

Becoming Vocational Teachers for 21st Century in Indonesia

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Abstract— Various efforts have been made by the government in improving the quality of vocational education in Indonesia. However, some research has been conducted by overseas institutions shows that the quality of teachers and graduates of vocational education still low performance. In order to address this issue, researchers used literature review to provide a solution regarding what is needed to be understood for becoming actual vocational education teachers in the 21st century. The aim of this study is teachers in vocational education must have competencies to produce competitive and competent graduates of vocational education in Indonesia with the needs of the labor market in the global market. In Indonesia, the study recommends that to become a professional vocational teacher of the 21st century, they must understand the foundations of vocational teacher's education, the competences of vocational teachers of the 21st century, the processes of vocational teacher education, and update knowledge and skills for competencies of vocational teachers according to industrial needs.

Keywords: *Vocational teachers, teacher competency, vocational education, vocational educational foundations*

I. INTRODUCTION

The growth of science and technology is always moving dynamically in industry both at national and international level. Technological developments have changed from industry 1.0 to industry 4.0. Previously, the industry only focused from human-based labor to more technology-focused industries in the 21st century. Indonesia as a developing country is also required to face this development.

This condition also has an impact to the demands of workforce competence. This is not only needs the competence of prospective workers in the industry but it is also teachers' competence of prospective workers, namely teachers of vocational education. They need to have up to date competencies according to the competencies required by the industry known as professional competence. In addition, other competencies necessary to possess are pedagogical, personality, and social competencies. This is in accordance with the competency standards required in teacher certification in Indonesia.

However, real conditions show that many vocational teachers and teacher candidates' educators have no the same understanding of the importance of a vocational teacher's competences in shaping students' competences as a competent workforce to compete in current global job market yet. They need to prepare their competencies in accordance with the dynamics of competence needs in the national and international labor market.

The study results of OECD [1] revealed that the major weaknesses of vocational education provided at secondary school level are less suited their graduates' competencies with industrial needs. Some education experts stated that teacher educational institutions need to prepare prospective teachers according to the needs of industrial competencies. Generally, the conditions in vocational education illustrate that teachers are generally more focused on routine teaching and learning activities in vocational education and they do not focus on link and match between vocational education and industrial partners.

Based on the above explanation, the author was inspired to provide an understanding how to become a vocational education teacher of the 21st century in Indonesia. The goal is to provide a framework for the preparation of vocational education teachers to policy makers, teachers, prospective teacher educators, and vocational education leaders. This concept is shaped through stages of understanding of the foundations of vocational education, the competences of 21st century vocational teachers, vocational teacher candidates' educational processes, and the renewal of vocational teachers' knowledge and skills. The hope is that teachers will have the responsibility to produce competitive and competent vocational education graduates in Indonesia in accordance with the needs of the global labor market.

The solution offered to overcome these employment problems so that the students have the entrepreneurial spirit and character is to change the learning pattern of the course "Entrepreneurship" which during this learning is only conducted in theory in the classroom, into work-based learning and life-based learning. The pattern used is to combine entrepreneurial courses that have been an only theory, designed to be work-oriented learning and life-oriented courses by collaborating several practical courses, such as the practical work of bench and welding practicum. The collaboration of this course will give birth to a new course as a substitute for the entrepreneurial course that has been going on, to be a life based entrepreneurial course in the field of welding.

II. METHODS

This paper used a literature review method to describe how to become vocational education teachers focusing on the framework for preparing vocational education teachers of the 21st century in Indonesia. Using 50 international journals and 20 international books regarding vocational

education, authors carried out verification and analyzed them.

III. DISCUSSION

To become excellent vocational education teachers in 21st century. They should have an understanding of foundation vocational education, have 21st century competencies, conduct vocational teacher candidates' educational stages, and update their knowledge and skills. Then, the following is its result explanation.

A. Foundations of vocational education

A vocational education teacher in Indonesia needs to understand the educational foundations clearly. It is important to know the importance from roles of vocational education in contributing to increase a country's economic growth. Furthermore, the explanation of the four foundations of vocational education is as follows.

1. Philosophy foundation

Philosophy is a collection or a particular belief system that resulted from the search for knowledge of life and the universe [2-3]. The main philosophy of vocational education is to provide training and skills required by individuals so that they become economically independent. It was mentioned by Kennedy [4] that the philosophy of vocational education is the choice of individual work based on individual orientation, such as: interests, talents, abilities, and others. Every individual needs an opportunity to choose a job that is suitable for his expectations and opportunities.

Thus, the value of each individual will grow from the contribution of knowledge, skills, and applications of their productive capacity to finish their work. Vocational education resources should be provided to develop all professional human resources. Resource allocation should reflect the needs of the industrial community. Priorities should be tailored to provide resources directly in accordance with the required investment costs. Everything is prepared to prepare competent and competitive graduates in the global labor market.

