

The Challenge of Being a Teacher in Industrial Revolution 4.0

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ABSTRACT

The whole world is now in the fourth industrial revolution known as the 4.0 Industrial Revolution which is soon entering the 5.0 industrial revolution. Now all lines are required to carry out activities disruptively, where this innovation is developing very rapidly, so as to help create new markets, including the world of education. Facing the big challenges now, education is demanded to participate in making changes. Not only at one level, but all levels that occur from kindergarten to college. The era of education which was influenced by the industrial revolution 4.0 is well known is as Education 4.0. Indonesia is still relatively slow in responding to the industrial revolution 4.0 compared to ASEAN member countries such as Malaysia and Singapore. The new 4.0 education system resonates loudly this year. Therefore, the government must provide adequate facilities in welcoming the era of Education 4.0. As the front guard in the world of education, teachers must improve their competence in facing the era of Education 4.0. Moreover, the education system in the Covid -19 pandemic requires that the education system must be able to make the internet as a learning tool today. Today's students are millennial who struggle in the digital world every day.

Keywords: *industrial, revolution, disruptively, education*

1. INTRODUCTION

Education currently faces various challenges, among others it can be seen from the character of children. The character of today's children is more eccentric and at will. Children tend to be selfish, don't like to work together. This is due to the fact that they often prefer to play games on Android phones rather than traditional games that teach behavior to work together. This phenomenon cannot be denied, whether in the city or even in remote villages. The character of children in some millennial generations is cause for concern. They sometimes do not respect their parents or teachers. Even from them also sometimes trapped in the world of crime and drugs. Millennial generation in the interest in learning also experienced a setback. In the millennial era, humans began to leave conventional ways of living life, replaced by trends and lifestyles that are more fresh and youth, or commonly known as "present". An HMI activist, Muhammad Ridal, in his book [1] entitled "Millennial HMI" revealed that 33% of the Indonesian people today are millennial.

According to [1], the millennial era is generally dominated by people born in the 1980s to the 2000s, and aged 15-34 years. This age, of course, is the age where individuals are still students in school. The teacher is "the educator who gives lessons to students [2]. The broader understanding of the teacher is stated by [2] that teacher is everyone who has given a certain knowledge or intelligence to a person or group of people. As part of the education component, a teacher has a vital role for success in an education, although in learning now a teacher acts more as a motivator, but his existence cannot be replaced by other educational media, even though the tool Therefore, teachers are part of the decisive element of education Facing great challenges in the disruptive era, education is demanded to change, including education at primary and secondary levels of education. The era of education influenced by the industrial revolution 4.0 is called Education 4.0 Education 4.0 is an education characterized by use of digital technology in the learning process, also known as the cyber system. This system is able to make the

learning process can take place continuously without space and time limits.

Given these great challenges, teachers must continue to learn to improve competence so that they are able to face millennial generation students. Do not let the term arise, learners of the industrial era 4.0, learn in industrial space 3.0, and be taught by industry teachers 2.0 or even 1.0. If this happens, then our education will continue to lag behind other countries that are ready to face this great change. The quality of teachers must match the performance of teachers needed in the industrial era 4.0. The era of education 4.0 is a very difficult challenge for teachers. Jack Ma (CEO of Alibaba Group) at the 2018 World Economic Forum annual meeting, stated that education is a big challenge this century. If we do not change the way we educate and study, the next 30 years we will experience great difficulties. Education and learning that are loaded with knowledge overriding the content of attitudes and skills as currently implemented will result in students who are unable to compete with machines.

Therefore, teachers must reduce the dominance of knowledge in education and learning in the hope that students will be able to surpass machine intelligence. Education balanced with character and literacy makes students very wise in using machines for the benefit of society. The era of education 4.0 is the answer to the 4.0 industrial revolution.

Teachers are needed in the face of the educational era 4.0. Teachers have a greater responsibility in educating students to face the Industrial Revolution 4.0. Teacher 4.0 is a teacher who is able to master and utilize digital technology in learning. The industrial revolution 4.0 was marked by the presence of four things, namely super computers, artificial intelligence, cyber systems, and manufacturing collaboration. Thus competencies are needed that are able to offset the presence of these four things in the era of Education 4.0. The competency needed is one of the projected 21st century competency needs.

2. RESULT AND DUSCUSSION

2.1. Expected Teacher Competencies

The competencies needed in the Education 4.0 era: First, critical thinking skills and problem solving (critical thinking and problem solving skills). This competency is very important for students in 21st century learning. Teacher 4.0 must be able to mix learning so that they can explore this competency from students. Second, communication and collaborative skills (communication and collaborative skills). As a competency that is needed in the 21st century, this skill must be able to be constructed in learning. The learning model based on information and communication

technology must be applied by the teacher to construct communication and collaboration competencies. Third, creative thinking and innovation skills (creativity and innovative skills).

