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Review of Vocational Education Curriculum in the Fourth Industrial Revolution and Contribution to Rural Development

[1]Misbachul Munir, [1]Ella Anastasya Sinambela, [1]Siti Nur Halizah, [2]Rafadi Khan Khayru, [3]Vatosoa Mendrika

[1]*Sunan Giri University, Indonesia*
[2]*Airlangga University, Indonesia*
[3]*Université d'Antsiranana - Madagascar*

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A B S T R A C T

The industrial revolution 4.0 is an opportunity as well as a threat for all sectors. The era of the The industrial revolution 4.0 is an opportunity as well as a threat for all sectors. The era of the industrial revolution 4.0 changed the concept of work, work structure, and competencies needed by the world of work. The changes made are not only in the way of teaching, but are far more essential, namely changes in the perspective on the concept of education itself, one of which is vocational education. This study aims to determine the application of the vocational curriculum to be able to compete in the Industrial Revolution 4.0 Era. The method used in writing this article is the literature analysis method. The results show that in this new paradigm, the teacher's role remains strategic as a designer and implementer of learning, more as a facilitator and motivator so that students are active in an effective and optimal learning process. Curriculum preparation requires opinions from several parties such as academia, government and industry. curriculum adjustments, can be rebranded through direct studies to see the needs of human resources in the industry or through comparative studies to more advanced educational institutions both at home and abroad. In addition, vocational education is also expected to be implemented by building villages. Vocational graduates are expected to be able to provide innovative solutions to solve problems that exist in the village. Vocational education support to develop villages requires cooperation from various parties.

INTRODUCTION

The vocational curriculum is a curriculum that is structured so that students are ready to work after graduating from their education. Thus, every educator who teaches at the vocational education level needs to update the competencies they have every time there is a change. Vocational education has developed very rapidly in the last decade. This is because the government focuses on the growth of the education sector component as a key strategy for economic growth.

Vocational education was at a time when its position was underestimated. Vocational education institutions need to anticipate vocational graduates who after graduation do not have jobs. This causes vocational education is often forgotten and received less attention. Whereas vocational education graduates have adequate skills in certain fields. Meanwhile, students hope that by completing their studies in vocational education, it will be easier to get a job because they are considered to have special skills or expertise needed by the world of work. Thus, vocational education must be able to follow the development of the business world and industry. This can be a selling point for graduates. With support from the industrial sector, vocational education graduates can become skilled workers who are ready to enter the industry according to their expertise. This hope has not been fully realized effectively.

For this reason, the vocational curriculum is prepared to be in accordance with work needs. The need for work that is always dynamic will have an impact on frequent changes to the vocational curriculum. The relevance of the curriculum to work demands is still a problem. People still think that the quality of vocational education is still low. With the high unemployment rate for vocational graduates, people think that vocational graduates are graduates who do not have competence. Whereas vocational graduates are educated to be ready to work after graduating from education. This competition is getting clearer during the era of the industrial revolution 4.0. Industry 4.0 is a trend in today's industrial world that combines automation technology with cyber technology. This era is leading to the application of the concept of automation by machines without the need for human labor in its application. New innovations Internet of Things (IoT), Big Data, 3D printing, Artificial Intelligence (AI), driverless vehicles, genetic engineering, robots and smart machines are believed to completely change the industrial world, far more sophisticated than the 3.0 industrial revolution.

Vocational education is also expected to increase students' interest in building the area where they live.

** Corresponding author, email address:* ***rafadi.khankhayru@gmail.com***

Especially for students who come from villages. Not many villages can develop the potential that exists in their village. There are still many students from rural areas who choose to leave their hometowns and work in cities. Village potential can be developed with skills learned in vocational education. Sources of problems and alternative solutions are more accurately identified when they are formulated by the village community itself. Therefore, vocational education providers can contribute to developing skills to carry out rural development.

