Carañana, 2012) is a series of formal processes based data set according to the needs of the organization/company for the implementation of the management and control of the company. The information system is strongly associated with the use of computer technology. Information systems

related to the utilization of hardware and software designed to transform data into forms useful information for users. Computer based information system has been developed to meet the information needs of a particular person or group of persons (for example, bank managers or customers of the bank) in order to achieve a predetermined goal. The information system is used to support the overall strategy of an organization, help to do what they want or choose what to do (Cornford, M. Shaikh, 2013). The information system is not just a computer and software, but also people who operate them. The information system is a social system supported by technology.

Management information system (MIS) is structured information and documentation systematically to collect, store, process, analyze, report and disseminate information and data (UNESCO, 2009). There are four stages of work on the MIS, namely data collection, storage and processing of data, either in paper or through computer records, data analysis, and utilization to enhance analytical results for the organization. The management information system is a computer-based system that provides information to users as needed to support the achievement of the objectives of an institution. These systems can help organizations, such as universities in integrating the data, systematizing data processing, and improving the quality of information and the achievement of objectives.

One of the existing information systems in college is academic information systems. The development of MIS can be a tool in managing and searching academic information effectively and efficiently. Academic information system covers all processes ranging selection of prospective students to graduate tracking. The output of the information system is expected to provide relevant information to all relevant parties such as prospective students, faculty, administration, user's graduates, and other related parties.

According to García Bravo (Alcamí & Carañana, 2012) information system consists of hardware, software, telecommunications, databases, human resources, and

procedures. Currently, all companies use computers, usually a personal computer (PC). Large organizations use diverse computer systems and more complex. There are two types of computer programs: system software and application software. System software is used for managing computer system resources and simplifying programming. Application software, such as spreadsheets, word processing, is directly applied by users.

A database is a collection of related data, such as human resources organization or database products. Telecommunications is a means by which information is transmitted electronically. At present, the computer system is generally associated with telecommunications network. A variety of network connections are available to meet the needs of different companies. Human resources can be divided into two, namely: information systems specialists and end users. Specialist information systems include systems analysts, programmers and operators. End users are those who use information systems or the resulting output.

The procedure is the policy and method to be followed when using, operating and maintaining information systems. The procedure should be used, for example, when running a program to build your company's payroll, to determine how many times it should be run, which is authorized to do so and who has access to the reports.

3.3. Model Information System Self-Evaluation

The development of an information system in general include: analysis of system requirements, design or system design that includes database design and the design view, development of a system that includes code generation program and display development, testing the performance of the functional system, implementation, evaluation, and completion. Discussion of self-evaluation information system model here does not cover all the stages, but more towards the needs of the system.

Self-evaluation is primarily performed in order to obtain accurate information about the condition of each component of the implementation of activities in accordance

with the purpose college. Self-evaluation is not just for the sake of accreditation (external), but rather to self-improvement in order to achieve college objectives optimally. The focus of self-evaluation that is just for the sake of accreditation by BAN-PT makes the PT only focused at the local level, and the national level. As efforts to a regional level (ASEAN), and even international level, then the scope of self-evaluation should be more thorough, and with high quality standards as demanded by regional and or international level. Gradually, it is necessary to design a self-evaluation that lead to the regional and international levels. Some non-LPTK's colleges are now doing some sort of international accreditation for some of the study programs.

In accordance with the Regulation of the Minister of Education and Culture of the Republic of Indonesia Number 87 Year 2014 About the Accreditation Program and College, in Article 3 (1) states that the accreditation is done to the Study Program, and Universities based on the interaction in the National Standards for Higher Education. National Standards for Higher Education includes competency standards; learning content standards; learning process standards; learning assessment standards; lecturers and education staff standard; standards of learning facilities and infrastructure; learning management standards; and financing standards, the national research standards, and the national standard of community service.

There are seven components subjected to national accreditation (BAN PT), namely: Component A, include: vision, mission, goals and objectives, and strategy achievement; Component B includes: governance, leadership, management system and quality assurance; Component C, include: students and graduates; Component D, include: human resources; Component E, include: curriculum, learning and academic atmosphere; Component F include: funding, facilities, and infrastructure, and information systems; and Component G, covering: research services/ community service, and cooperation.

Leadership is an essential component in improving the quality of higher education.

Therefore, the self-evaluation should also touch the subject of leadership, on the level of Program Studies, Department, Faculties, and Centre (University). During this time the leadership is likely to judge his subordinate. Whereas the assessment by subordinates to the leaders, it is very important to improve the quality of leadership.

However, to the quality standards of each component is still behind compared to developed countries. As an illustration, accreditation in India at least includes seven major components, namely Curricular Aspect; Teaching-Learning and Evaluation; Research Consultancy and Extension; Infrastructure and Learning Resources; Student Support and Progression; Organization and Management; Healthy and Innovative Practices (Hernes and Martin, 2008).

One of the self-evaluation framework coverage in the UK include: Characteristics of the school; Views of Learners; Parents and Other Stakeholders; Achievement; Personal Development and Well-being; The Quality of Provision; Leadership and Management; Overall Effectiveness and Efficiency (Chapman and Sammons, 2013). Figure 1 is a picture of model of self-evaluation component to the national level, and its development towards regional and international level.

In general, when seen from its level, management can be classified as college-level management (Centre/University), Faculty-level management, Department and or Study Program-level management. The name and management levels can vary according to the type of college (School, University, etc). MIS in Higher Education can be entirely or almost entirely in Centre (University), and or there is at every level of the Faculty, Department and Study Programs. It depends on the complexity of the University, both the number of Faculty/Department/Study Programs, and substance administered.

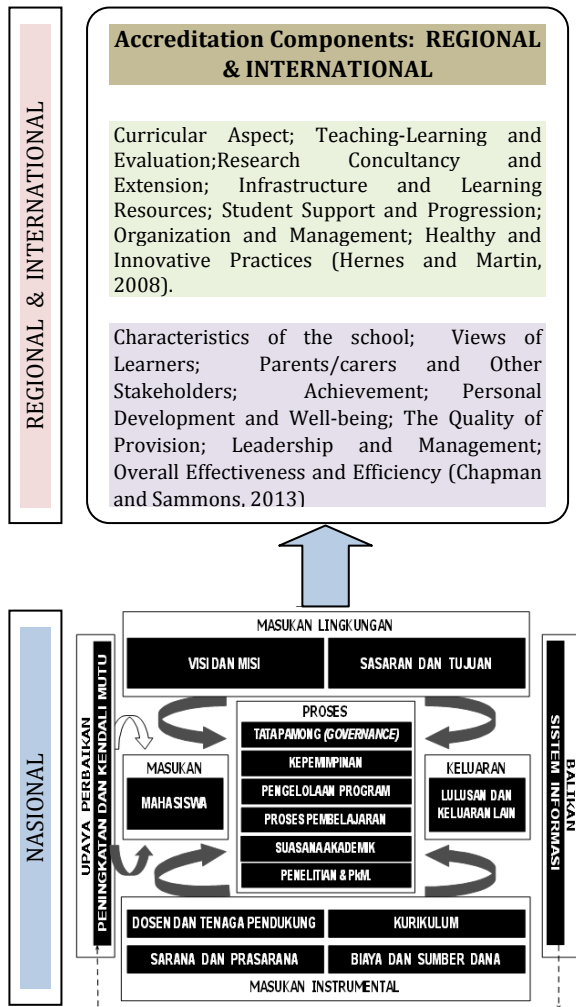


Figure 1. Systemic Components of Self-Evaluation: National-International (Dikti, 2010 Modified)

Keep in mind that self-evaluation should not only for the benefit of a national accreditation. Self-evaluation should also be directed to improvement of higher education at the regional and international levels. In general components of accreditation/evaluation at national level (Indonesia), Asian countries as well as developed countries (United States) are quite similar, although there are slight differences.

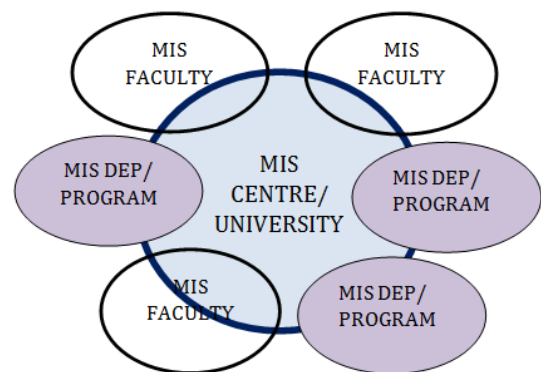


Figure 2. The Scope of MIS Model at Higher Education

Figure 2 is an example of the scope of MIS Self-Evaluation model that is partially shared. In this model, MIS-level University covers all matters pertaining to the central level, covers some faculty affairs, and affairs Department/Study Program. MIS-level Faculty covers all affairs at the faculty level, partly sharing/connected with the affairs of the University and the Department /Study

Program. MIS-level Department/ Study Program covers all affairs departments/ study programs, and sharing/ connected with the affairs of the University and Faculty. The advantages of this system are data can be updated and shared through 'the system partition' so that it does not require too much memory, and simple.