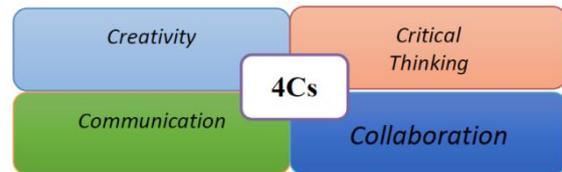
The 21st Century skills are (1) life and career skills, (2) learning and innovation skills, and (3) Media information and technology skills. These three skills are summarized in a scheme called the 21st century 21st century knowledge-skills rainbow skills rainbow as [4] The scheme was adapted by the non-profit organization P21 developing a 21st century educational framework throughout the world through the site www.p21.org based in the state of [5]. The concept of 21st century skills and core subject 3R, are described below. Figure 1 shows a rainbow of knowledge skills schemes 21st century.



Source: [3]

Figure 1. Knowledge Skills Schemes 21st Century

As we know that the focus of 21st Century Education expertise currently covers creativity, critical thinking, communication and collaboration or known as 4Cs [4].



Source: [3]

Figure 2. The 21st Century Skills

The industrial revolution 4.0 requires students to always think and act creatively and innovatively. This action needs to be taken so that students are able to compete and create industry-based jobs 4.0. This condition is needed considering that there are many victims of the industrial revolution 4.0. For example, many professions have been replaced by digital robotic machines. For example, payment of toll roads using e-tolls. This system has forced toll road managers to lay off workers that have been used at every toll gate. Fourth, information and communication technology literacy. Information and communication technology (ICT) literacy is an obligation for teachers 4.0. ICT literacy must be done so as not to be left behind by students. ICT literacy is the basis that teachers 4.0 must

master in order to be able to produce students who are ready to compete in the face of the industrial revolution 4.0. Fifth, contextual learning skills. Contextual learning is learning that is very appropriate to be applied by teacher 4.0. If the teacher has mastered ICT literacy, then contextual learning in education era 4.0 is easier to do. The current condition of ICT is one of the contextual concepts that must be introduced by the teacher.

Many contextualized learning materials are ICT-based so teacher 4.0 is much unprepared if it does not have ICT literacy. Difficult material that is abstract can be presented to be more real and contextual. Sixth, information and media literacy. Many social media are loved by students. Social media seems to be a powerful communication medium used by students and teachers. Social media is one of the learning media that can be utilized by teachers 4.0. The presence of digital classes in the form of social media can be utilized by teachers, so that learning takes place without limits of space and time. Teachers must be prepared to face the era of education 4.0 despite being preoccupied by a very dense curriculum and administrative burden. If not, our young generation will continue to be left behind and the effect will not be able to compete with the implications of the Industrial Revolution 4.0.

2.2. Teacher Challenges in the Formulated Era

The image and concept of the teacher in contemporary society is very much different from the concept of the past. The past teacher meant a person of knowledge, who was wise and wise. Now teachers are seen as educational functionaries whose job is to teach on the basis of certain scientific and academic qualifications. With this assignment, the teacher receives material rewards from the state or education management. Thus, the most important factor in the teaching profession is scientific and academic qualifications.

While wisdom is moral attitudes and behaviours are no longer significant. In the classic concept, moral factors are above teacher qualifications. The challenges of teachers in the millennial era are very heavy compared to teachers in the previous era. In addition to mastering aspects of scientific material being taught, Teachers are required to understand technology and always be a creative and innovative person. Teachers must become role models for students in the millennial generation, so students understand the limitations of technology, so as to avoid the wrong use of technology. The challenge for teachers does not stop here, the millennial generation is not a generation that can be forced, for example by prohibiting students from carrying cell phones. Teachers in the current era must be more open with new thoughts. Teachers are required to educate students according to their times. As long as it does not conflict with existing norms, of course the presence of technology should not be questioned. A good persuasive approach is more prioritized than carrying out policies that appear authoritarian or force the will [5].

Teachers can provide understanding to students through concrete policies by utilizing technology in learning, such as e-learning, or using social media, etc. Students actually get education that technology when used properly actually has a positive impact. In general, teachers should understand the social changes that exist in the current era. He did not stop learning about new things. The global challenges of the present era are also different from the global challenges of the past era.

Whatever steps and methods taken by the school certainly aim to shape character and prepare quality human resources in Indonesia. The future of Indonesia is in the classrooms that we teach. Another challenge of education in the millennial era now is that information comes faster, is massive and is widespread, so it cannot be overcome by simply changing the curriculum. The number of times the curriculum change will never be able to catch up with the acceleration of existing information. Therefore, the teacher and student approach to interacting will be more important. Need exemplary, build will, and strengthen - with the provision of knowledge of course - so that their students are able to overcome the challenges of his life. The final challenge for a teacher is the four skills given to students from an early age, namely giving birth to thinkers, giving birth to communicators, giving birth to collaborators, and giving birth to inventors or creators.

