

Vocational Education Development Framework in 21st Century

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Abstract—Vocational education that aims to prepare students to enter the workforce have to responsive and anticipatory to the demands of the world of work today and the future. Acceleration of science, technology and employment structure in national, regional and global context brings the consequences of the importance of 21st centuries skill mastery such as critical thinking & problem solving, creativity & innovation, communication, and collaboration. In addition to the mastery of expertise, important aspects of soft skills that need to be embedded include honesty, discipline, work ethic, responsibility, health, working in teams. Revitalization of vocational education in line with the demands of future qualifications, competencies, and human capital capabilities are keywords to do.

Keywords— *vocational education, competence, 21st-century skills*

I. INTRODUCTION

Vocational education includes vocational high school, has a central role in efforts to improve the quality of human resources in the global era. In the regional context, Asean Economic Community (AEC) agreed on Mutual Recognition Agreement (MRA) for various jobs and professions. Some areas of the profession that have had MRA until 2015 are: (1) engineers; (2) architect; (3) accountant; (4) land surveyors; (5) medical doctor; (6) dentist; (7) nurses, and (8) labor in tourism.

In an international context, vocational education continues to develop along with the advancement of science and technology that demands innovation and creativity so as to produce ready-to-use labor in the world of work. The 3rd UNESCO Congress on Technical and Vocational Education and Training (TVET) agreed that the vocational education sector would be a key factor in world economic growth. In addition, in the international context, vocational education continues to evolve into a scientific discipline.

In national policy context, the government's commitment to the development of vocational education is increasing. Presidential Instruction on the revitalization of Vocational High School (VHS) explicitly instructs of 12 ministries, National Professional Certification Bodies and Governors to take the necessary steps in accordance with their functions and authority to revitalize SMK to improve the quality and competitiveness of human resources. The regulation also instructed the preparation of the map of the need for employment for SMK graduates based on the roadmap for

SMK development. At the operational level, the five ministry agreements (Ministry of Industry; Ministry of Education and Culture; Ministry of Research, Technology and Higher Education; Ministry of Manpower; and Ministry of State-Owned Enterprises) are momentum to improve the quality of Vocational High School.

The vocational high school especially VHS is highlighted due to the problems surrounding it. The number of graduates of unemployed VHS is high. In 2016 there are 12,802 VHS in Indonesia (<http://datapokok.ditpsmk.net/>). Central Bureau of Statistics in August 2015 show that 12.65 percent of unemployed were from VHS. By 2016, the number of open unemployment is 7,024,172 people. Of these, 1,348,327 people (19%) were the last uneducated unemployed VHS (<http://bps.go.id/>).

Brojonegoro (Kompas, May 10, 2016) proposed the results of a survey conducted in 2015 of 460 companies spread across Sumatra, Java, Kalimantan and Sulawesi, with a variety of business fields and various sizes, indicating that the company is quite satisfied with VHS graduates who have they recruit even though the level of expertise has not been in accordance with the needs of the company. The survey shows that half the population of VHS graduates are not getting formal jobs, meaning that there is a discrepancy between the skills learned in VHS and the needs of the world of work. This needs to be the attention of policymakers for effective revitalization programs. Another thing that surfaced from the survey results is that companies prefer senior high school graduates rather than vocational graduates. Companies prefer those who are ready to train because of the dynamics of such a fast job in the era of global competition so that required candidates who are adaptive to follow the changing situation.

Various conditions as above indicate that the existence or role of VHS needs to be reviewed so that VHS aspirations can be realized. The total reform of vocational education needs to be done so that the existence of VHS is maintained through various efforts to make VHS remain the choice of the community (parents and students. One important step that needs to be done is the revitalization of vocational education. A holistic framework is needed in the development of vocational education.

