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A Critical Review on Education in The Era of ASEAN Economic Community and Industrial Revolution 4.0: Challenges and Opportunities

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Abstract

This paper aims to examine the opportunities and challenges of education in the Industrial Revolution (IR) 4.0 era in Indonesia. The presence of the ASEAN Economic Community (AEC) in the IR 4.0 era has provided great challenges and opportunities for the Indonesian people, especially in the education sphere. The technological advances in this era have had an impact on the emergence of distance learning and the use of E-Learning (electronic-based learning), which is one form of convenience in learning. It has become imperative for educators to be able to use ICT in learning. However, the negative impacts are changes in values, norms, rules, or moral life, which are contrary to those adopted by the Indonesian nation. These basic values of the nation are expected not to be eroded by the progress of the era. Therefore, the role of education as a place to shape the personality and the nation becomes very urgent.

Keywords: Education, ASEAN Economic Community era, Industrial Revolution 4.0

Education in the Era of ASEAN Economic Community and Industrial Revolution 4.0

The progress of today's world has been marked by the rapid development of science and technology in the era of the ASEAN Economic Community (AEC) and Industrial Revolution 4.0 (IR 4.0). A revolution is generally defined as a rapid change or development that takes place in every aspect of society. It also can be understood as the most spectacular form of social transformation, a sign of historical process change, and the re-establishment of people. Revolution closes old epics and opens new ones. The revolutionary process causes people to explore all potentials, and carry out self-transformation. After the revolution, the whole community will experience a new process, which is said to be a sign of social welfare (Sztompka, 2007). Whereas, the IR 4.0 is interpreted as a technological development that emphasizes the pattern of digital economy, artificial intelligence, big data, robotics, internet, motorized cars, drones, 3-D printing, nanotechnology, biotechnology, materials science, energy storage and computing quantum, which are aimed at the welfare of mankind, and known as the phenomenon of disruptive innovation (Ira, 2018; Tjandrawinata, 2016).

The technological revolution, also known as IR 4.0, will fundamentally alter the way people live, work, and interact with one another. The transformation that is taking place is unlike anything humans have ever seen in terms of scale, scope, and complexity. Humans do not know exactly what will happen in the future. But there is one clear thing, the world must respond to these changes in an integrated and comprehensive manner by involving all global political stakeholders, from the public and private sectors to academics, and of course civil society.

The IR process has started since 1784, known as the first IR 1.0. Its focus was on employing water and steam power to mechanize the production system. Furthermore, IR 2.0, which began in 1870, focused on the use of electric power to carry out mass production. It was followed by IR 3.0 which began in 1969 focusing on the use of electronic power and information technology to automate the production process. Now, the world has entered a new era of IR 4.0, where its strength rests on the third industrial revolution. In this century, It is marked by the unification of three independent fields of science: physics, digital, and biology (Tjandrawinata, 2016).

Various breakthroughs have been realized in the IR 4.0 era. One of them is the emergence of the AEC. Historically, the formation of the AEC was put forward in the ASEAN Summit held in December 1997 in Kuala Lumpur, Malaysia. Results regarding the establishment of the AEC were obtained in the next summit taking place in Bali in October 2003 and the body was officially launched in 2016. At present, the ten ASEAN countries (Malaysia, Brunei, Philippines, Indonesia, Cambodia, Laos, Myanmar, Singapore, Thailand, and Vietnam) have been bound by the agreement.

The main objective of the AEC establishment is to form an economically integrated region in the Southeast Asia region in order to strengthen solidarity and improve the welfare of the people in the ASEAN region. The cooperation is a win-win collaboration, especially in the free flow of goods and services and investments, including the free flow of foreign capital to ASEAN member countries.

The AEC is a single market in the Southeast Asia region, which aims to increase foreign investment in the Southeast Asia region. There is one of the three pillars of the ASEAN community in 2015. They are (1) ASEAN Economic Community; (2) ASEAN Security Community; and (3) The ASEAN Socio-Cultural Community. The pillars are interrelated with and reinforce each other in achieving the goal of sustainable peace, stability and equitable welfare in the region (Hakim, 2013).

Baskoro (2017) further states that the focus of the AEC includes four issues. Firstly, Southeast Asian countries will be made into a unitary market area and production base. It could eliminate obstacles in the movement of goods, services, investment, capital, and skilled labor from one Southeast Asian country to another.

