

# The Challenges of Vocational Education in Indonesia

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**Abstract-** This paper examines the various challenges of vocational education in Indonesia in the era of the Industrial revolution. The result of this research is that the challenges of vocational education in Indonesia consist of internal and external factors. Internal factors include government policy factors for vocational education, link and match factors between the academic world and the business world and industry, human resource factors, life skills factors possessed. External factors can be indicated by the increasingly rapid development of the industry which causes a higher level of adaptation difficulty. The conclusion of this paper is that vocational education is experiencing increasingly severe challenges so that it requires commitment and cooperation as well as a level of resources that is able to answer every challenge of life in the future.

**Index Terms-** vocational education; Internal factors; external factors

## I. INTRODUCTION

Since the term industry revolution 4.0 emerged, accompanied by various phenomena. Industry 4.0 is characterized by an increase in digitalization of manufacturing driven by four factors: 1) an increase in data volume, computational power, and connectivity; 2) the emergence of analysis, capabilities, and business intelligence; 3) the occurrence of new forms of interaction between humans and machines; and 4) improvement of digital transfer instructions to the physical world, such as robotics and 3D printing (Lee, et.al. 2013). The machine will operate independently or coordinate with humans (Sung; 2017) in other words, the mechanism of work is more oriented to the machine compared to human power.

Industry 4.0 is an approach to control the production process by synchronizing time by integrating and adjusting production [Kohler; 2017]. Industry 4.0 was used on three interrelated factors namely; 1) digitization and interaction of economics with simple techniques towards economic networks with complex techniques; 2) digitalization of products and services; and 3) new market models. One of the unique characteristics of Industry 4.0 is the application of artificial intelligence [Tjandrawina; 2016]. One form of application is the use of robots to replace human labor so that they are cheaper, more effective and efficient. Technological advancements make automation possible in almost all fields. New technologies and approaches that combine the physical, digital and biological world will fundamentally change the patterns of life and human interaction.

Wolter identified the challenges of industry 4.0 as follows; 1) information technology security issues; 2) the reliability and stability of the production machine; 3) lack of adequate skills; 4) unwillingness to change by stakeholders; and 5) the loss of a lot of work because it turns into automation. He simplifies industry 4.0 challenges namely; (1) industry readiness; (2) trusted workforce; (3) ease of socio-cultural regulation; and (4) diversification and job creation and industry opportunities 4.0 namely; (1) ecosystem innovation; (2) competitive industrial base; (3) investment in technology; and (4) integration of Small and Medium Enterprises (SMEs) and entrepreneurship [Irianto; 2017].

The challenges and opportunities of the industrial revolution 4.0 drive the acceleration of innovation and the creation of vocational education. Makalah ini mengkaji tentang faktor internal dan faktor eksternal tantangan pendidikan vokasi di Indonesia.

## II. RESEARCH METHOD

This study uses a literature review, focusing on the challenges in vocational schools on changes in industrialization in the 4.0 era. The data used in this research is secondary data. Secondary data is data obtained from the results of research that has been done by previous researchers. The secondary data sources referred to are primary and original books and scientific reports contained in articles or journals (printed and / or non-printed). The data used is related to the theme, skills in the 21st century. Data analysis uses annotated bibliography. Research procedures with the organization of articles from journals and books, which are relevant to the theme, synthesize the findings of the article, identify ideas that are considered important, and formulate data that is used as the essence of research.

## III. RESULT

### Government Policy on Vocational education

As a government program related to increasing the competence of vocational education graduation delivered by the Minister of Industry, that there are 4 important points in the effort to increase this, including competency-based vocational education using a dual system or dual system which is held in all education units owned by the Ministry of Industry, namely 9 SMK, 10 Polytechnics, and 2 Community Academies; second, he continued, namely the construction of an Industrial Polytechnic or Community Academy in an Industrial Estate or Industrial Growth Center Area. This aims to encourage increased investment and empowerment of local human resources; third is industrial

vocational education which links and matches between SMK and Industry. So the launch of the industrial vocational education program will be followed up with programs to strengthen the capacity and quality of SMK through curriculum alignment, as well as facilitation of student work practices in the industry as well as practical support facilities for SMKs; the fourth is to organize a competency-based industrial training program with a 3 in 1 system of training, certification and job placement.