II. NEW SKILLS IN 21st CENTURY AND VOCATIONAL EDUCATION REVITALIZATION

Around the world technical and vocational education and training (TVET) is widely seen as having a key role in promoting both economic and socio-economic growth, increasing productivity, empowering citizens and alleviating poverty (Lucas, 2014). Increasingly, countries are recognising that good initial vocational education and training has a major contribution to make to economic competitiveness (OECD, 2010). It has become widely recognized that TVET provision is an important, even growing, part of national education systems and any skills development agenda. At the same time, the capacity of the TVET sector to adequately prepare skilled workers through the provision of relevant skills development programmes of high-quality depends largely on the quality of its teachers and trainers, and, by extension, the quality of its teacher training programmes (Axmann, Rhoades and Nordstrum, 2015).

Vocational education is an education that aims to prepare graduates to enter the world of work. Clarke and Winch (2007: 9) say that vocational education is confined to preparing young people and adults for working life. Gunderson (2004: 3) states that Vocational Education includes courses and programs at various educational levels for selected careers in an occupational area While Billet (2011: 2) states vocational education as education for occupation.

In the international context, vocational education is commonly referred to as Technical and Vocational Education and Training (TVET). TVET is concerned with the acquisition of knowledge and skills for the world of work (Gough, 2010: 1). Vocational education involves preparing people for the world of work, that is, preparing them to "make a living" by the nearby and distant societies (Thomas, 2005: 626). In line with that, Rauner (2009: 1451) states that Vocational education differs from all other types of institutionalized education at schools and universities in that learning about the process is an indispensable part of professional competence development ". While Pavlova (2009: 7) suggests:

“Traditionally, direct preparation for work was the main goal of vocational education. It was perceived as providing specific training that was reproductive and based on teachers’ instruction, with the intention to develop an understanding of a particular industry, comprising the specific skills or tricks of the trade. Students’ motivation was seen to be engendered by the economic benefits to them, in the future. Competency-based training was chosen by most governments in Western societies as a model for vocational education”.

Based on this statement it is clear that vocational education focuses on efforts to prepare graduates in accordance with the demands of the world of work. The consequences vocational education have to adaptive to the changing world of work. Various conditions indicate the importance of the revitalization of vocational education, especially changes in the characteristics of labor needed in the future.

1. Changes in the characteristics of future employment require human resources that have an open competitiveness with other countries, adaptive and anticipatory to new changes and conditions, open to change, able to learn how to learn, multi-skilling, easy retrained, and has broad, strong, and fundamental basics to develop in the future (Sukamto, 2001).
2. Kay (2008) identifies what competencies are needed in the 21st century and concludes that educational institutions should prepare students with the ability to: (1) global awareness, (2) the character of independence, (3) the ability to cooperate globally, (4) ITC, (5) technological literacy, (6) intellectual ability emphasized on critical thinking and problem-solving skills, (7) ability to innovate & improve, and, (8) have flexible and adaptable knowledge and skills.
3. Wagiran (2008) shows that the top ten skills expected by the industry include aspects of honesty, work ethic, responsibility, discipline, applying safety principles, initiative and creativity, cooperation, adjustment, self-confidence, and tolerance. Soft skills have a significant role in determining the success of a business/industry and the success of the employees.
4. Wagner (2008), The Global Achievement Gap is the gap between what even our best schools are teaching and testing Versus The skills all students will need for careers, college, and citizenship in the 21st century. There are Seven Survival Skills for Careers, College, And Citizenship:
 - a. Critical Thinking and Problem-Solving
 - b. Collaboration Across Networks and Leading by Influence
 - c. Agility and Adaptability
 - d. Initiative and Entrepreneurialism
 - e. Effective Oral and Written Communication
 - f. Accessing and Analyzing Information
 - g. Curiosity and Imagination
5. In the 21st century, those entering the labour market need immediate job skills, but they also need a range of career and cognitive competencies that will enable them to handle changing jobs and career contexts and to sustain their learning capacity, bearing in mind that technological advance has increased the demand for higher level technical skills, including the demand for vocational tertiary education (OECD, 2010).
6. Lucas, Ellen, and Claxton (2012) published its Skills Strategy. Although broader in scope than our review, the OECD suggests that if vocational education and training are to serve the needs of the 21st century, then:
 - a. Knowledge needs to be more relevant, and a better balance struck between the conceptual and practical, suggesting a particular role for programmes incorporating on-the-job training such as apprenticeships;
 - b. Higher order skills, such as the ‘Four Cs’ of creativity, critical thinking, communication and collaboration, are essential for absorbing knowledge;