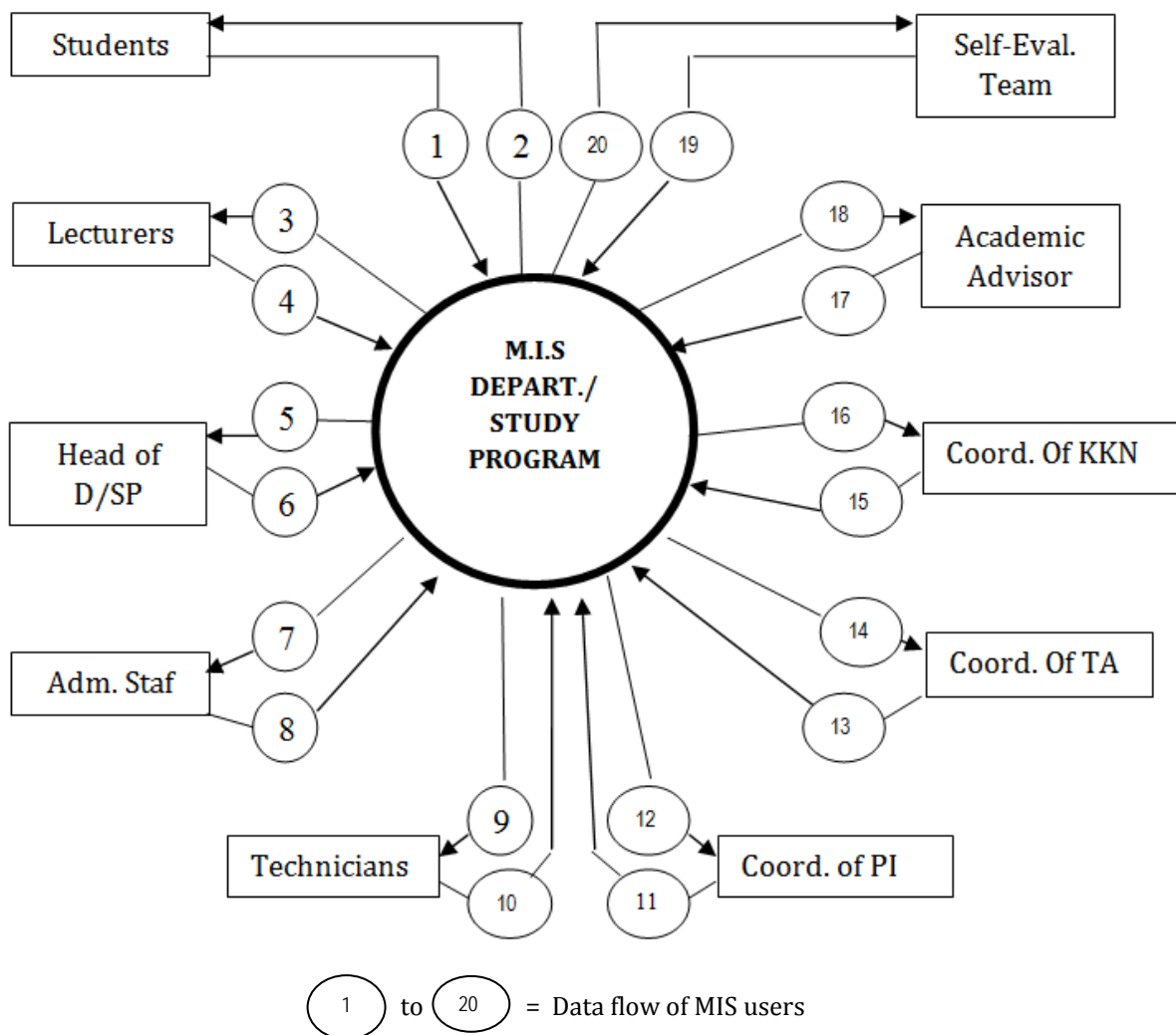


Figure 3. Model of MIS-Self Evaluation Context at Department Level Jurusan di LPTK

As an illustration to design a web-based information systems of self-evaluation at study program/department, Figure 3 shows at least 10 terminator or users of information systems, i.e Students, Lecturer, Head of Departmen/Study Program, Administration, Technician, Coordinator of Industrial Practice, Project Coordinator, Academic Advisor, and Self-Evaluation team.

The number of users can be developed in accordance with the conditions of each college.

The steps that need to be done by LPTK's in developing and utilizing web based information systems for development LPTK at the national, regional, and international are: (1) setting up a team of information systems, (2) develop information systems,

both hardware and software, (3) develop a program of implementation of self-evaluation, (4) conduct a self-evaluation based computer, (5) performing data processing, (6) manage the results of self-evaluation, (7) utilizing the results of self-evaluation for program development (national, regional, and international), and (8) implement the development program.

IV. CONCLUSION

Based on the results and discussion can be concluded that: (1) Self-evaluation can be designed and well implemented if supported by web-based information systems that are connected systematically, comprehensive, and easy to use by the user, (2) Self-evaluation should not only be in the interests of national accreditation, but also to improve the overall quality of higher education, and lead to the accreditation of regional and international (a world-class university), (3) LPTK's need to develop a web-based information system that is integrated, and aligned with the level of information systems at the University, Faculty and Department/Study Program.

REFERENCES

- Ariawan Andi Suhandana. (2016). *Mendongkrak Mutu Perguruan Tinggi Indonesia*. Direktorat Jenderal Kelembagaan IPTEK dan DIKTI. <http://kelembagaan.ristekdikti.go.id/index.php/2016/05/09/mendongkrak-mutu-perguruan-tinggi-indonesia/> Diunduh 10 Agustus 2016.
- BAN PT. (2010). *Pedoman Evaluasi-Diri Untuk Akreditasi Program Studi Dan Institusi Perguruan Tinggi*
- Chapman, Christopher and Sammons, Pamela. (2013). *School self-evaluation for school improvement: what works and why?* Copyright CfBT Education Trust: Manchester, UK.
- Cornford, M. Shaikh. (2013). *Introduction to information systems*. University of London: London, UK.
- Hernes, Gudmun and Martin, Michaela. (2008). *Accreditation and The Global Higher Education Market*. International Institute for Education Planning: Paris.
- Jamil, Salmi. (2009). *The Challenge of Establishing World-Class Universities*. The World Bank, Washington DC, USA
- Kementerian Pendidikan dan Kebudayaan Direktorat Jenderal Pendidikan Tinggi Direktorat Pembelajaran dan Kemahasiswaan. (2014). *Pedoman Sistem Penjaminan Mutu Pendidikan Tinggi*.
- Kementerian Pendidikan Nasional Direktorat Jenderal Pendidikan Tinggi (2010). *Sistem Penjaminan Mutu Perguruan Tinggi*.
- Kementerian Perdagangan. (2014). *Menuju Asean Economic Community 2015*. Seminar Nasional. Malang 10 Juni 2014.
- Peraturan Menteri Pendidikan Dan Kebudayaan Republik Indonesia Nomor 87 Tahun 2014 Tentang Akreditasi Program Studi Dan Perguruan Tinggi.
- Peraturan Menteri Pendidikan Dan Kebudayaan Nomor 49 Tahun 2014 Tentang Standar Nasional Pendidikan Tinggi.
- Peraturan Menteri Pendidikan Dan Kebudayaan Republik Indonesia Nomor 50 Tahun 2014 Tentang Sistem Penjaminan Mutu Pendidikan Tinggi.
- Ruairi Quinn, TD. *School Self-Evaluation. Guidelines for Primary School*
- Undang-Undang Nomor 12 Tahun 2012 Tentang Pendidikan Tinggi
- UNESCO. (2009). *Developing Management Information Systems for Community Learning Centres; A Guide Book*. Bangkok

EMPOWERING INDONESIA'S TVET TEACHER EDUCATION IN ASEAN ECONOMIC COMMUNITY ERA

Lutfiyah Hidayati

Doctoral Student of Post Graduate School, Yogyakarta State University
email: lutfiyahhidayati@unesa.ac.id

ABSTRACT

The TVET Institutions for Teaching Personnel (LPTKs) as producers of teacher for secondary vocational and technical schools, face many challenges in AEC era. To be acceptable in ASEAN, LPTK must meet the system standards in the region. Standard agreement regarding teacher education system is one of the external efforts. Internal efforts are no less important to do. Revamping the LPTK's system, ranging from the need assessment, recruitment of prospective students, process of learning, facilities and infrastructure, graduates/output. Strengthening TVET teacher education through industrial collaboration and partnership with Vocational Schools. This will ensure that TVET curricula and teaching methodologies are relevant and up-to-date. The close collaborations would significantly improve the quality and relevance of TVET and the output.

Keywords: TVET, teacher education, AEC

I. INTRODUCTION

During the 12th ASEAN Summit in January 2007, the ASEAN leaders affirmed their strong commitment to accelerate the establishment of an ASEAN Economic Community (AEC) by 2015. Under the AEC, ASEAN countries will integrate as a single market and production base (M. Aring, 2015). Since the time of its establishment in 1967, ASEAN has been supportive of regional cooperation in the field of educational, develop human resources through closer cooperation in education and lifelong learning, and in science and technology, for the empowerment of the peoples of ASEAN and for the strengthening of the ASEAN Community (ASEAN State of educational report, 2013). To achieve a successful education, the central goal is teachers and teacher education institutions (Zamroni, 2000).

According to Godlad, the teacher is the single most important variable in school effectiveness (Andersen, Barrick, & Hughes, 1992: 1). Future teacher, described as pure water, which clarifies (Kemdikbud, 2013). Teacher education plays a crucial role in the preparation of teachers, not only enhancing their understanding and skill but also increasing the likelihood of their staying in the profession (Darling-Hammond, 2000; Roth, 1999). Learning to teach should be

recognized as a process of continuous reconstruction of experience (Beck & Kosnik, 2006: 16). Teacher education institutions has been heavily criticized as an institution that is not effective in preparing teachers, unresponsive to the demands of time, away from the practice, and the difficulty in recruiting students brained brilliant (Roth, 1999)

Indonesia as part of ASEAN countries, face many challenges in entering the AEC, one of them is the quality of education remains low for labor, where until February 2014; there were 76.4 million people/ about 64 percent of the total 118 million workers in Indonesia, with junior high school or lower education. Based on world competitiveness ranking 2014 Indonesia become in the level 34th, lower than Singapore (2nd), Malaysia (20th), and Thailand (31st) (H. Kurniawan, 2015). An effort that is very important, to be done is, revamping teacher education institutions, making it more efficient and effective, empowering it through optimize its components.