2.3. Teacher Strategies in Facing Disruptive Era

Some strategies that teachers do to improve the quality of education, are: (1) changing mind-sets even though it is difficult and turbulent, (2) making literacy conscious movements, (3) conducting training/movements of teachers, employees, and technology-based students, (4) innovating learning and (5) igniting to create digital-based simple technology in schools. All that is needed is good time management and cost (school management), commitment of all parties, habituation of application in class and collaboration with each other. All the renewals in learning still do not forget local wisdom and national identity (character). Learning STEM (Science, Technology, Engineering and Mathematics) is also being promoted as an effort to improve the quality of learning [8]. Some teachers have carried out IT-based learning and invited students to practice the questions with interactive quizzes, crossword puzzles using Android, and so on. Learning begins with various models so that it is more interesting and enjoyable. Students are invited to engage directly through projects, practicums or role playing so that what they learn is familiar with everyday life.

The demands of professionalism have also forced teachers to develop themselves through literacy activities, work through writing (scientific publications) and to innovate by making various learning tools. These changes are indeed not maximal and comprehensive. However, this pioneering teacher will ignite the enthusiasm of his fellow teachers to improve their quality. A conducive climate is absolutely necessary in

this regard. So, what teachers must prepare is to have the "21st Century Character" [6], namely:

First, the teacher must have a passion for learning. This is necessary so that teachers master the changing values, social and psychological development of the community.

Second, develop learning media that are effective, creative and innovative so that all the knowledge delivered by the teacher can reach students. Third, to upgrade technology capabilities, teachers are needed by teachers both in planning, implementing and evaluating learning. Fourth, have a high sense of empathy because the teacher's job is not only to teach but also to educate. Teachers must be able to instill good values in the hearts of students, form good character and have faith based on their respective religions and beliefs.

Fifth, prepare yourself to be able to be a good role model for students. The strategies adopted are: first, make changes in learning. This is done by implementing HOTS (High Order Thinking Skill) based learning through 4C (Critical thinking, Creative, Communication and Collaboration), STEM based learning through various models such as Discovery Learning (DL) or Project Based Learning (PBL) and Problem Based Learning (PBL). Sixth, through Strengthening Education Character (PPK) is integrated in learning. There are five characters, namely: religious, nationalist, independent, integrity and mutual cooperation.

Last, through careful selection. The role of a teacher in delivering students is to equip them to be a generation that is strong and of character, will not be replaced by anything in the form of material. This heart approach is not hindered by time, place or anything. That is what makes the teacher will never be replaced by machines or other artificial intelligence.

2.4. Teacher understanding and update in IT

Rector of the University of Medan, Professor. Syawal Gultom, during a Public Hearing Meeting (RDPU) with Commission X of the Indonesian Parliament, in Senayan, Jakarta, and Thursday, December 5, 2019 stated that in the 21st century teachers must know current issues, starting from the Internet of Think, Big Data, to Artificial Intelligence. He also explained that currently learning has implemented blended learning, between face to face and the use of the Internet of Think. Meanwhile, according to him, teacher competency development must have a good pattern, namely there is systematic structured teacher training in accordance with his career path [7].

According to Professor Syawal there are 7 pillars that need to be done by teachers in teaching English in the 21st century (1) Teachers must have a policy to strengthen the teaching of English, teachers must be able to put English teaching in the right reasons, Professor. Syawal said that there are 15 reasons why students want to learn English, one of which is that they look more sociable and smart. For this reason teachers must be good at using these reasons to encourage students to learn English, (2) Teacher professionalism in

which teachers must be able to understand and use IT and ICT (3) Student motivation in learning English so that it becomes a pride for students (4) Teachers must introducing content appropriate to the 21st century for that it must map teachers how many teachers master IT, (5) Teachers must understand developing digital-based content in their teaching, (6) Bandwidth, because this is necessary if you want to develop digital content, and finally (7) schools must have a helpdesk so if there is a problem they know who to meet.

3. CONCLUSION

In this era of globalization and information, teachers face challenges in the form of the behaviour of students who enjoy surfing in cyberspace through their android, gadgets or sophisticated mobile phones. This student behaviour is characterized by a tendency to prefer reading through mobile phones rather than books, happy to find various information on their own without checking first, happy looking for friends through social media accounts, and seeming individualistic. For this reason, teachers in learning must be able to utilize Information Technology, use fun methods, enrich their knowledge with various sources of reading material, and be able to conduct research. Some teachers are ready to face the Industrial Revolution 4.0 era, but some others are not ready. The challenges faced by teachers in this era are mastery of IT, professionalism, learning creativity, the mismatch of time with the learning load, and the attitude of not wanting to change from the teacher. Teachers are required to have the character of the 21st Century. The strategy adopted by teachers to prepare for the Industrial Revolution 4.0 era is to upgrade abilities, change mind-sets, take part in training, innovate learning and promote literacy skills.

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