- c. Character traits, both performance-related (adaptability, persistence, resilience) and moral (integrity, justice, empathy and ethics) need to be shaped both at school in the workplace to help individuals to be active and responsible citizens; and
 - d. Meta-layer skills, such as learning to learn, building expertise, fostering creativity and making connections across disciplines, are becoming more important in a world of growing complexity⁹.
7. In this 21st century where technology is fast changing and expectation from industry is high, TVET graduates must be prepared with the appropriate knowledge, skills, and attitude to enter labor market (Paryono, 2016).
 8. Today, we are at the beginning of a Fourth Industrial Revolution. Developments in genetics, artificial intelligence, robotics, nanotechnology, 3D printing and biotechnology, to name just a few, are all building on and amplifying one another. To prevent a worst-case scenario—technological change accompanied by talent shortages, mass unemployment and growing inequality—reskilling and upskilling of today’s workers will be critical. The accelerating pace of technological, demographic and socio-economic disruption is transforming industries and business models, changing the skills that employers need and shortening the shelf-life of employees’ existing skill sets in the process (World Economic Forum, 2016).

From the above description, it is clear that revitalization of vocational education is very important. Through revitalization, it is expected that vocational education is really capable of producing graduates who have the competence and capacity to enter the world of work. Therefore, a holistic framework is needed in the development of vocational education in the future.

III. FRAMEWORK FOR THE DEVELOPMENT OF VOCATIONAL EDUCATION 21ST CENTURY

The development and changes in the world of work as a result of the development of science and technology as well as changes in local, national, regional and global conditions bring about changes to the demands of human resources needed. The competencies currently formulated are inadequate, therefore in an era of rapid change, new competencies are needed, especially in preparing the generation of 21st century.

TVET as education that prepares its students to enter the world of work, it is a time in terms of concept, philosophy, and policy aligned with local, national, regional, and global demands. Technology and vocational education are also required to formulate the concept of vocational learning as a result of the development of the situation. The demands and changes in the local, national, regional, and global context of employment and the context of 21st-century skills bring the consequences of the need for vocational learning formulas in harmony with the characteristics of 21st-century skills.

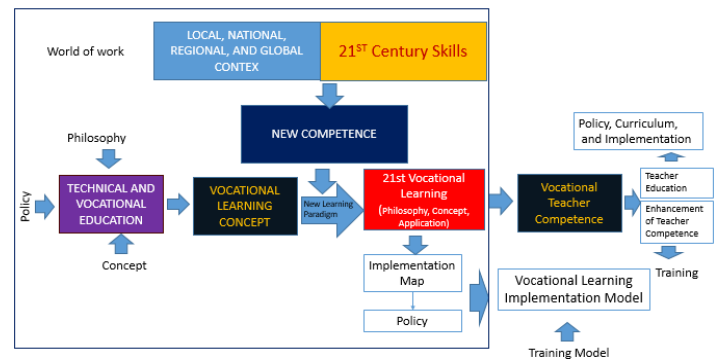


Figure 1. Vocational Education Revitalization Framework

Implementation map of learning within the scope of vocational education is needed in order to get a description of current conditions and learning gaps compared to the demands of learning of the 21st century. Based on the analysis of these conditions can be formulated a policy of vocational learning model and implementation tools.

Learning development of 21st century cannot be separated from the teacher aspect. Therefore, an important step is to formulate the competencies of future vocational teachers. This study will provide further impacts in the formulation of concepts, policies, and lessons learned in the preparation and development of vocational teachers. Equally important is the formulation of learning for prospective vocational teachers who are preceded by a study of competency profiles of current vocational teachers.