II. DISCUSSION

2.1. TVET Teacher Empowerment Education.

All of the highest achieving nations have overhauled teacher education to ensure

stronger programs across the enterprise, and to ensure that able candidates can afford to become well-prepared as they enter the profession (L. Darling-Hammond, RC Wei, A. Andre, 2010). A good vocational education and training (VET) teacher should have: (1) cross-linked pedagogical context knowledge; (2) prior theoretical knowledge, which he/she uses to analyze pedagogical situations and to implement appropriate strategies, (3) methods to apply theoretical knowledge and (4) pedagogical competence (Barabasch & Watt-Malcolm, 2013: 165).

Immediately required the development of new paradigm of *LPTKs* in Indonesia, included TVET Teacher education, namely 5 pillars: (a) the continuously quality, (b) autonomy, (c) accountability, (d) accreditation and (e) evaluation (Depdiknas, 2002). The quality as the first *pillar* should always refer to the on going quality, which is based on the creativity and productivity. Quality is not only input but also the process of output. So, the output can compete in the labor market with graduates from other universities. Autonomy is as a form of

delegation of authority such as the recruitment and management of learners and non-academic staff, curriculum development, and teaching materials, as well as the determination of academic standards. Accountability that is not only the government's responsibility, but the university should be accountable to its constituents or stakeholders. Accreditation is an acknowledgment of the rank of a college compared to other universities in terms of output quality and performance. In the future *LPTKs* must have an accredited status for producing quality graduates. Evaluation is a major managerial actions underlying the decision. Without the continuous evaluation it will not obtain information that is useful to ensure the starting point and final point intended for the improvement.

Regarding the process, Darling-Hammond (2006) suggested 3 knowledge that must be mastered, that is about the learners, subject matter and teaching as the main stock visions of professional practice, as follow:

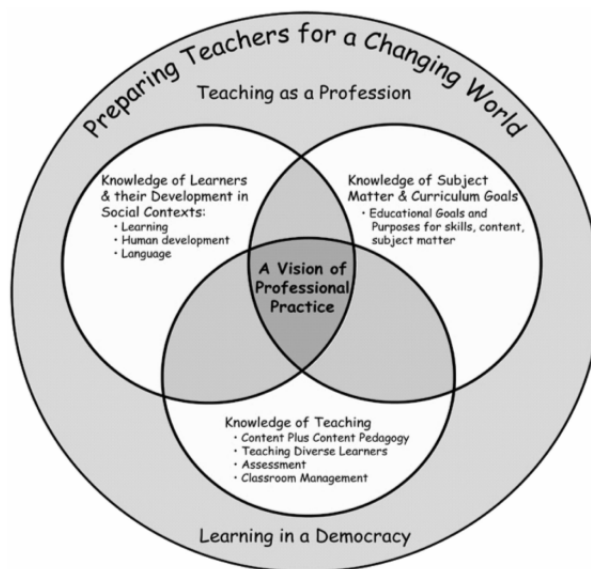


Fig. 1. A Framework for Preparing teachers (source: L. Darling-Hammond, 2006)

New technologies can empower well-prepared teachers to synthesize a multitude of internet tools for teaching. Teacher education programs, both traditional and alternative, must fully employ those same

tools as they work with New Millennium teaching candidates (B. Berry, 2010: 3).

Partnership between TVET Teacher education with schools and industries became an integral part of the system implementation. The main purpose of having

such partnerships is to ensure that student teachers see many examples of good practice during their field experiences and receive the support they need to teach in an experimental, innovative manner. This model is social constructivist in several ways. It stresses a critical inquiry approach to schooling; links theory and practice; and emphasizes caring for “the whole student teacher” in the practicum, often the most stressful aspect of the program.(Beck & Kosnik, 2006).

Vocational Education and Training (VET) in secondary schools creates a number of problems for teacher education courses. Graduates who are required to teach Dual Recognition or other industry-focused courses generally need recent industrial experience. To meet this requirement, strategies such as the recruitment of people with industry experience into teacher

education courses and some sort of structured practicum experience in industry as part of a broadly based teacher education course should be used” (Byram & Wenrich, 1956)

Character education for prospective teachers is very important in TVET teacher education system in Indonesia. The concept of future education needs to synchronize the development of science and the preservation of noble values and national character (Kemdikbud, 2013). The soul and the personality of the teacher who must therefore be established and built up in the system among namely: *asah, asih, asuh* foster a legacy Ki Hajar Dewantara that convergence towards the development of a national character (Kemdiknas, 2011, 2013). The collaboration of all them finally forming a series of system, as showed below:

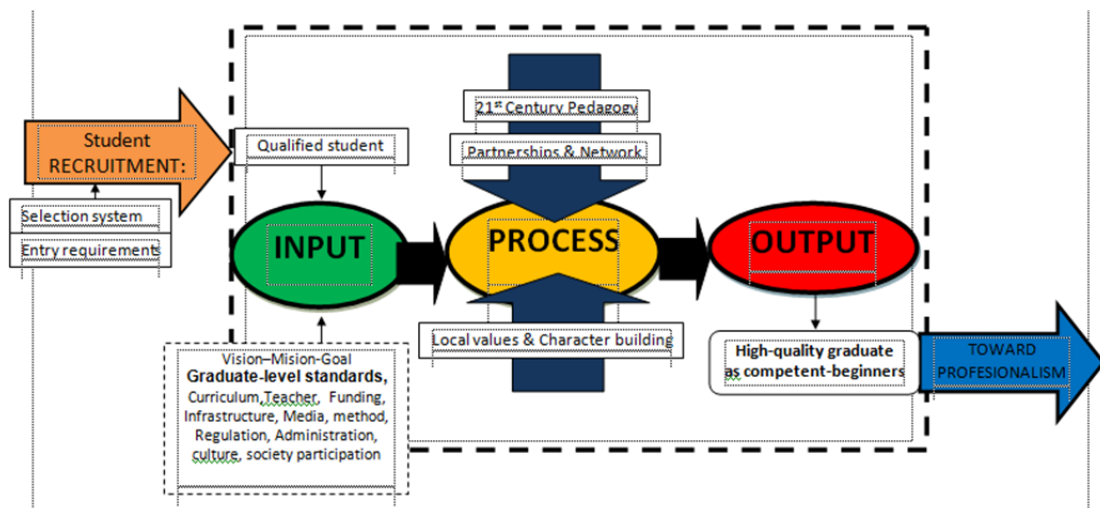


Fig. 2. Model of TVET Teacher Education in Indonesia (Source: L. Hidayati, 2014)

2.2. External efforts to empowering TVET Teacher education in AEC Era.

Internationally benchmarked quality assurance mechanisms for TVET and universities are critical for aligning not only TVET but also human capital development systems (Aring and Goldmark, 2013). Each country will need to align its educational and training institutions with qualification standards across the entire ASEAN region, from primary through tertiary education. Government alone cannot do this (M. Aring, 2015)

There are some important external efforts to facing the AEC era, in the first is to develop a framework of ASEAN teacher qualifications. Meaning that the quality of teachers in Indonesia is not much different from other countries, so that the teachers' qualifications frameworks in the region will be relatively the same. Secondly we are also developing similar standards, either standard qualification and competence standards of teachers. So that the standard of teachers in Indonesia are not much different from other countries. Third is about teacher

accreditation. Accreditation in nowadays is too broad, and should be developed a model specifically for the accreditation of teacher education so that the education of teachers with other teachers could be one measure. Indonesia in the field of education have a different problem with other countries in ASEAN, but we also do not want our teachers are too far left behind other countries. Therefore, we must developed a special accreditation on teacher education,

Recommendation For Indonesia (M. Aring, 2015) are as follow: (1) Streamline and rationalize the Government's role in TVET; (2) Ensure that the national qualifications framework has industry links and that qualifications are developed with input from industry and appropriate professional bodies; (3) Finalize the features of the nine-level qualifications framework and align them with the national economic and social development goals; (4) Develop competency-based training and assessments throughout the TVET system; (5) Develop national assessment policies regarding the qualifications framework; (6) Accelerate and expand the production of TVET graduates; currently, only 10,000 certificates are issued annually when millions are needed, and (7) Secure the support of external development partners to assist in building capacity, developing policies and implementing the national qualifications framework

III. CONCLUSION

Currently we are already in the situation of the ASEAN Economic Community (AEC). The AEC established the goal to improve the stability of the economy in the ASEAN region. AEC would have caused impacts to various fields, as well as in the field of education. In education sector, especially the TVET teacher education should be able to build an education system that is standardized. This is necessary because in the future there would be a program for teachers like teacher-exchange in the region, so that teachers can work or study freely in any country as well as students can freely learn in any country in the region.

Some internal and external efforts should be done to increase the

empowerment of TVET teacher education institutions in Indonesia, while considering SWOT owned, and the uniqueness that is not possessed by other countries as a major power for Indonesia.