Second, the AEC creates a highly competitive economic region, which necessitates policies encompassing competition policy, consumer protection, Intellectual Property Rights (IPR), taxation, and E-Commerce. Thus, a fair competition climate can be created, which can then be further implemented by providing consumer protection in the form of a network system of consumer protection agents, preventing copyright infringement, developing an efficient, safe, and integrated transportation network, eliminating the Double Taxation system, and increasing online-based trade.

Third, AEC will be used as an area of equitable economic development, with a focus on Small and Medium Enterprises (SMEs). SMEs' competitiveness and dynamism will be further enhanced by improving their access to current information, market conditions, and human resource development in terms of capacity building, finance, and technology.

Fourth, by constructing a system to improve coordination with member countries, the AEC will be fully integrated into the global economy. Furthermore, the participation of Southeast Asian countries in the global supply network will be improved by developing a technical assistance package for less developed ASEAN Member States. This is done in order to boost industrial capacity and productivity. This will not only increase their participation on a regional scale, but will also lead to global initiatives.

Following the new trends brought by the AEC, IR 4.0 is something that cannot be avoided and left behind. As a part of the process, Indonesia must contribute and be able to compete. IR 4.0 has both direct and indirect impacts (positive and negative) on various aspects of life. One of the impacts is that it has made it easier for the flow of information and knowledge to and from each part of the world through space and time. In terms of education, technological advances have an impact on the emergence of distance learning and the use of E-Learning (electronic-based learning), which is one form of convenience in learning. However, the negative impacts are changes in values, norms, rules, or moral life, which are contrary to those adopted by the Indonesians. They hope that the basic values of the nation will not be eroded by the progress of the era. Therefore, the role of education as a place to shape the personality and the nation becomes very urgent.

Law number 20 of 2003 concerning the National Education System in lieu of previous similar laws defines education as a conscious and planned effort to create a learning environment and learning process in which students actively develop their potential to have religious-spiritual power, self-control, personality, intelligence, noble character, and skills required by themselves, society, nation, and country. Education is also a lifelong need, which is mandatory for every human being. In line with this statement, UNESCO (n.d.) explained that education is an organized and sustainable communication designed to foster learning. Furthermore, Article 3 of Law No. 20 of 2003 states that national education functions to develop capabilities and form a dignified character and national civilization in order to educate the nation, to develop students to become human beings who are religious, noble, healthy, knowledgeable, competent, creative, independent, democratic, and responsible.

UNESCO further stipulates that education is an organized and sustainable communication designed to foster learning activities in students. UNESCO then recommends four pillars in the field of education, namely (1) Learning to know; (2) Learning to do; (3) Learning to live together; (4) Learning to be.

1. Learning to know

Learning to know refers to the learning process which enables students to know, to understand, and to internalize knowledge they obtain during the education process. This learning process allows students to be

able to know, understand, apply, and seek information and/or discover science. The students will be embedded in the scientific attitude, namely an attitude of curiosity and encouragement to seek answers to problems faced scientifically that can support the development of science and technology as part of their lives.

2. Learning to do

Learning to do refers to the process of learning to do something. Learning to do (learning by doing) something actively requires education to provide a necessary condition for the provision of the skills. It includes the adaptation of this principle on the curriculum contents, teaching methods, learning materials, and assessment models. Students in the learning process are expected to be able to use various concepts, principles, or rules to solve concrete problems. Using an appropriate teaching method, for instance, students are expected to be able to deal with problems and solve them by using technology-based knowledge.

3. Learning to live together

Learning to live together implies that education should provide the students with the ability to live together in a pluralistic society so as to create peace and tolerance. The development of science and technology that changes the world will not cause any social conflicts. Therefore, learning is expected to allow students to be able to live together with other people. In this case, the teacher's role is to instill a shared attitude, such as tolerance. The students should understand that humans are interdependent with each other.

4. Learning to be

Learning to be refers to education's role to provide students with the ability to develop themselves. The learning process should lead the students to be independent, confident, have self-understanding, self-actualization, self-direction, and intellectual abilities.