IV. CONCLUSION

The acceleration of the development of labor structures in the global era brings the consequences of educational cycles to be adaptive and anticipatory. Vocational education is required to prepare its graduates to be ready to enter the world of work of the future. Revitalization of vocational education is a strategic step in efforts to prepare human resources in the 21st century

REFERENCES

- [1] ASEAN. *ASEAN Economic Community Blueprint*. Jakarta: ASEAN Secretariat, 2008.
- [2] Axmann, M., Rhoades, A., and Nordstrum, L. *Vocational Teachers and Trainers in a Changing World: The Imperative of High-quality Teacher Training Systems*. Geneva: ILO, 2015.
- [3] Badan Pusat Statistik. *Pengangguran Terbuka Menurut Pendidikan Tertinggi yang Ditamatkan, 2004-2014*. Diambil pada tanggal 19 Mei 2015 dari <http://bps.go.id/linkTabelStatis/view/id/972>, 2014.
- [4] Billet.S. *Vocational Education Purposes, Traditions and Prospects*. London: Springer Science+Business Media, 2011.

- [5] Brodjonegoro,S.S. Revitalisasi Pendidikan Kejuruan. Kompas, 10 Mei 2016.
- [6] Clarke, L & Winch, C. Vocational Education: International Approacher, Development, and System. New York: 270 Madesun Avenue, 2007
- [7] Direktorat Pembinaan SMK. (2016). Data Pokok SMK. <http://datapokok.ditpsmk.net/>.
- [8] Gough, S. Technical and Vocational Education and Learning: An Investment-based Approach. Great Britain: the MPG Books Group, Bodmin and King's Lynn, 2010.
- [9] Gunderson, M. M. A Study of The Influence Vocational Education has on Students' Ultimate Academic Success. (Disertasi doktor, University of Central Florida, 2004). ProQuest Information and Learning Company, UMI Number: 3162094, 2004
- [10] Instruksi Presiden (Inpres) Nomor 9 Tahun 2016 tentang Revitalisasi Sekolah Menengah Kejuruan (SMK) dalam rangka Peningkatan Kualitas dan Daya Saing Sumber Daya Manusia (SDM) Indonesia.
- [11] Kay, K. "Preparing Every Child for the 21st Century". APEC EdNet – Xi'an Symposium Xi'an China, January 17., 2008.
- [12] Lucas, B. Vocational Pedagogy. Germany: UNESCO-UNEVOC, 2014
- [13] Lucas, B., Spencer, E., Claxton, G. How to teach vocational education: A theory of vocational pedagogy. City and Guides Centre for Skills Development, 2012.
- [14] OECD. Learning for Jobs. Synthesis Report of the OECD Reviews of Vocational Education and Training, 2010.
- [15] Paryono. Integration of 21st Century Skills in TVET Institution in Selected ASEAN Member States: Current Status and Way Forward. The SEAMEO VOCKETH International Conference on Ensuring Greater Impact of TVET for Sustainable Development, Brunei: 1-2 June 2016.
- [16] Pavlova, M. (2009).Technology and Vocational Education for Sustainable Development Empowering Individuals for the Future. Queensland: Springer, 2009.
- [17] Rauner, F. Overview: TVET Research. International Handbook of Education for the Changing World of Work (pp.1443-1460). Germany: Springer Science+Business Media B.V.
- [18] Sukamto. Perubahan Karakteristik Dunia Kerja dan Revitalisasi Pembelajaran dalam Kurikulum Pendidikan Kejuruan. Yogyakarta: Yogyakarta State University, 2001.
- [19] Thomas, R.M. Education from an International Perspective. Encyclopedia of Education and Human Development (pp.611-648). New York: M.E. Sharpe, Inc, 2005.
- [20] Wagiran. The Importance of Developing Soft Skills in Preparing Vocational High School Graduates. International Conference on VTE Research and Networking 2008: Nurturing Local VTE Research Efforts: A Response to Global Challenges 7 – 8 July 2008 Inna Grand Bali Beach Hotel, Bali, Indonesia.
- [21] Wagner, T. The Global Achievement Gap: Why Even Our Best Schools Don't Teach The New Survival Skills Our Children Need—And What We Can Do About It. USA: Basic Books, 2008.
- [22] World Economic Forum. The Future of Jobs Employment, Skills and Workforce Strategy for the Fourth Industrial Revolution, 2016