IV. REFERENCES

- TJ. Anderson, RK. Barrick, R.K, & M. Hughes, (1992). Responsibilities of Teacher Education for Vocational Teacher Professional Development Programs. *Journal of Agricultural Education*. Summer. P. 43-50.
- M. Aring. (2015). *ASEAN Economic Community 2015 : Enhancing competitiveness and employability through skill development*. Bangkok : ILO.
- M. Aring & Goldmark, L. 2013. *Skills for Jobs for Growth – An integrated approach to creating human capital*. USAID Field Support Thought Leader Series. Available at: www.fhi360.org/.../FIELD%20Report%20No%2017_Skills.
- ASEAN State of educational report 2013. (2014). Jakarta: ASEAN Secretariat.
- Barabasch & B. Watt-Malcolm. (2013). Teacher preparation for vocational education and training in Germany: a potential model for Canada. *Compare: A Journal of Comparative and International Education*, Volume 43, Issue 2.
- Beck, C & Kosnik, C. (2006). *Innovations in teacher education*. Albany: State University of New York Press.
- B. Berry. (2010). *Teacher Education for Tomorrow (Final draft)*. Prepared for the National Council for the Accreditation of Teacher Education.
- H.M. Byram & R.C. Wenrich. (1956). *Vocational Education and Practical Arts in the Community School*. California: Macmillan.
- L. Darling-Hammond (Ed.) (2000). *Studies of excellence in teacher education: Preparation at the graduate level*. Washington, DC: AACTE.
- L. Darling-Hammond. (2006). *Constructing 21st-century teacher education*.

- Journal of teacher education*, Vol. 57, No. X, Month 2006 1-15.
- L. Darling-Hammond, RC Wei, A. Andre, (2010). *How High-Achieving Countries Develop Great Teachers- Research Brief*. Scoupe: Stanford Center for Opportunity Policy in Education.
- Depdiknas. (2002). *Pengembangan Sistem Pendidikan Tenaga Kependidikan Abad ke-21 (SPTK-21)*. Jakarta: Depdiknas
- L. Hidayati. (2014). *Menggagas Pendidikan Calon Guru Kejuruan Tata Busana Masa Depan*. Proceeding of National Seminar Aptekindo. Bandung: UPI-Bandung
- H. Kurniawan. (2015). *AEC 2015: Benefits and Challenges for Indonesia*. available in <https://tax.thomsonreuters.com>
- Kemdiknas. (2011). *Pendidikan Karakter di Perguruan Tinggi*. Jakarta: Ditjen Dikti
- Kemdikbud. (2013). *Menyiapkan Guru Masa Depan*. Jakarta: Kemdikbud.
- Roth, R A. Ed. (1999). *The role of the university in the preparation of teachers*. Philadelphia: Taylor & Francis Inc.
- World Economic Forum. 2013. *The global competitiveness report 2013-14* (New York). Available at: www.weforum.org/reports/global-competitiveness-report-2013-2014

THE CHALLENGES OF MUSIC TEACHER COMPETENCIES FOR VOCATIONAL SCHOOLS TO FULFILL CREATIVE ECONOMY INDUSTRY DEMANDS

Ayu Niza Machfauzia
Yogyakarta State University
email: ayu@uny.ac.id

ABSTRACT

Music competence is an important factor to generate interest of students towards music learning. Therefore, the music teacher continuously need to improve their professional performance in the field, such as developing the music playing skills possessed, and develop perspectives on values of music perception. It is necessary to produce graduates who can meet the demands of the creative economy industry. This paper aims to reveal the competence of music teacher in secondary-level vocational school which include pedagogical competence and professional competence. This research is a qualitative case study approach. In this study, music teacher who teaches the practice of the instrument selected as research subjects, numbering 12 people. Observations were made in every classroom where the teachers was taught. The teaching process was videotaped and reviewed. Afterwards, conducted semi-structured interviews with teachers. Data were analyzed using an interactive model which include data reduction, data presentation, and data verification. Finding reveal that competence of teachers in instrument practice teaching in vocational school is still need to be improved, both in terms of pedagogic as well as professional competences. If music teacher competence is a good, it can have a positive impact for students to instrument practice. Students will learn well in playing an instrument or singing when students heard their teachers do the same.

Keywords: music teacher, vocational, competency, industry creative

I. INTRODUCTION

There are an expression of Thuraw (in Rajasa, 2008: 1) that in the 21st century will be the increasing role of human creativity and innovation (human ingenuity) as an essential element in determining the benefits and success of the economic growth of a nation. Economic growth could not be separated from an economic activity that is associated with creating or using knowledge information. It can also be called the creative economy industry. Howkins (2001) explains that the creative economy industry is an activity where input and output are the idea. In the creative industry, there are various aspects related to knowledge and skill. Ruth (2011: 3) explains that the creative industries include activities that have the knowledge and skills of a person in individual creativity, skill and talent, and which have the potential wealth and job creation through the generation and exploitation of intellectual power. The statement could be said that the creative industry required knowledge competencies, skills, and talents.

In Indonesia, the creative industries can be referred to as the culture industry or the creative economy (Fachri, 2016). In addition, the creative industry is said to be a product produced by the creators, especially in the arts, including music, and performance art. This was stated in the creative industry grouping initiated by the Ministry of Commerce of the Republic of Indonesia. The Department has classifies creative industries into 14 industry groups (subsector) Indonesia (Taufli, 2016: 7), and one of them is music. The statement was reinforced by Rajasa (2008: 5) that music is one of the areas of art contained in the spectrum of the creative industry, which includes songs, concerts and song composition. Related to this, Rajasa (2008:4) describes that as a consequence, in the era of the creative industries required the existence of various forms of new work (future of work) which of course is all forms of work that are loaded with the demand to continue the accumulation of knowledge and skills to produces a wide range of new innovations. Thus, in order to create new jobs (future of

work), especially in the field of music, vocational schools in the field of music have a responsibility to prepare graduates who are ready to work in the industrial world, one of them as a music performer.

In order to become a musician (in particular played the works of Western art music), Britten (2007:91) suggest that a person must have the ability to play a musical instrument above average, and have the ability to act on stage. Additionally, a musician needs to know the repertoire which is played well. Based on this, it can be said that a musician is not enough just to play any instrument well, but also need the ability to analyze a piece of music being played. It is not in spite of their good teacher competence in these fields, which can provide the knowledge and skills of playing music is also good on the students.

Based on preliminary studies, that have been done, the data showed that there are many graduates from vocational school musical expertise (SMK Negeri 2 Kasihan Bantul) that has music playing skills below average. That is students only played a piece of music is played like what is written on the score alone. Most of the teachers who teach musical instrument practical learn impressed only teach how to read notation fluently, without discussing other musical aspects contained in the music scores.

Based on these problems, it can be submitted questions as follows: such as whether the competence of music teacher at a vocational schools to fulfill the demands of working in the creative industries? From these questions, then the purpose of the research was to uncover the competence of music teacher at a vocational school to fulfill the demands of working in the creative industries.

II. METHOD

The case study is a type of research used in this study. The use of case studies in this study (Gerring, 2007: 12) because the study of individuals (teachers) in depth to help him obtain a good adjustment. In addition, this study is an empirical research that investigates the phenomenon (Yin, 2008:18) in the context of the competence of music teacher at a vocational school in the

face of the demands of creative economy industry.

The research was conducted at SMK Negeri 2 Kasihan Bantul Yogyakarta in August to December 2012. The conduct at the school because this vocational school is the only vocational school of music expertise that consistent to conduct western art music learning, so it is interesting to examine what kind of music teacher competencies especially pedagogical competence and professional competence in dealing with the demands of creative economy industry.

Music teacher were teach especially music instruments practice learning of the amounting 12 people are subject of research and determined purposively is determined by adjusting the purpose of research. It determines these teachers as a research subject because teachers play a major role in any education system, including music education. Teachers will teach and instill the knowledge of its music to students. In addition, teachers will also teach and prepare skills in students through musical instrument practice learning. Other research subjects are principals, students, and the chairman of the public relations field.

This case study was conducted in three steps, namely pre-field, on the field, and after the field. In the pre-field stage, performed obtaining research permits for preliminary studies as well as to research, prepare guidelines for interviews, recording device such as cameras, handy-camp, and note book. Therefore, qualitative research method more emphasis on process rather than outcome, so to meet the accurate results can be seen from the process be completed, so this study puts the researcher as the primary instrument in extracting and processing the data obtained.

In the post-field stage carried out a series of process data analysis and interpretation of the data that has been obtained previously. The data have been analyzed, written in the form of a report. Related to this study, data were collected as evidence obtained through the use of four different data collection techniques, namely (1) in-depth interviews; (2) observation; (3) documentation; and (4) a focused discussion (FGD). Interviews were conducted face to

face (Gilham, 2000, p. 62) to provide flexibility in communicating with research subjects, in this case the teachers who teach the practice of the instrument that is Drs. Gmr I (Clarinet dan Saxophone); Brn Ari, S. Sn. (Trompet); Drs. Stn, M. Pd. (Oboe); Sprj, M. Sn. (Guitar); Fd, M.A. (Biola); Brg Brt W, EP. (Cello) ; Fr Gf. S. Pd. (Violin); Drs. Sdrt (Contra Bass); Utr, S. Sn. (Piano); Drs. Lg Smj (Vocal); and Dra. Yhn L.S. (Vocal). The interviews were conducted after the completion of teaching and at rest. The questions asked are not separated from the interview guides were prepared. However, it is possible questions were raised spontaneous but on the issues studied.

Passive participant observation is an observation made directly to an object that is observed in a natural setting. In other words, the researchers has been directly observed the competence of teachers in teaching of music instrument practice learning, but is not involved in the learning process. In practice, the simple observation that consists of three elements do (Gillham, 2000, p. 45), namely (1) to see what the teacher taught related learning activities of music instruments practices implemented by teachers according to a predetermined schedule; (2) listen to what the teacher says; and (3) at any time ask the teacher to explain the questions posed. Obtaining data are recorded observations that have been made and recorded in the form of videos and photos.