THE FOURTH INDUSTRIAL REVOLUTION

The Industrial Revolution 4.0 has fundamentally changed the way people think, live, and relate to one another. In the era of the industrial revolution 4.0, technology (especially automation and the internet) is said to be the primadonna that has the biggest influence. This era will disrupt various human activities in various fields, not only in the field of technology, but also in other fields such as economics, social and politics. Social interaction becomes unlimited, because of the ease of access to the internet and technology.

Industrial Revolution 4.0 has various negative impacts, such as the threat of unemployment due to automation. Therefore, the key in facing the Industrial Revolution 4.0 is in addition to preparing technological advances, on the other hand it is necessary to develop human resources from the humanities side so that the negative impacts of technological developments can be suppressed. The role of technology in the era of the industrial revolution 4.0 took over almost most of the economic activity. In addition to driving economic growth, this trend has changed many areas of human life, including the world of work and even the lifestyle of humans themselves. Basically, the industrial revolution 4.0 combines machines, workflows and systems with intelligent network deployment throughout the process. The industrial revolution 4.0 is able to eliminate a number of types of work, but on the other hand it also presents new types of work.

The impact of the industrial revolution 4.0 era has brought major changes to human life. One of them is marked by the emergence of many jobs that shift human labor. This condition requires human creativity to create jobs that did not exist before. The industrial revolution 4.0 can cause symptoms or symptoms that make humans only feel amazed and become a market share for the industrial revolution 4.0. Every change must have readiness rather than being left behind and crushed by the industrial revolution.

Behind the convenience created by the industrial revolution 4.0, it still causes criticism from some scientists, it's just that it is not highlighted in the issue of the industrial revolution 4.0. There are three aspects that are still critical in the industrial revolution 4.0. The first aspect is profit, for some companies the use of technology does not generate profits commensurate with the purchase of technology that drains funds. This may be due to the stuttering aspect of technology.

The next aspect is planets. This aspect still rarely crosses the human mind that technology also has a bad impact on the environment. For example, technology that makes it easy to mass produce goods, this will have a common thread in the increasing distribution activity using land, air, and sea vehicles. Meanwhile, vehicle fumes have a very bad impact on the environment.

Then the last aspect is people. If you can think again, the ease of automatic technology should make people have more free time for themselves and for their families. But in practice, a life filled with technology actually eliminates real interactions in real social life because almost all of them are based on high technology content.

The industrial revolution actually always happens from year to year. Starting when humans still use various manual tools to meet their needs. The development of the industrial revolution has always been the answer to every human need. In other words, humans are the subject of the industrial revolution. Therefore, it is necessary to know what people will need in the future, so that they can become actors in the next industrial revolution, not just victims.

A person must be able to have the abilities of the previous industrial revolution, namely working according to standards, being able to do many things, analytical skills, and having intelligence. With these four abilities, then one can be said to be ready for the industrial revolution 4.0. When it comes to the industrial revolution 4.0, don't forget about human capabilities in the previous industrial revolution.

EDUCATION AND WORK SKILLS

All skills to deal with the world of work have been considered as determinants in the era of the industrial revolution 4.0 such as adaptability, critical and innovative entrepreneurial mindset, accountability, driven by goals and enthusiasm and other skills considered relevant to be employed and ready to work. The industrial revolution 4.0 is an opportunity as well as a threat for all sectors (Wolf, 2018). The changes made are not only in the way of teaching, but are far more essential, namely changes in the perspective on the concept of education itself, one of which is vocational education. The era of the industrial revolution 4.0 is a stage of a period that comes with a wave called disruption, which is a condition where changes that occur in the industrial world take place very quickly, fundamentally, and even seem to stir up old patterns to produce a new order. In higher education, digital learning is a form of educational disruption that has the ability to fundamentally change the learning process (Buasuwan, 2018).

The world of education is required to keep up with rapidly developing technological developments and utilize information and communication technology as more and more sophisticated facilities to facilitate the learning process (Andayani, 2004). The skills needed by the world of work must be answered through an educational process that evolves practically and quickly. This requires the use of information and communication technology; the learning mindset can shift from teacher centered to student centered. Responding to the needs of the industrial revolution 4.0 where humans and technology are aligned to create new opportunities creatively and innovatively. Therefore, it is necessary to form quality human resources who are creative and in accordance with current demands where the world is facing a digital-based industrial revolution.