The application of the four pillars of learning and technological development in the IR 4.0 era greatly influences the curriculum. This can be seen, for example, from the integration of technology (ICT) into the 2013 curriculum. ICT is a part of the subject matter that must be learned by students (ICT as science). Therefore, it has become imperative for educators to be able to use ICT in learning. They can do it through several ICT-based learning models such as e-learning, blended learning, virtual learning, Computer Based Training, and Open and Distance Learning, which is part of the curriculum (Munir, 2009). It is believed that the use of ICT in learning provides many benefits for educators and students (Mahdum, 2017)

UNESCO explains that the integration of ICT in schools is important to support the dimensions of pedagogy and professionalism so that effective learning processes and results are obtained (Anderson, 2010; Rusli, 2009). UNESCO outlines four stages in the integration of ICT in schools: (1) **Emerging**, which is characterized by the use of ICTs by schools in the early stages, where schools are just starting to buy or finance ICT infrastructure; (2) **Applying**, in which all school components have understood and made use of ICTs to support their work at school; (3) **Infusing**, schools have seriously taken advantage of ICT by applying computer-based technology in laboratories, classrooms, and administration; (4) **Transforming**, ICT has become an integral part of daily personal and professional activities in schools.

Pavlik (1996) researched in the United States on the use of communication and information for educational purposes, and another study conducted by the Center for Applied Special Technology (CAST) found that using the internet as an educational medium resulted in positive learning outcomes for students (Isjoni, 2008). The existence of cyberspace makes learning time more efficient and effective (Mukminan, 2014). The results of the study by Restiyani et al. (2014) explained that the relationship between teacher ICT literacy and its use both as a medium and as a source of learning was significant. Teachers' ICT literacy will have the potential for good use of ICT. Darimi (2017) emphasized in his research that integrating ICT into the learning process plays an important role in developing students' thinking skills, developing ICT skills for a smooth learning process, improving teacher professionalism in ICT use, and transforming schools into creative and dynamic learning institutions that can motivate students to perform better.

Sujoko (2013) mentions four benefits of ICT for education. (1). ICT as a storehouse of knowledge, which is used as a reference for current knowledge, knowledge management, network of experts in various fields of science, networks between educational institutions, the center for developing teaching materials, and a vehicle for curriculum development. (2). ICT as a learning aid which has at least three functions in the learning process: (a) ICT as a teachers aid which includes animated events, student test equipment, teaching reference sources, student performance evaluation, case simulations, visual aids, and communication media between teachers;

(b) ICT as a student-teacher interaction tool which includes teacher-student communication, study group collaboration, and integrated classroom management; (c) ICT as a student aid which includes interactive books, independent learning, problem training, illustration media, lesson simulation, student work tools, and communication media between students. (3). ICT as a learning facility, which is used as electronic libraries, visual classes, multi-media applications, multimedia theater classes, remote classes, electronic boards. (4). ICT as infrastructures in technical assistance can apply for learning both on a medium and large scale. The explanation suggests that ICT-based education is important to be carried out in educational units. Therefore, educators must master ICT and be able to apply it in the learning process.

The era of IR 4.0 requires competitive, innovative, creative, cultured, religious, and skilled human resources. If these qualities are low, it is possible that Indonesian people will only become spectators in their own country. Therefore, various efforts are needed in improving human resources. One of them is by integrating and improving the hard- and soft- skills simultaneously through ICT-based learning. The combination of these two ICT-based abilities is the most important factor in the job market. A survey conducted by the National Association of Colleges and Employee (NACE, 2016) discovers that there are 19 attributes needed in the job market. These attributes can be seen in Table 1.

Table 1. List of attributes needed in the job market

No	Attributes	Respondents %	Classification
1.	Leadership	80.1	Soft skill
2.	Ability to work in a team	78.9	Soft skill
3.	Communication skills (Written)	70.2	Soft skill
4.	Problem-solving skills	70.2	Soft skill
5.	Communication skills (verbal)	68.9	Soft skill
6.	Strong Work Ethic	68.9	Soft skill
7.	Initiative	65.8	Soft skill
8.	Analytical/ quantitative skills	62.7	Cognitive hard skill
9.	Flexibility/adaptability	60.9	Soft skill
10.	Technical skills	59.6	Soft skill
11.	Interpersonal skills	58.4	Soft skill
12.	Computer skills	55.3	Psychomotor hard skill
13.	Detail-oriented	52.8	Soft skill
14.	Organizational ability	48.4	Soft skill
15.	Friendly personality	35.4	Soft skill
16.	Strategic planning skills	26.7	Cognitive hard skill
17.	Creativity	23.6	Soft skill
18.	Tactfulness	20.5	Soft skill
19.	Risk-taker	18.6	Soft skill

Integrating and improving ICT-based hard skills and soft skills will not be adequate without incorporating elements of national characters. As explained earlier, the progress of ICT in IR 4.0 has an impact on morale

and behavior. Therefore, integrating national character in learning (educational character) is important. Lickona (2012) and Berkowitz and Bier (2005) state that educational character is a deliberate effort to develop a good character of both individual and society.