#### IV. POLICIES ON IMPROVING THE COMPETENCE OF TEACHERS AND LECTURERS

Mulyasa (2007: 24) states that competence is the ability to carry out tasks obtained through education and training. Republic of Indonesia Law number 20 of 2005 on Teachers and Lecturers explains that competence is a set of knowledge, skills and behaviors that teachers and lecturers must possess, live and master in carrying out professional duties. Government regulation number 19/2005 concerning national education standards article 28 paragraph 3 teacher competence includes personality competence, pedagogical competence, professional competence and social competence which is obtained through professional education. According to Government Regulation Number 74 of 2008, that the education component or teacher has at least pedagogic competence, which includes pedagogic competence as referred to in paragraph (2) is the ability of the teacher in managing student learning which at least includes: (a) understanding of insight or foundation education; (b) understanding of students; (c) curriculum or syllabus development; (d) instructional design; (e) the implementation of educational and dialogical learning; (f) utilization of learning technology; (g) evaluation of learning outcomes; and (h) the development of students to actualize their various potentials. Personality competence as referred to in paragraph (2) shall at least include a personality that is: faithful and pious; noble character; wise and prudent; democratic; great; authoritative; stable; adult; honest; sportsmanship; be a role model for students and society; objectively evaluate own performance; and develop themselves independently and sustainably. Social competence as referred to in paragraph (2) is the ability of the Teacher as part of the Community which at least includes the competence to: communicate verbally, in writing, and / or politely; use communication and information technology functionally; associating effectively with students, fellow educators, educational staff, leaders of educational units, parents or guardians of students; socializing politely with the surrounding community by observing the prevailing norms and value systems; and apply the principle of true brotherhood and a spirit of togetherness, while professional competence includes; mastering material, structure, concepts, and scientific thought patterns that support the subjects being taught; master the competency standards and basic competences of the subjects being handled; develop creative learning materials (Irwanto, 2019).

The teacher competencies are: (1) Competency exists in a real-life setting, (2) Competency follows a progression from simple to complex, (3) Competency is based on a set of resources, (4) Competency is based on the ability to mobilize resources in situations requiring professional action, (5) Competency is part of intentional practice, (6) Competency is demonstrated as a successful, effective, efficient, recurrent performance, (7)

Competency is a project, an ongoing pursuit. Therefore, based on The World Economic Forum warns structural changes in skills in the 21st century. In 2015, the structure of skills needed by the workforce is as follows; 1) complex problem solving; 2) cooperation with others; 3) people management; 4) critical thinking; 5) negotiation; 6) quality control; 7) service orientation; 8) assessment and decision making; 9) active listening ; and 10); creativity. In 2020 the work structure changes to; 1) complex problem solving; 2) critical thinking; 3) creativity; 4) people management; 5) cooperation with others 6) emotional intelligence; 7) assessment and decision making; 8) service orientation; 9) negotiation; and 10) cognitive flexibility.

#### V. ADJUSTMENT OF VOCATIONAL EDUCATION (SMK) TO THE INDUSTRIAL REVOLUTION 4.0

21st century learning is oriented towards digital lifestyle, thinking tools, learning research and the workings of knowledge, therefore, vocational education requires a high level of literacy (C. Trilling, B & Fadel; 2009). The theme of information literacy is (1) determining the nature and level of information needs needed, (2) accessing the information needed, (3) using information effectively and efficiently, (4) using ethical and legal information (Çoklar, N. D. Yaman, 2017), and (5) critically evaluate information and sources and incorporate selected information into pre-existing knowledge and value systems (G. Shao, X., & Purpur, 2016); (1) identify sources of information; (2) identify types of information; (3) choosing how to access information through the internet; (4) rediscovering information online; (5) establish criteria for assessing information from the internet; (6) establish criteria for assessing information from books; (7) uses new information to plan and create results; (8) communicating results or performance in writing; (9) understand various ethical, legal and socio-economic issues around information and information technology; and (10) recognizing the use of information sources used (Ibda, 2013).

Based on Permendikbud (regulation) No. 23 of 2017 concerning School Days, there are several things that are strengthened from the 2013 Curriculum results of the 2017 revision, namely (1) strengthening of character education, (2) mastery of literacy, and (3) strengthening of high order thinking or high order thinking skills. While the character is focused on aspects of religiosity, nationalism, independence, mutual cooperation and integrity. In literacy mastery is emphasized in the 21st century literacy that is summarized in 4C, namely (1) creative, (2) critical thinking, (3) communicative and (4) collaborative. These 4C aspects include some high-level thinking competencies (Hasan Subekti, 2018).