VOCATIONAL EDUCATION AND READINESS

The curriculum is structured to make it easier for teachers to plan when providing educational materials. For vocational education, the curriculum that is prepared must always be in accordance with the conditions of the world of work. Skills that match job requirements will create more value for vocational graduates. Companies will prefer vocational graduates who have the skills and abilities in accordance with the jobs offered so that there is no need to spend on training costs.

In the preparation of vocational education curricula, vocational education institutions require experts from various parties related to graduates such as academics, entrepreneurs, or company managers. This needs to be done to equalize the perception of the company's work needs. By presenting these parties, the teaching and training carried out at vocational education institutions will be in accordance with the attributes of work interests.

The era of digitalization makes the vocational curriculum provide more practice than theory. With the use of technology, students can find information about learning obtained through the internet. Vocational learning is more emphasized on software work with related learning (Hang *et al*., 2018). Educators in the Industrial Revolution 4.0 era must be able to respond to changes, act as student companions, train them to become independent learners, develop skills in managing student data, and provide career guidance by utilizing big data available as public information or from other relevant sources. For this reason, educational institutions need to prepare themselves to be able to provide the right curriculum for students.

Curriculum development can be carried out using various approaches that can be chosen, involving various stakeholders, paying attention to the foundation of curriculum development such as philosophical, psychological, social, and science and technology factors (Finch & Crunkilton, 1984). In curriculum development, many parties must participate, namely education administrators, education experts, curriculum experts, experts in the field of science, teachers, parents of students, community leaders. Meanwhile, those who are continuously involved in curriculum development include administrators, teachers, and parents.

Vocational education requires training which is the practice of the education received in the classroom. This activity needs to be done to improve students' skills towards their technological abilities. Adebayo (2018) explains that the development of the vocational curriculum also requires good facilities such as books, computers, or other practical tools. Gentili (2007) explains that this vocational practice activity needs support from the teacher. Teachers need to improve their abilities not only in theory but also how to apply them in practice. Teachers also need to improve their technology application skills. Teacher assistance to students when learning in class or practice will make students have high competence, this is an advantage that can be obtained by vocational graduates to be able to compete in the world of work. All parties who need progress in vocational graduates must be able to plan and implement strategies to be able to compete in the era of the industrial revolution 4.0. Educators in the Industrial Revolution 4.0 era must be able to respond to changes, act as companions for students, train them to become independent learners, develop skills in managing student data, and provide career guidance using big data available as public information or from other relevant sources.

Reform and reconstruction of the curriculum to adapt to the era of the industrial revolution 4.0 is carried out by taking into account the following two things. First, the curriculum equips students with the knowledge and skills to develop and use new things such as coding, big data, and artificial intelligence. Second, the curriculum includes the use of new formats for the learning process, for example blended learning, fully online, and fully e-learning. Vocational education institutions do not need to create new majors, but integrate the learning context of the XXI century where the curriculum contains dual competencies, which include: (1) Critical thinking, problem solving, collaboration, and creativity and innovation, (2) Digital literacy skills include information literacy, media literacy, and ICT literacy, and (3) Career and life skills include flexibility and adaptation, initiative, social and cultural interaction, productivity and accountability, leadership and responsibility (Trilling & Fadel, 2009).

VOCATIONAL AND RURAL DEVELOPMENT

Quality vocational education will be ready with the industrial revolution 4.0. This industrial revolution can not only be felt by urban communities but also by rural communities. Urbanization still has the impact of lagging independent rural development. This needs to emphasize efforts to develop village potential through vocational education graduates who come from the village itself.