2. Economic foundation

The economic foundation is linked to the contribution of vocational education to economic stability and societal progress in a country [5-7]. Hoeckel [8] states that one of the contributions of vocational education for state economy is through the training of unskilled workers. So the economic transformation that is done automatically will bring changes in the demands of the skills of its workers [9-10]. The benefits of this kind of education provide many advantages, mainly to the state economy. When workers make the transition from unskilled workers to skilled, they increase the earning potential. Finally, their pay raises will have an impact on strengthening their economies.

3. Sociological foundation

Sociology is the study of human social life, groups and society. It is related to the human resources of vocational education that has the behavior of the subject

as a social being. The scope of sociology is very broad. The needs of society are also numerous and complex, such as basic human needs (food, shelter, and love), and the need to feel productive. In accordance with the sociological foundations, vocational education provides many basic human needs in several ways through work behavior, work result, education, social class, upward mobility, and technical competences.

4. Psychological foundation

The psychological foundation is related to individual differences, where each individual has a unique personality and has differences in their learning and skills. They are different in nature, so they cannot be treated equally in the learning process. Some students may quickly learn while some other students are slow in learning. Therefore, teaching and learning on vocational education should be based on that fact. All should be designed to support the capacity and potential of all students.

B. Vocational teacher's competencies in 21st century

Three components that need to be understood in discussing vocational teacher's competences of 21st century in Indonesia are the competency fields of vocational education teachers, new roles and competency requirements for vocational education teachers, and professional competence standards for vocational education teachers. The explanation is as follows.

1. Competency fields

Competency fields needed to master by vocational education teachers consist of four areas: administration, teaching and learning, development and quality assurance, and networking. These four components work integrated in order to build professional competencies for a vocational teacher so that they can keep pace with the changing developments of science and technology in the global labor market.

2. New roles and competency requirements

Eight elements that need to be mastered by a vocational teacher in Indonesia are technological developments in the job world, new target groups of learners, change of learning and teaching paradigm, cultural change, labor market development, internationalization, shapes, and changes of political priorities, and organizational changes. All of these elements support vocational education teachers to learn and teach professionally, as the primary responsibility of vocational teachers to train learners in order to have their work skills in their professional field.

3. Professional competence standards

The professional competence standards for vocational teachers in Indonesia that need to be mastered by them aim to map the various professionalism actions of vocational teachers. This standard consists of professional attributes, professional knowledge, and professional practice in teaching and learning activities. The professional competence standards for vocational teachers

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C. Vocational teacher candidates' educational processes

Currently, Indonesia has implemented vocational teacher education through two ways, namely traditional and alternative ways. These are done in order to prepare professional vocational teachers. The hope is that they are able to provide a change of professional culture in school and competitiveness at national and international levels.

In order to obtain qualified and competent vocational teachers in the global labor market, educational processes of vocational teacher candidates to be considered is the selection process for prospective teacher education, the process of prospective vocational teacher's education, and the evaluation process of prospective vocational teacher education. Further explanation is as follows.

- The process of selecting prospective teachers is to select candidate teachers for high requirements, both documents and portfolios. These are done to get prospective vocational teachers who are excellent in the future.
- The process of teacher candidates' education is carried out to provide knowledge, skills, and experience to prospective teachers. Knowledge and skills are related to the subject matter, pedagogic material, and psychological material. The experience of prospective teachers is formed from apprenticeship teaching in vocational schools for 6-12 months and industrial internships during 6 months.

The evaluation process of teacher vocational education is conducted to improve the quality of teacher education in accordance with the demands of the labor market at the national and international level. The evaluation needs to be done on the curriculum, competence of teachers, facilities, and management system. Evaluations need to involve graduate users, teachers' communities, and HRD associations from industries.

D. Updating Knowledge and Skills of Vocational Teachers

Becoming a professional vocational teacher is not easy. They have to update their knowledge and skills periodically. The aim is to prepare teachers according to the world's scientific and technological development needs in order to prepare competent and competitive vocational education graduates in national and global job markets.

The knowledge of vocational teachers consists of knowledge of learning materials and pedagogic knowledge. The learning materials are updated according to the knowledge requirements required by industries through industrial visits and internships. The pedagogic knowledge is updated according to the need to solve problems in the classroom and school. This can be done through further studies or attending trainings.

Meanwhile, the vocational teacher's skills are related to the competence of teaching practices. To ensure that teachers are competent to teach practice, the evaluation of skill competency tests needs to be conducted periodically, for example once every three years. If the teacher does not pass the skill competency test, then the teacher is not allowed to teach in the classroom. Skill competency tests are carried out by competency certification institution determined by government.

IV. CONCLUSION

Being a professional vocational teacher in the 21st century is not easy. Some things needed to be prepared by Indonesian government are policies and systems evaluated periodically in accordance with the demands of the global labor market development. This system is carried out between collaboration between government, universities, vocational high schools, industries, and teacher communities, and industrial HRD association.

Furthermore, three concepts to understand of 21st century vocational teachers in Indonesia regarding their responsibilities are foundations of vocational education, competency fields of vocational teachers, processes of vocational teacher candidates' education, and renewal of vocational teachers' knowledge and skills. The goal is that teachers will be aware of their responsibilities as vocational teachers to contribute toward the growth of the country's economy through the establishment of competitive and competent vocational education graduates in the global labor market.

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