The process of character building emphasizes on how students are given knowledge and understanding of morals and eventually form a belief system. Children do not only need to have an understanding of the values, but also the ability to put them into practice. Therefore, the existing education system must play an active role in supporting and instilling these good values, so that all children love those values as a moral basis in their lives. After forming this understanding and attitude, the children will act with full awareness of these good values and morality which are adopted as expressions of dignity and self-esteem (Fransisca & Clara, 2015). According to Ki Hajar Dewantoro in the Higher Education Curriculum guidebook (2014), a character refers to several good values (such as the value of goodness, willingness to do good things, striving for a good life, and having a good impact on the environment) that are embedded in ones' self and manifested in behavior. It also refers to the characteristic of a person or group of people that contains values, abilities, moral capacity, and determination in facing difficulties and challenges.

In short, the realization of a golden generation or competitive, innovative, creative, cultured, religious and skilled human resources in the era of IR 4.0 can be achieved through an educational process development based on advances in ICT, a competency-oriented curriculum that leads to market sharing and power competitive, ability to communicate, and national character. It is expected that the human resources of Indonesia will be able to raise the nation's status in the world.

Challenges and Opportunities

The condition of IR 4.0 is synonymous with globalization, competition, and survival. This condition has impacted the need for human resources that are highly competitive, innovative, creative, cultured, religious, skilled and ready to use. This will have an impact on all sectors, especially education, as an effort for human investment.

AEC in the era of IR 4.0 provides opportunities for the Indonesian people. This is indicated by the large population, most of them are in the productive age and middle class. In addition, of the geographic location and the value of Indonesia's largest Gross Domestic Product (GDP) in ASEAN. It has the potential to be an asset for Indonesia in its quest to become a major player in the AEC. The AEC is a good opportunity for Indonesia because trade barriers tend to decrease and even disappear. This will have a knock-on effect on increasing exports, which will boost Indonesia's GDP.

On the other hand, Indonesia faces new challenges regarding the commodity homogeneities in trade, such as rubber, wood, textiles, and electronic products (Santoso, 2008). In this case, competition risk arises as a result of a large number of imported goods flowing into Indonesia in large quantities, threatening local industries' ability to compete with far more qualified foreign products. In the end, it will increase Indonesia's trade balance deficit. Another challenge that must be faced by the Indonesians is the readiness of human resources. Based on the human development index (HDI), Indonesia has a moderate HDI category. Besides, based on the Global Competitiveness Index (GCI) of 2017-2018 (WEF, 2017), Indonesia ranks fourth, under Singapore, Malaysia, and Thailand. One reason for this problem is the low quality of Indonesian education. This is evidenced by the results of the GCI, which explains that Indonesia is still ranked 47 and 64 from 137 countries in terms of the first pillar (institutions) and the fifth pillar (higher education and training).

This issue corresponds to reality in the field which is caused by several factors. Some of them are related to the learning process which has not received optimal attention; educators who do not understand the functions and objectives of education; teachers who work individually; Local Teacher Board does not run optimally; and the use of ICT, which is still limited to the use of presentations, particularly power points (Mahdum, 2019). The internet is still used to find information about the material to be delivered rather than as a new integrated learning system, and social networking is still not widely used as a new learning system to improve the effectiveness and efficiency of the learning process (Astawa, 2017; Husain, 2014, Mahdum, 2017). The low ability of educators has impacted the quality of graduates who are expected to become a golden generation.

The data confirm that some of the Indonesian human resources are still not ready to face the IR 4.0 era. Therefore, various efforts are needed, especially in the field of education in overcoming challenges. Specifically, the efforts that can be made to improve the quality of education in the IR4.0 era are outlined as follows: First, there is a need for an emergence of government policies in the face of the IR 4.0 era. Mohammad Nasir, the minister of the Higher Education explains that the government's efforts focus on institutional, learning and student programs. Among them is the reorientation of the curriculum to build competencies needed in the IR

4.0 era by liberating the nomenclature of study programs to support the development of industry competencies. In addition, the government is also drafting steps to deal with the AEC through the Indonesian government's strategic plans. These steps include:

1. Increasing economic competitiveness. On May 27, 2011, the Indonesian government unveiled the Master Plan for Accelerating and Extending Indonesian Economic Development.
2. Launching the "I Love Indonesia Program," one of the "Nation Branding" movements as part of the creative economy's development.
3. Strengthening the SMEs sectors.
4. Improving the infrastructure. In order to support the improvement of the real sector's competitiveness, during 2010 the capacity and quality of infrastructure have been successfully achieved such as road infrastructure, railways, land transportation, sea transportation, air transportation, communication and information technology, and electricity.
5. Improving the quality of human resources.
6. Conducting both institutional and government reforms. A national strategy for the prevention and eradication of corruption has been established as a reference for all stakeholders for the implementation of actions every year in order to encourage the acceleration of prevention and eradication of corruption in the long-term of 2012-2025 and medium-term of 2012-2014. Coordination and supervision provided by the Corruption Eradication Commission to the Attorney General's Office and the Police have increased efforts to combat corruption crime.

Second, there is a need for establishing creative, innovative, multidisciplinary and entrepreneurial institutions. It is time for the universities to act as the driving force for innovation and technology development in Indonesia by supporting a synergy between the government, private sectors and universities. This trend will turn into Triple helix (T-helix) cooperation which does not only involve universities, the private sectors, and the government, but also community groups, philanthropy, and domestic and foreign organizations. T-helix is an innovative model that describes the relationship between government, academics, and business (Dhewanto et al., 2014). Gardiner et al. (2017) remarked the cooperation between the three parties is then expected to produce mutual benefits, which can be seen in Table 2.

Table 2. Benefits of Triple Helix Collaboration

Government	University	Company
1. Enhancing economic growth (research-driven economy or knowledge) and achieving development targets	1. Producing knowledge in order to produce more competent graduates	1. Implementing the results of research to produce innovative products that have high competitive value
2. Producing effective and targeted policies	2. Improving the reputation of educational institutions as research-based	2. Encouraging efficiency through reducing costs due to production innovations

Through T-helix cooperation, research made by academics can be implemented to nation-building through the application of industry and policymaking. Thus, the funds spent on research do not only end up in the laboratory or reports. T-helix requires close cooperation and understanding of each party. The government must also provide more favorable incentives for companies and universities to collaborate, through various regulations

that benefit both parties. The complete implementation of the T-helix model is indicated when there is a significant improvement of the Indonesian human resources to successfully compete in the IR 4.0 era.

Third, there should be creative and innovative education programs. Higher education has developed programs and service models that provide or use digital technology. Bardono (2018) in his remarks emphasized that the government had built industrial 4.0 teaching factories and conducted online lectures. Online lectures or Distance Learning are aimed at increasing the capacity and quality of higher education in a flexible manner. It can be implemented on courses, study programs, and universities that have been based on cyber universities. Indonesia has Open University which has been further developed and acts as Cyber University. The implementation of Open University must pay attention to quality. Human resources, school management, public relation, achievement and implementation of learning must be standardized. In addition, the education program shifts to new literacy, namely communication literacy, scientific literacy, technology literacy, and human literacy. In general, the government has made changes to policies and programs related to higher education science and technology resources, institutions, learning and student affairs, research and development of the innovation spirit.

Educational innovation programs can be done by adopting and adapting various sources, without leaving the nation's identity and ideology. The ability to make a network worldwide is urgent. The IR 4.0 era opens opportunities for the broadest possible cooperation so that employment opportunities and the development of human resource competencies will increase and be able to compete at the international level. In relation to the need for creative and innovative education programs, there is a need for renewing curriculum content by adjusting curriculum content to the needs and demands of the workforce. An assessment carried out should focus on students' abilities (skills) before entering the workforce. Therefore, planning and learning processes are needed to support the implementation of the assessment.

In this regard, universities and schools need to look for innovative methods to develop students' cognitive capacity (higher-order thinking skills, critical and systemic thinking skills), cultural maturity, and entrepreneurship skills. Some learning approaches that lead to IR 4.0 era are through applying E-Learning, Technological Pedagogical and Content Knowledge (TPACK), use of WEB, and competency-based learning (Hadriana & Mahdum, 2015; Mahdum, 2015). Faridi (2009) added that ICT mastery is a necessity for catching up with the IR 4.0 era. All of these new approaches are expected to boost the quality of Indonesian education.

Fourth, there is a need to upgrade the quality and capacity of lecturers and tutors in terms of E-learning or blended learning. It is also important to develop the MOOC (Massive Open Online Course), infrastructure, teaching industry, and actual e-library which are already running (Ira, 2018). The current condition of Indonesian lecturers is still dominated by the baby boomers and generation X who are digital immigrants, while the students they face are millennial or digital native generations. Thus, the Ministry of Research, Technology and Higher Education advises all lecturers to be adaptive to the progress of the times.