Documentation used to obtain the necessary data. In this study documents that use a form of writing and an image (Sugiyono, 2012, p. 82). A written document in the form of instrument practice syllabus, while the documents in the form of images are photographs and videos during the learning process takes place in the field of documenting results. Figure 1, 2, and 3 is an example image in the instrument practice learning.

The data was obtained through interviews, observation, and documentation was further verified through focus group discussions (Focus Group Discussion). FGD itself is a data-gathering activity by means of discussion groups to discuss the issues that have been determined, and is done in a

systematic and purposeful. FGD in the research was conducted on January 21, 2012 and attended by 4 teachers instrument practice as research subjects, and is facilitated by one moderator and assisted two people who helped record the course of the implementation of the FGD. The subject of discussion in this FGD associated with the competence of teachers, especially in the instrument practice learning.



Figure 1. Teacher was guided student Class XI for playing cello together



Figure 2. Teacher were pay attention to student class XII in playing scale.

Data analysis consists of three stages: before entering the field, while in the field, and after completion of the field. Analysis of the data before entering a field is analyzing the data from preliminary studies, which are used to determine the focus of research. Preliminary study results show that in playing a piece of music, student was direct

reading scores of the song, while the teacher only directs how to read notation correctly. It is more impressed that teachers simply transferring knowledge to students. Whereas in playing a piece of music, especially works of art music, not only with the correct notation reading skills are required, but also necessary to discuss the aspects contained in the musical scores played.



Figure 3. Teachers were Teaches Students Singing Technique

The analysis while in the field is done interactively (Miles and Huberman, 1994; Sugiyono, 2006) and carried out continuously until the data collection is completed. At the time of interview and observation, analyzing the answers given and to the phenomenon observed.

The components in analyzing the data interactive model (Miles and Huberman, 1994, p. 10) used in this study consisted of (1) the reduction of data, (2) present data, and 3) concluded / verify. Data reduction is done by summarizing, retrieve data and important subject, and make categorization. The steps in the data reduction (Lacey & Luff, 2001; Patilima, 2011) were performed in this study, namely transcription, organizing data, recognition, and coding. After the data reduction is done, the next step is to present the data. In this study, the data presented in the form of narrative.

In this study, the competence of teachers in teaching practice instrument is presented in the narrative, the last step of the data analysis interactive model is the conclusion. The findings in this study is the weakness of teachers in teaching instrument

practice. The form is less detailed weaknesses in teaching instrument practice. That means more teachers to teach the technique of playing a musical instrument/singing technique; while the theories related to a piece of music being played is not taught in detail including musical interpretation. In addition, teachers are less motivated students to be able to play a piece of music well.

III. RESULT AND DISCUSSION

In instrument practice learning, there are many important aspects that need to be taught to students, in addition to the related of techniques of instruments playing. In this lesson, students are not only equipped with the skills to play the instrument, but also equipped with the knowledge and ability to interpret a piece of music being played. In addition, teachers can also provide and explain the anatomy of musical instruments being played. This is required as one of the stock of knowledge for students in treading the world of work in the field of creative industries, such as a musical instrument designer, and as a musical instrument repairer.

Basically, the necessary competence possessed by the music teacher is a personal competence, competence pedagogy, musical competence, and teaching philosophy (Leung & Wong, 2005). These competencies need to be integrated with each other to strengthen the capacities of teachers overall.

Based on the observation that has been obtained, it can be said that almost all the teacher practice instrument that is the subject of research has competence personality. That is, in practice teaching instruments, teachers communicate with relaxed conditions, especially when guiding students in reading scores. It was also revealed in an interview with the student (Gt) class XI in grade saxophone as follows.

*"Mr. Gmr is good teacher and cool also".
(Prsp).*

Another opinion about the teachers are fun, there are also the interviews with students (Nnc) in the class XII class vocal B following.

"I like taught with Mr. Lg Smj. He is good and passion, and he also diligent". (Prsp)

In addition to those two opinions, the students of class XII (Ar) in a vocal class A the same point. This is seen in the results of the interview follows.

"Mrs Yhn L.S. is kind teacher, good teaching. She always give us example how to sing". (Prsp)

The expression of the three can be explained that in teaching practice teachers instrument showed a fun person, so that students can follow the lesson well. However, good personality of the teachers, not infrequently utilized students who are not ready to practice the instrument is not present in learning. In fact, it is not infrequently dispensed learning process. It is as revealed in interviews with the vocal coach A (Yhn L.S) below.

"If student is not already to practice, it's ok, there's no teaching and learning. (Kmpt)

The condition occurs also in the piano class with teacher Utr. In this class, if students are not ready to practice, then the learning process is not held. The statement is proved by the results of the interview follows.

"Sometimes, students are not already to practice piano. If students are not already to do that, I'm not teaching". (Kmpt).

Based on what has been obtained from these interviews it appears that even if teachers have a good personality, but do not have the firmness in teaching. This is shown by the students who are not ready to follow the practice learning the instrument, but the teacher let the students not to practice. In fact, such a situation can be used by teachers to motivate students, and a discussion about the learning material is played. In addition, teachers lack the assertiveness of the

students in dress. That is, the teachers lack of concern for the appearance and attitude of the students in the following study. In this case, the teacher has just focus on students' skills in playing the instrument.

With such situations, teachers need to improve the competence of pedagogy owned, among others, increase awareness and understanding of the characteristics of vocational students in which students are students who are stepping adolescence, and assist students in developing his musical abilities. Attention and understanding of the students not only on the intellectual aspect only (Mulyana, 2010: 104-105), but also on aspects of physical, moral, spiritual, social, cultural, and emotional. Thus, teachers have a responsibility to create an optimal environment in each of the learning process, and be able to actualize the potential of students, especially in interpreting a piece of music being played.

In line with pedagogical competence of teachers needs to be improved and developed, the professional competences of the teachers also seem to need their improvement and development. It was said, because in conducting practice learning instruments, some teachers lack a good motivation to improve their knowledge and skills in the field of music. In addition, teachers are less vigor in developing the professional capabilities possessed. This was evident from interviews with Yhn L.S. (Vocal teacher A) below.

"Yes, I'm old could not think anymore. Yes it is like this only, playing with children and grandchildren". (Kmpt)

Similar phrases with a vocal teacher, emerged from Spj (guitar teacher) who showed a lack of enthusiasm in improving professional competence, and this is seen in the results of the interview follows.

"It's hard, mom ... to learn more ... it feels really heavy yes ... I have no time also no longer ... already full with tasks". (Kmpt)

Based on the results of these interviews, it can be said that the motivation

of teachers in improving professional skills, especially related to increased knowledge about music is still low. There are some things that seemed to be obstacles, such as age and employment factor. In fact, in teaching music is need for a balance between theory and practice, including knowing and explore aspects of musical within a musical work, for a musical performance can be a better and meaningful. Meanwhile, according to Leung and Wong (2005: 8) musical competence (professional competence) is an important factor to arouse the interest of students towards learning music. Therefore, teachers are required to continue to develop and improve the competence of music (professional competence) which has, among others, is to master the skill of playing musical instruments including interpret a piece of music being played. This is a provision that can be given to students to be able to enter the industry in the field of music.

It is undeniable, one of the most important aspects in learning component is the teacher. Teachers as agents of learning (Mulyana, 2012: 104) serves to facilitate students to learn comfortably and successfully mastered the competencies that have been determined. Therefore, teachers need to have professional competence, especially professionals in the field. This is necessary, so that the teacher can design the lesson well, so that the learning process itself could be run as expected and obtain optimal results. Competence itself (Sembiring, 2009: 39) is a set of knowledge skills and behavioral tasks that must be owned, lived, ruled, and realized by teachers in carrying out the task of professionalism in the classroom called the teaching / learning.

As described in another section, that the competence of music teacher (Leung and Wong, 2005) consists of personal competence, competence pedagogy, musical competence of teachers and teaching philosophy. These competencies are not much different from the general competence that must be possessed by a professional teacher, namely personal competence, pedagogical competence, professional competence and social competence.

From the research that has been described related to the competence of teachers in teaching instrument practice, it can be said that the general competence of teachers both personal competence, pedagogical competence, and professional competence (in music), still needs to be improved and developed further. It was said, because even though the personal competence of teachers teaching instrument practice rated good and enjoyable by the students, but in fact the teachers were less strict in applying discipline.

This is evidenced by the teacher let the students do not follow the learning that should take place. This is because the student has not and does not even prepare their lessons well, so sometimes the learning does not take place as it should. It also makes a good teacher and students consider fun. However, there are times when the teacher also looks likely to support the unpreparedness of students in participating in learning. The statement disclosed based on interviews with Yhn L. S (A vocal teacher) that states do not implement the learning process, because their students are not ready to practice. Similarly, in the piano class with teacher Utr, the condition has shown that the personality of the teacher can influence the learning process. It is as it says Leung and Wong (2005: 2), namely *"personality and quality of teachers are another important factor affecting the teaching practice"*.

Furthermore, Leung and Wong (2005) explains that, according to Hare (1993) there are virtues and certain qualities that need to be owned by a good teacher as a person who provides quality and excellent performance in the learning process. The kindness and qualities include humility, courage, and impartiality, openness of mind, empathy and enthusiasm.

Thus, the presence of these conditions are can teachers motivate students to keep practicing hard and instill discipline in students to take responsibility for their future. Motivate students to improve student achievement in the field of music is one of the efforts of teachers to do so. It is as expressed by Asmus (1994) in Kwan (2002: 2) as follows.