Vocational education provides knowledge and skills to be able to develop the potential that exists in the village. Vocational education graduates have more innovative ways to develop Village-owned enterprises. Vocational graduates, especially those from their own villages, are expected to be able to provide innovations to solve problems that exist in their homes and are monitored based on daily life. Sources of problems and alternative solutions are more accurately identified when they are formulated by the village community themselves. So far, several villages have not been able to fully enjoy the results of Village-owned enterprises, both in terms of results and for the development of their own businesses. The skills taught in vocational education can improve the processing system in Village-owned enterprises so that it can provide more benefits for the welfare of rural communities.

Vocational education can be applied in various villages with the aim of developing villages. The selection of vocational education must be adjusted to the potential that exists in the village. Various programs can be implemented such as the Entrepreneurial Skills Program and the Job Skills Program.

With changes in the vocational curriculum that can be applied in villages, rural development can be felt quickly. Vocational graduates are able to provide ideas that play a role in accelerating the development of human resources, including in rural communities. Therefore, vocational education is directed to be able to produce graduates who are skilled, competent, competitive, and have character in accordance with the needs of the business world and industry. This requires support from various parties such as

relevant agencies and the community. Higher education is one of the contributors that can give birth to superior human resources who are competent, innovative, creative, and able to compete globally, so that vocational education can be an answer to the challenges of the times to develop community potential. With the ready-to-work skills provided in vocational education, it can also be applied in the village by looking at the potential that exists in the village. The development of village potential can help the community to develop the economy. This of course will have a direct impact on the welfare of the community itself. The wider impact will improve the country's economy.

The existence of vocational education will be able to maximize its role in student development and economic development in full by paying attention to the following three efforts: (1) the knowledge taught to students must be appropriate to facilitate the development of students to become complete human beings in accordance with the characteristics of the Indonesian nation and must be in harmony with the needs of the community, especially the world of work; (2) strengthening students' soft skills through various means, especially the quality of intrapersonal and interpersonal skills; and (3) teach entrepreneurship to vocational education students through knowledge, awareness, and real practice about entrepreneurship.

CONCLUSION

The industrial revolution 4.0 has an impact on every aspect that exists. Especially in vocational education institutions as creators of human resources who are ready to work. To prepare quality graduates, it is necessary to apply an appropriate curriculum. With the demands of the dynamic world of work, educational institutions must implement an appropriate curriculum. Changes to the vocational curriculum can also be developed to support rural development. Vocational skills are carried out to provide benefits for students, provide jobs, and the country with equitable development.

The application of a curriculum that is in accordance with the wishes of job seekers will be the capital for graduates to get jobs that match their education. The vocational education curriculum is required to always adapt to changing conditions, technology, and the demands of the world of work. The curriculum needs to integrate the desired competencies with relevant current literacy. At this time, it is hoped that teachers can also develop their competencies so that they can teach appropriate material to students. Teachers have an important role in the vocational curriculum. Because the teacher does not only act as an educator but also acts as a companion for students to improve their skills. Thus, the preparation of the curriculum requires opinions from several parties such as academia, government and industry. curriculum adjustments, can be rebranded through direct studies to see the needs of human resources in the industry or through comparative studies to more advanced educational institutions both at home and abroad. As for character or soft skills, vocational education must continue to strive to build character for its students, for example by bringing in personality experts or taking advantage of collaboration with industry to bring in the personnel department in related companies to be able to deliver directly up front. students about their needs. The actual workforce, especially with regard to the required character.

Implementation of learning can also be done by looking at the conditions of the area around the place of education. Learning development is carried out by direct example with the potential that exists in the surrounding area. In addition, it is also important to establish partnerships with various stakeholders in order to strengthen the common foundation in building and empowering rural communities. Collaboration in pursuing rural development can be carried out by universities and the Ministry of Villages, Development of Disadvantaged Regions, and Transmigration. An accurate curriculum and support from the government can produce graduates as needed, support innovation and the application of appropriate technology to increase village productivity and develop village potential. Vocational education can play a maximum role in economic development if its alignment with the world of work around it is continuously pursued in the dimensions of quantity, quality, location, and time. Vocational education will also play a maximum role in rural development if it is able to integrate its programs with the existence of government regulations, policies, planning, and budgeting in the current era of regional autonomy.

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