Directorate General of Higher Education, the Ministry of Research, Technology and Higher Education seeks to add lecturers from the millennial generation, one of which is through the Master's Degree Program to Winning Doctoral Degrees, namely master and doctoral acceleration scholarship programs for bachelor graduates within four years. There are at least five qualifications and competencies required for lecturers, including (a) educational competence, a competency-based on the internet of things as basic skills in this era; (b) research competence, competence in building networks to foster knowledge, research directions, and skilled in obtaining international grants; and (c) technological commercialization competence, having the competence to bring groups and students to the commercialization of technology on the results of innovation and research; (d) competence in globalization, a global mindset, cultural stock, hybrid competencies, global competence, and national problem solving; (e) competence in future strategies, where the world changes quickly, so that it has the competence to predict exactly what will happen in the future and its strategy, by conducting joint-lecture, joint-research, joint-publication, joint-lab, staff mobility and rotation and understanding the direction of the industry.

Improving the quality of human resources (lecturers and teachers) is directed in the form of research and service studies. This means that lecturers and teachers must focus on conducting research-based teaching. It will have an impact on the emergence of innovation and creation in improving education. This is in accordance with the goals and objectives of the Ministry of Research, Technology and Higher Education of 2015-2019 which explains the increasing relevance and productivity of research and development. Thus, the research conducted by the lecturers is obliged to promote the achievement of the vision, mission, and objectives set by the National Long Term Development Plan, which is summarized in the National Research Master Plan.

Research and other efforts (publications) made by lecturers are a real effort to improve the quality of education. The focus of the field of study, which involves the progress of the era, is a form of realization of the goodwill of educators in facing the IR 4.0 era. This is based on the development of the times and new literacy. Therefore, education and teaching refer to Research-based Teaching in the RI 4.0 era by not ignoring Society 5.0 which can include (1) humility; (2) open mind; (3) listing skills; (4) teamwork; (5) networking; (6) problem solving; (7) professionalism. The graduates are adaptive and able to find various innovations through research that is developed. More details can be seen in Figure 1.

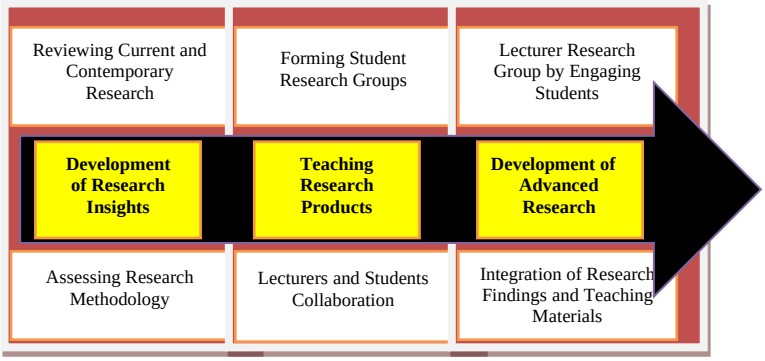

Figure 1 confirms that research and the teaching process should lead to the progress of the IR 4.0 era and in accordance with the National Development Master Plan. The focus is to produce high-quality graduates, who are ready to compete at the international level. Improving the quality of lecturers and teachers can be done through increasing teachers' competence (professional, pedagogical, personal, and social). Based on 21st-century learning, the ability to utilize ICTs is an important skill in facing the IR 4.0 era. The results of the research are expected to be immediately used by the community in the form of services. The running of the AEC and IR 4.0 era is closely related to a nation's productivity. The professional ability and novelty of a research finding become a dominant factor. All of these breakthroughs are expected to improve the quality of Indonesian education. The increase in the quality of education is later hoped to lead to the improvement of human resources who can compete at the international level.

Conclusions

Both Asian Economic Community and the Industrial Revolution 4.0 are unavoidable era. The presence of the AEC in the IR 4.0 era has provided great challenges and opportunities for the Indonesian people. The challenges will be severe and the opportunities will be missed, if the Indonesian nation is not able to prepare all necessary conditions to make use of it for the betterment of the nation. One of the forces that can improve the nation is through enhancing the quality of education. This includes improving educational programs, institutions, management information systems, and increasing human resources.

Improving the aspect of education must lead to the use of ICT integrated with national values. Thus, the golden generation of human resources of the Indonesian nation will be able to participate and successfully compete in the IR 4.0 era without losing the Indonesian national identity.

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Biography

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