Motivating student musicians to achieve is a constant focus of music teacher's effort. From recruitment, to keeping students involved in music study, to learning the fundamentals of scales, arpeggios, music teacher must constantly be alert to what motivates students and how best to apply these motivators to improve students achievement in music".

From the description, it appears that the teacher as motivator needs to continually guiding, motivating, and inspiring students to learn musical instruments, including learning practices in order to achieve success in the future. In addition, as a master communicator in the class (Harris, 2012: 32), the teacher can explain the purpose of instruments practice learning, including musical interpretation. As one of those goals that students could be present a piece of music played well. Additionally, students be able responsible artist in his field. Therefore, teachers can explain to the students that the music publisher virtuoso (Harris, 2012) will communicate the piece of music being played to the audience, and how it is not only done through the music he played, but also through its presence on the stage. It is expected that students are very animating and can connect with the audience and can give an impression of the musical performance that is performed.

Related to this research, teachers need to constantly motivate the students to excel in music learning, especially students who have a good musical talent. It is necessary for each student who followed the practice learning instruments in the class have different backgrounds and different individual needs. Therefore, teachers also need to understand the characteristics of students as contained in these indicators in pedagogy competence, one of which is a master student characteristic of the physical, moral, spiritual, and social, cultural, emotional, and intellectual. It is as mentioned earlier, that the attention and understanding of the students not only the intellectual aspect only (Mulyana, 2010: 104-105), but also on the physical, mental, spiritual, social, cultural, and emotional.

Therefore in this study conducted at the upper secondary level vocational school,

the students in these schools have their teens are aged between 15-19 years. At this age, especially teenagers class XII (Developmental School Counseling Programs in Sciarra, 2004: 133), should have the ability to complete the requirements for the transition from high school, made a commitment to career planning, understanding the potential with their changing interests or values connected with work, understanding the potential for change in the labor market, understanding the development of a career as a lifelong process, accept responsibility for yourself in career direction.

Seeing the nature of the students in their teens, it can be said that at that time, the student should have a commitment to the future itself. Students are more mature in making decisions. But all this can be realized if the guidance and direction of the teacher.

In order to students can follow the process of the instrument practice learning well, teachers can teach students (Harris, 2012: 143) not to think of practical exercises instrument as something unpleasant, boring, and only done if these students need to practice (practice) only. Therefore, to be able to steer, guide and motivate students in learning following the interpretation of the musical instrument in teaching practice, teachers can understand and recognize the student's behavior which includes actions, how to communicate, verbal language and body language of the student. By understanding and recognizing the behavior of the students are taught, the teacher can use the right strategies in teaching practice instrument

In addition to teaching the practice of the instruments, teachers can also conduct discussions with students in particular discuss the musical works played and discuss what she had heard. Teachers could be teach and engage students in the discussion (Young, 2010: 8). At events like this, indirectly teacher has been cultivating students' thinking skills, especially critical thinking.

Prior to discussion their duties, teachers can play and show the audio recordings and video game music of the masters. If this is done the teacher in practice

learning the instrument, then the teacher can help students to learn and grow (Young, 2010: 85), and this is a good practice to listen, reflect, and demonstrates how to play a piece of music being studied. If the discussion can enhance students' critical thinking skills, then the activities of listening to a piece of music that is played can improve students' ability to think a high level (high order thinking skills), as previously described.

But in fact, all the teachers are the subject of research in the teaching practice of the instruments is not doing these things. This shows that personal competence, professional competence of teachers, as well as pedagogical competence of teachers needs to be improved and developed further. Keep in mind, that the teaching of music one of which is to develop a deeper understanding of the students towards learning music, especially in the instrument practice learning. Therefore, teachers not only guides students in reading notation, but teachers can also developed the students' understanding of the aspects contained in the instrument practices learning. Thus, the teacher needs to improve its professional competence, because teachers play an important role (Leung and Wong, 2005: 2) on the quality of learning.

Professional competence referred to here is the competence of teachers in the field of music, and competence in the field of this music (Leung and Wong, 2005: 8). That is an important factor for backing arouse students' interest in music and his involvement in music education. In this competency, the teacher not only has the ability and skill in playing a musical instrument, but also has the ability in mastering the learning material including control over the aspects contained in a piece of music being played. Competence of control of these materials (Mulyana, 2012: 103) needs to be owned by teachers is broad and deep that allows teachers to guide students to meet the standards of competence specified in the national standard of education.

From the research results related to the competence of teachers in teaching practice instrument that includes personal

competence, pedagogical competence, and competence owned music teacher (professional competence), it can be said needs to be improved and developed further.

This is necessary because teachers teaching agent role to facilitate and motivate the student to learn optimally and in a supportive environment, so that students can master the competencies that have been determined that it can present a piece of music played well.

Thus, in order that students can master the competencies that have been determined well, then teachers need to have a professional nature. That is, the teacher has the nature of desire to continue to develop themselves in the field of music, including developing self respect to the instrument practice learning. In addition, teachers are expected to have a personality that can serve as an example for students. In other words, teachers can have a function as a model example and as a facilitator in the classroom.

This is in accordance with the motto Taman Siswa founded by Ki Hajar Dewantara namely *Ing Ngarso Sung Tuladha, Ing Madya Mangun Karso, Tut Wuri Handayani*. As for the meaning of this motto that if you're in front, of the teacher as a leader should be able to set an example. When he was in the middle, teachers as a leader could be motivate and provide mentoring, and while at the rear, the teacher as a leader should be able to act as a driving force, supporters and protectors for students who led (Mulyana, 2012: 201).

With regard to these results, it can be said teachers still lack the professional nature that nature to continue to develop themselves, as well as a lack of effort to motivate both motivate yourself and motivate students.

IV. CONCLUSION

Based on the research results that have been obtained, it can be concluded that the competency of music teachers, especially that teaching the instrument practice to meet the demands of creative economy industry still needs to be improved and developed more specifically pedagogical competence and professional competence.

It is evident from the following results that the competence of teachers in teaching instrument practice is still need to be improved, both in terms of pedagogic and professional competence. From the pedagogical competence in carrying out the study it appears that teachers only see students playing a piece of music, teachers are less motivated students, and do not teach music playing skills in detail, so that students are less able to develop various academic potential, and facilitate students to develop a range of non-academic potential. It is obtained from observations and interviews that show a lack of rigor and discipline of the teacher to student in the process instrument practice learning. Meanwhile, professional competence, it seems some teachers have a deep understanding of the aspects contained in the instrument practices learning that need to be taught, as well as the strategies used in the study. Moreover, the lack of understanding is needed to integrate theory and practice in instrument practice learning.

Thus it can be said, to be able to meet the demands of Asean Economic Community in the field of creative industries (in this case music performance of), required an important aspect of the competence of music teacher is the ability to assimilate the characteristic features of a piece of music, namely with regard to the content of the music and the characters expressive, and techniques and strategies used to convey it.

REFERENCES

- B. Miles & Huberman, A. M. (1994). *Qualitative data analysis*. California: Sage Publication, Inc.
- Britten. (2007). *Working in music industry: how to find an exciting and varied career in the world of music*. Oxford: Spring Hill House.
- Fachri. (2016). *Industri kreatif*. Downloaded at 27 August 2016 from <http://agribisnis.co.id/industri-kreatif/>.
- G Young. (2010). *Enhancing the professional practice of music teacher: 101 tips that principals want music teacher to know and do*. New York: Rowman & Littlefield Publishers.
- G. Sembiring. (2009). *Menjadi guru sejati*. Yogyakarta. Best Publisher.
- Gerring (2007). *Case study research: principles and practices*. Cambridge: Cambridge University Press.
- Gillham (2000). *Case study research method*. London: TJ. International, Ltd.
- H. Rajasa. (2008). *Menggagas sumber daya manusia kreatif dalam membangun bangsa di masa depan*. Downloaded 9 January 2009, from http://www.setneg.go.id/index.php?option=com_content&task=view&id=1667.
- Harris, (2012). *The virtuoso teacher. The inspirational guide for instrumental and singing teachers*. England: Faber Music Publisher.
- Howkins. (2001). *The Creative Economy: How to Make Money Ideas*. London: Penguin.
- K Yin. (2008). *Case study research design and methods*. Fourth edition. California: Sage Publication.
- Patilima (2011). *Metode penelitian kualitatif*. Bandung: Alfabeta.
- Ruth S. (2011). *Skills for creative industries graduatesuccess*. Education and Training, 53(1), pp. 9-26.
- S. Taufli. (2016). *Creative Industry*. Downloaded in 25 Agustus 2016, from https://www.academia.edu/5210086/Creative_Industry.
- Sugiyono. (2006). *Metode penelitian kuantitatif kualitatif dan R & D*. Bandung: CV. Alfabeta.
- W. Leung & P. W. Wong. (2005). Matching music teacher's self conception with students' perception on teaching effectiveness in an unfavourable secondary classroom context. *Journal of Education Musical*, vol. 2, number 1 (English version), p, 1-12.
- Z. Mulyana, (2010). *Rahasia menjadi guru hebat*. Jakarta: Grasindo.

INDONESIAN VOCATIONAL TEACHERS EDUCATION DEVELOPMENT

Putu Sudira

Electronics Department Engineering Faculty Yogyakarta State University
Technology and Vocational Education Graduate Schools Yogyakarta State University
Email: putupanji@uny.ac.id

ABSTRACT

Professional teachers in vocational education is one the determinants of the quality of Indonesian workers. The quality of vocational education in Indonesia is very dependent on the availability of professional teachers at all membership packages, which was held at VHS. To produce qualified teachers needed standardization of vocational teacher competence. Provision of professional vocational teachers is need education vocational teachers who apply the principles of good vocational education. FE and FETV own core business and hold the responsibility as a provider of professional vocational teachers. Vocational teacher education is an education for the world of work in vocational education. Vocational teacher education is need to uphold the principles of workplace-based education in the field of vocational education.