Thus, learning in the 4.0 era focuses on the formation of IT-based digital lifestyles, the ability and innovation of learning, and the development of life skills, and more specifically, learning undertaken by teachers must be oriented towards developing four core skills: critical thinking skills and problem solving , communication skills, collaboration skills, and the ability to create new things (creativity), (C. Trilling, B & Fadel; 2009). Revitalizing the learning system includes, 1) curriculum and character education, 2) learning materials based on information and communication technology, 3) entrepreneurship, 4) alignment, and 5) evaluation. Education units include, 1) new

school units and new classrooms, 2) other learning rooms, 3) classroom rehabilitation, 4) student and teacher dormitories, 5) equipment, and 6) school management and culture. Elements of students include, 1) scholarships and 2) talent development of interest. Elements of educators and education personnel include, 1) provision, 2) distribution, 3) qualifications, 4) certification, 5) training, 6) career and welfare, and 7) appreciation and protection. The number of unemployed SMK graduates had made the government take a policy to revitalize vocational education. There are four points that become the focus of revitalization of SMK which is mandated in Presidential Instruction no. 9 of 2016. These four points include curriculum revitalization, educators & education personnel, cooperation, and graduates. (1). Curriculum; The curriculum is currently rigidly assessed. As a result, it is difficult to meet the needs of the workforce that is ready for business and industry. (2). Educators & labor; In addition to availability, revitalization is also aimed at improving teacher competence (Yoto, 2015).

## VI. CONCLUSION

Vocational education has a heavier challenge in the era of the increasingly fast industrial revolution. Therefore, the concept of cooperation and sustainability between policy and implementation is needed, with the aim that vocational education graduates are able to adapt to the environment and be able to survive in the present and future.

## REFERENCES

- [1] Lee, J., Lapira, E., Bagheri, B., Kao, H., "Recent Advances and Trends in Predictive Manufacturing Systems in Big Data Environment.," *Manuf. Lett.*, vol. 1, no. 1, pp. 38–41, 2013.
- [2] T. K. Sung, "Industri 4.0: a Korea perspective.," *Technol. Forecast. Soc. Chang. J.*, pp. 1–6, 2017.

- [3] J. . Kohler, D. & Weisz, *Industry 4.0: the challenges of the transforming manufacturing*. Germany: BPIFrance, 2016.
- [4] R. . Tjandrawina, "Industri 4.0: Revolusi industri abad ini dan pengaruhnya pada bidang kesehatan dan bioteknologi," *J. Med.*, vol. 29, no. 1, 2016.
- [5] D. Irianto, "Industry 4.0; The Challenges of Tomorrow," in *Seminar Nasional Teknik Industri*, Batu-Malang, 2017.
- [6] C. Trilling, B & Fadel, *21st-century skills: learning for life in our times*. US: Jossey-Bass A Wiley Imprint., 2009.
- [7] I. K. Y. A. N. Çoklar, N. D. Yaman, "Information literacy and digital nativity as determinants of online information search strategies," *Comput. Hum. Behav.*, 2017.
- [8] G. Shao, X., & Purpur, "Effects of Information Literacy Skills on Student Writing and Course Performance," *J. Acad. Librariansh.*, vol. 42, no. 6, pp. 670–678, 2016.
- [9] I. H. S. Hasan Subekti, Mohammad Taufiq, Herawati Susilo, "Mengembangkan Literasi Informasi Melalui Belajar Berbasis Kehidupan Terintegrasi Stem Untuk Menyiapkan Calon Guru Sains Dalam Menghadapi Era Revolusi Industri 4.0: Reviueu Literatur," *Educ. Hum. Dev. J.*, vol. 3, no. 1, 2018.
- [10] H. Ilda, "Urgensi Pemertahanan Bahasa Ibu di Sekolah Dasar," *J. SHAIH*, vol. 2, no. 2, 2017.
- [11] Yoto, "Pengembangan Pendidikan Kejuruan Melalui Pendidikan dan Pelatihan Bidang teknik Mesin Bagi Guru SMK," *J. Tek. Mesin*, vol. 23, no. 1, 2015.
- [12] Irwanto. 2019. *Kompetensi Guru Vokasional SMK Di Era Revolusi Industri 4.0*. Prosiding Seminar Nasional Pendidikan FKIP Universitas Sultan Ageng Tirtayasa Vol. 2, No.1, 2019, hal. 182-204

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