Keywords: vocational education, vocational teacher, vocational teacher education

I. INTRODUCTION

Developing competitiveness and collaboration capacities of Indonesian workers can be done through Technical and Vocational Education and Training (TVET). High quality TVET and relevant to the needs of the world of work becoming a determinant factor employability skills Indonesian workers. Indonesia has set important policies related to vocational education and training. This policy is changes the ratio between Vocational High Schools (VHS) and High School (HS) to 70:30. Implications of this policy are very broad in the TVET system in Indonesia. The policy causes: (1) the participation of the private community and local governments increased in the build VHS; (2) the image of vocational school as a school for the world of work is improved; (3) increased public confidence in the vocational school; (4) access to education more widely; (5) the supply of skilled labor in the number of middle-level rise; (6) changing in Indonesia labor structure; (7) vocational teachers employment increased; (8) occurs challenges preparation of pre-service and in-service vocational teachers. Changes of the ratio in some areas has reached 68:32.

Increasing the quantity of VHS has happened in the last eight years is a challenge for TVET Teachers Institute (TVET-TI) in upgrading TVET teachers

comptence. How TVET-TI build networks and cooperation with vocational education foundations and local governments? Establish partnership with business and industry? Developing entrepreneurship among VHS students? How TVET-TI mentoring the development of quality vocational education in Indonesia? How TVET-TI develop programs to providing professional vocational teachers who are ready and establish to work at VHS? How TVET-TI committed to making the arrangement functions as an institution to train and educate vocational teachers? Development of vocational teacher education is important in order to avoid vanity-sian vocational education services due to poor education and learning, bad learning outcomes, discrimination in access to vocational education in remote and outlying areas, gender, race, and lack of ability. Shifting the focus of several TVET-TI's in Indonesia from the principal function as a developer of vocational education and vocational teachers to the field of pure subject add complicated problems in the development of the workforce through vocational education in VHS.

Educational and training programs for vocational teacher training in TVET-TI be an important variable in improving the quality of vocational education at VHS. Provision of

professional vocational teachers who have the capability to understand the principles, the objectives, benefits, strategic objectives, and changes in the context of vocational education is an important issue. How TVET-TI anticipates and develops vocational teacher education programs? How TVET-TI doing research to mapping the needs of teachers kualification in all regions of Indonesia? How can the government facilitate TVET-TI in the provision of vocational teacher professional? How to develop sustainable vocational teacher professionalism? This paper discusses the development of vocational teacher education in Indonesia.

II. DISCUSSION

2.1. Vocational Teacher Education as a Profession

Indonesia through the State Constitution, namely Law No. 14 Year 2005 on Teachers and Lecturers enact that teacher is a dignified profession. Work as a teacher is a person's source of income. Meaning: Teacher including the vocational teacher is a job or profession recognized and maintained her dignity, very strategic role and functions, as well as appreciated by the nation constitutionally. The recognition of the dignity and the teaching profession vocational officially has lasted 11 years unfortunately have not followed up with the development of education system, training, assignment, and vocational retraining of the teaching profession to increasing sustainable and measurable quality.

Concrete efforts to realize the education, training, and retraining of qualified vocational teacher face the changing demands of the world of work is a necessity. Efforts developing professionalism of vocational teachers can be done through: (1) the provision of university-based teacher; (2) school-based induction of beginning teachers; (3) the professionalization of teachers based on the initiative of the institution; and (4) the professionalization of teacher based-on individual capability (Agency PSDMPK-PMP). The role of the Faculty of Engineering (FE) and the Faculty of Education Technology and Vocational (FETV) at the University of

Teacher Education Institute (TEI), the Indonesian Teachers Association (PGRI), the Association of Indonesia Technology and Vocational Education (APTEKINDO), the Association of Lecturers and Teachers of Vocational Indonesia (ADGVI) is critical.

Preparing and meeting the needs of vocational teachers as a dignified profession are an importants task Government together with the FE, FETV, APTEKINDO and ADGVI. The principal tasks of the FE and FETV is to educate and train prospective vocational teachers, develop the science of Technology and Vocational Education (TVE) and confirms that the Vocational Teacher Education (VTE) is the Vocational Education (PV). PGRI, ADGVI, APTEKINDO jointly oversee the professional development of vocational teachers. Increasing competitiveness and collaboration capacities of Indonesia workers requires the study of: (1) how does the model of vocational teacher education as vocational education transformative carried out? (2) How is the commitment and consistency of FE and FETV in developing vocational teacher education as vocational education? (3) How professional development and career vocational teacher? (4) How to model assignment vocational teacher candidates?

Development of vocational education teachers need to understand the new context of the global TVET. Technical and Vocational Education and Training (TVET) system is no longer reserved only to educate and train people to do the jobs that are already well established in the world of work, but to develop individual creativity and innovation communities to be more productive and ready to face any form of change. TVET experienced a shift from the concept of TVET for employment to TVET for employability. Even UNESCO wants TVET as an instrument for the promotion of sustainable development and prepare people become independent learners and responsible to himself (Hollander & Mar, 2009: 42). TVET for employability is education and training develop skills which enable people to gain, keep and progress within employment, including skills in the clusters of work readiness and work habits, interpersonal skills and learning, thinking and adaptability

skills. Employability is the degree of adaptability an individual demonstrates in finding and keeping a job, and updating occupational skills. Relates to portable competencies and qualifications that enhance an individual's capacity to make use of the education and training opportunities available in order to secure and retain decent work (MakKenzie & Polvere, 2009: 65).

TVET are employability, sustainable development, self-reliance and responsible clearly needs professional teachers and lecturers. Vocational teaching profession occupies a strategic position in the process of education, teaching, coaching, training, guidance, assessment, and evaluation of students in vocational education and training. Vocational teachers can develop the skills and capacity of Indonesian workers. Vocational teachers can build learning communities, building a knowledge society and to develop their personal capacity to continue to innovate and make changes (Hargreaves, 2003: 9). Professional vocational teacher is one of the determinants of the quality of vocational education. The direct impact is the quality of Indonesian workers. Vocational teaching profession requires skill, finesse, skill, commitment, idealism, responsibility and competence of certified vocational educators with quality and standardized norms. Standardization of vocational teacher competence is very urgent to do in order to improve the quality of vocational education in the country and improving the quality of labor.

2.2. Vocational Teacher Education is the Vocational Education

Vocational teacher education is education that prepares graduates to work. Vocational teacher education organized for the development of capabilities (ability and willingness) that grow on the basis of talent, interest, call the soul, idealism, commitment to improve the quality of vocational education. Vocational teacher education is vocational education for employability as educators, teachers, counselors, coaches, directors, assessors and evaluators of education and vocational training. Structuring vocational teacher education as vocational education is important to the FE

and FETV. Vocational teacher education is not education for the sake of education. Vocational teacher education is an education and training development capability oneself into professional vocational teachers who master in the principles of vocational education. FE and FETV needs to declare its commitment to make vocational teacher education as vocational education. The main task or core bussiness of FE and FETV is educate and train vocational teacher candidate.

Vocational teacher education is urgent to continue to be developed. Needs of vocational teachers is increasing in line with the policy changes in the ratio of VHS: HS 70:30. Vocational teacher education curriculum geared to achieve the objectives: (1) understand the working life as a vocational teacher in VHS; (2) develop the self capacity as a teacher to be able to perform role as educators, teachers, counselors, directors, trainers, assessors and evaluators; (3) control of learning in the classroom, laboratory, workshop, workshops, and field; (4) developing the capacity of themselves as teachers are critical in the field of vocational education; (5) transforming the practices of social work as a vocational teacher work pays off; (6) taking care of themselves as teachers of vocational capacity to work long-term; (7) develop a sustainable professionalism appropriate to the development vocational education; (8) develop their capacity according to the needs of vocational education sector; (9) practicing the capacity as teachers that work as educators, teachers, counselors, directors, trainers, assessors and evaluators with a full appreciation and concern in the community; (10) develop the capacity to contribute to the economy through vocational education.

Professional vocational teachers in the 21st century must understand the global development of the knowledge-based society. The development of a knowledge-based society requires that vocational teacher education is transformative. Vocational teacher education should be able to transform the content of education as a process undergoing changes. 21st Century vocational teacher education is education

that leads to: (1) build a cultural transformation of techno-science-socio-cultural; (2) the fulfillment of the social aspects of efficiency to get a job or have a decent, proper, good, polite (decent work); (3) increasing the capability of career positions so self-sufficient in meeting the welfare needs; (4) the mastery of skills through and meet the needs of life (life skills) private self in the family, community, nation, and state; (5) the mastery of skills for lifelong learning from real life; (6) increased innovation application of critical thinking skills, creativity, communication, and collaboration (Pirto 2011; Trilling and Fadel, 2009); (7) to improve the skills to use information and multimedia.

Vocational teachers as a catalyst for change to build a new professionalism that is: (1) promote cognitive learning up on high order thinking skills include creativity, critical thinking, collaboration, communication (Pop, 2005; Cotrell, 2005); (2) teaching in new ways that have never been taught; (3) commitment to continuous learning as a professional teacher; (4) work and study with other teachers as colleagues in educating, teaching, guiding, directing, train, assess, and evaluate students; (5) to treat other teachers as partners in learning; (6) develop collective intelligence; (7) build the capacity of teachers who are ready to change and are at risk; (8) encourage mutual trust among fellow teachers in the learning process (Hargreaves, 2003: 24); (9) live up to the meaning of the word GuRu comes from syllable Gu means darkness and Ru means light. Guru are the transformers of society from dark to light (Sudira, 2014).

The principle of professionalism of teachers contained in article 7 of Law No. 14 Year 2005, namely: (1) have the talent, interest, call the soul, and idealism; (2) a commitment to improve the quality of education, faith, piety and noble character; (3) has the academic qualifications and educational background in accordance with the task; (4) have the necessary competence in accordance with the task; (5) has the responsibility for the implementation of the tasks of professionalism; (6) earn income determined in accordance with job performance; (7) have the opportunity to

develop in a sustainable manner with the professionalism of lifelong learning; (8) have legal protection in carrying out the task of professionalism; and (9) have a professional organization that has the authority to regulate matters relating to the duties of professionalism of teachers. Being a professional vocational teacher should have the talent and the high interest, called his soul as a teacher, high ideals and committed to improving the quality of education and responsibility.

According Day (1997, 52) a key concept of professionalism in successful policies and strategies of teacher professional development depend on three aspects: (1) *self-esteem through positive rewards such as encouragement and support (without political, social, economical and organizational recognition and support, teachers' self-esteem will be in jeopardy)*, (2) *teaching skills are not enough maintaining and developing individual and collective vision comes through the career-long committed professionalism of teachers; and finally, (3) for teachers to become experts in learning requires continuing professional development.*

Teachers are not ordinary workers. Teacher jobs more than other workers. Teacher every day faced with a unique learner himself each extraordinarily diverse. Teachers must have extensive knowledge in the process of building a learning community. Teachers candidate must first take academic courses at S1. After completing academic education in S1, the vocational teacher candidates then follow the professional education of teachers. In the process of teacher professional education teacher candidates to learn and develop their personal capacity corresponding on 10 vocational education demands of the working world above. Vocational education teacher professional learning outcomes are programmed in order to qualify and criteria become professional vocational teachers. Vocational teachers have to understand the development of business and industry, have experience working in business and industry. Thus the development of professional competence of vocational teachers through professional development of vocational teachers is not enough only

carried out at the school alone. There needs to be industry practice and the practice field at the school.

Vocational teacher education quality assurance begins with the selection process of student input-based talent and interest, competency-based learning process in universities and vocational, measurable learning outcomes. Selection input of new students apply the selection of talent and interest, so that students who netted truly who has a calling and idealism as a vocational teacher. Other demand that also needs to be improved is the commitment of prospective teachers to improve the quality of education, faith, piety, and noble character.

Professional education according to John (2008, 12) is a university-based education and training with empirical knowledge, motivated by the welfare of the people who are served, committed to lifelong learning, performed independently with a high degree of quality self, has a code of ethics. In Javanese philosophy that teacher is a person who "*sugih tanpa bandha, nglurug tanpa Bala, menang tanpa ngasorake*" which means Rich lot of students not material, has the ability to enlighten, independently confront his students, and his bow without defeat. Teacher professional education including vocational teaching profession had clearly become part of vocational education. Vocational teacher education was organized to educate and train prospective vocational teachers in carrying out its duties to work as an educator, coach, tutor, teacher, chaperone students in VHS.

2.3. Vocational Teacher Education Prospek

Prospects of vocational teacher education are always evolving. Vocational education as an educational world of work is always in need of professional vocational teachers with high qualifications. Faculty of Engineering (FE) Yogyakarta State University and Padang State University since 1979 was appointed by the Indonesian government as a producer of vocational teachers through a World Bank project 1979. FE Yogyakarta State University has proven to produce excellence vocational teachers. They

are a lot of doing well in VHS. Alumni FE Yogyakarta State University successful work as teachers in vocational schools in all provinces in Indonesia, especially in the expertise areas of Engineering Technology and Information Communication Technology.

The success of the FE Yogyakarta State University graduated high quality teachers in VHS is an advantage that should continue to be developed. If FE and FETV former University Teachers' Training College no longer focus on vocational teacher education and development of educational sciences and vocational technology then almost certainly the development of vocational education in VHS future we will be in trouble. If vocational education in VHS trouble then our national education system is also facing a big problem, because the ratio of VHS: HS already towards 70:30. In 2025 our nation will be built and characterized by VHS outcomes. It takes enforcement thoughts vocational education program preparation. Enforcement of quality vocational teacher preparation program requires structuring the concept of vocational educators and the education system.

Understanding the philosophy and concept of vocational teacher education, as education for the world of work needs to continue to be socialized. Likewise, the understanding of vocational education needs to be deepened and broadened within the teacher education institutions, because not all lecturers have a background in vocational education. Education vocational teachers are no longer enough to run just as regular education because education vocational teachers require planting the values, skills, knowledge of good work, able and willing to perform or appear educating, teaching, guiding, directing, train, assess, and evaluate students in classes in various skills. Value investment in teacher must be built from scratch entering education courses.

Vocational education system also needs to be organized and enhanced in line with the changing educational context. The progress of science in giving explanation through inquiry and discovery and the development of engineering and technology in solving social and economic problems

through the design and discovery of new technologies is of particular interest as a dynamic educational context. Input and education processes developed to meet the standards of education including student selection system. Effective selection system for new students and the learning process that fully utilizes the principles of education and vocational training to make graduates fit and ready to perform the job duties as teachers and education personnel in VHS.

New student selection system for vocational teacher candidates is done through a selection of the best graduates of VHS and HS and talented as teachers and interest in becoming a candidate for all courses of expertise. Selection VHS and HS graduate gifted and interested in becoming a vocational teacher conducted across the province. A bond system also needs to be done so that after graduation they returned to their respective regions and serve as an educator at a local vocational school. This way also suppress mutations teachers among provinces so that ongoing professional development of teachers can work well at the same time can improve the quality of schools.

Vocational teacher education needs to transform education towards demand and market driven. Vocational teacher education should be more responsive and adaptable to the changes and demands of the new world of work as a vocational teacher professional. Vocational teacher education held in a dual based ie campus-based, industries-based and school-based. Vocational teacher education program organized by the contextual approach through improved communication, interaction and facilitation between the campus and the school so that students increasingly familiar with the field and her work duties. Education model used is competency-based education where teachers work profession will be maximized if the acquisition went well competence.

III. CONCLUSION

Vocational teachers are a dignified profession and constitutionally appreciated by the Indonesian nation. Development of vocational education teachers need to understand the new context of the global

TVET. TVET experienced a shift from the concept of TVET for employment to TVET for employability. Professional teachers in vocational always develop skills to gain, keep and progress within employment, including skills in the clusters of work readiness and work habits, interpersonal skills and learning, thinking and adaptability skills. Professional vocational teacher directly influence the quality of Indonesian workers. Preparation of professional vocational teachers becomes very important. Developing professionalism of vocational teachers can be done through: (1) the provision of university-based teacher; (2) school-based induction of beginning teachers; (3) the professionalization of teachers based on the initiative of the institution; and (4) the professionalization of teacher based-on individual capability

REFERENCES

- Billet.S. (2011). *Vocational education purposes, traditions and prospects*. London: Springer Science+Business Media.
- Cottrell, S. (2005). *Critical thinking skills developing effective analysis and argument*. New York: Palgrave Macmillan.
- Day, C. (1997) Teachers in the Twenty-First Century: Time to Renew the Vision, in Hargreaves, A. And Evans, R. (eds) *Beyond Educational Reform. Bringing Teachers Back*. Buckingham: Open University Press, pp. 44–61.
- Hargreaves, A. (2003). *Teaching in the knowledge society education in the age of insecurity*. Amsterdam: Teachers College Press
- Hansen, R. (2009). The pedagogical roots of technical learning and thinking. In R. Maclean, D. Wilson, & C. Chinien (Eds), *International handbook of education for the changing world of work bridging academic and vocational learning* (pp. 5-18). Bonn: Springer.
- Hollander, A. & Mar, N.Y. (2009). Towards achieving TVET for all: the role of the unesco-unevoc international centre for technical and vocational education and training. In R. Maclean, D. Wilson, & C. Chinien Eds), *International handbook*

- of education for the changing world of work, bridging academic and vocational learning* (pp. 41-58). Bonn: Springer.
- John, P.D. (2008). The predicament of the teaching profession and the revival of professional authority: a parsonian perspective. In David Johnson & Rupert Maclean, *Teaching: professionalization, development and leadership*. --: Springer Science + Business Media
- Neil, P. & Morgam, C. (2003). *Continuing professional development for teachers from induction to senior management*. London: Kogan
- Pavlova, M. (2009). *Technology and vocational education for sustainable development empowering individuals for the future*. Queensland: Springer.
- Pavlova M. (2009). The vocationalization of secondary education: the relationships between vocational and technology education. In R. Maclean, D. Wilson, & C. Chinien (Eds), *International handbook of education for the changing world of work, bridging academic and vocational learning* (pp. 1805-1822). Bonn: Springer.
- Piirto, J. (2011). *Creativity for 21st century skills how to embed creativity into the curriculum*. Rotterdam: Sense Publishers.
- Pop, R. (2005). *Creativity, history, theory, practice*. New York: Routledge
- Stevenson, J. (2003). *Developing vocational expertise principles and issues in vocational education*. Crows Nest: Collection John Stevenson.
- Sudira, P. (2014). *Guru unggul dalam pendidikan kejuruan*, (<http://eprints.uny.ac.id/30412/>), diakses 12 Juni 2016.
- Trilling, B. dan Fadel, C. (2009). *21st century skills learning for life in our times*. Sanfrancisco: Jossey Bass