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MODERN EDUCATION IN REVOLUTION 4.0

WERTI TANGAHU
Department of Basic Education, Postgraduate Program Gorontalo State University

ABDUL RAHMAT
Department of Basic Education, Postgraduate Program Gorontalo State University
abdulrahmat@ung.ac.id

RUSMIN HUSAIN
Department of Basic Education, Postgraduate Program Gorontalo State University
rusmin.husain@ung.ac.id

ABSTRACT
This study aims to describe modern education in the 4.0 revolution. This research was conducted through literature studies by collecting and examining a number of journals or literature that have a connection with modern education in the 4.0 revolution considering that during the current pandemic, education should lead to the use of various technologies to support the success of the learning process in schools. Then in data collection, the researcher reads and examines various literature to describe modern education in the 4.0 revolution. Based on the research results, education must be able to direct and shape students who are ready to face the industrial revolution era by emphasizing the fields of Science, Technology, Engineering and Mathematic or STEM. Then learning based on HOTS (High Order Thinking Skills) to meet these demands. HOTS-based learning allows students to apply their knowledge and abilities to make critical reasoning. Learning in the 21st century must also be adjusted so that the learning outcomes can provide 21st century skills to students, namely 4C which includes: 1) Communication, 2) Collaboration, 3) Critical Thinking and problem solving, and 4) Creative and Innovative.

INTRODUCTION
The industrial revolution 4.0 contributes as well as has a big influence in the world of life. Of course, this has a very significant impact on education, especially in Indonesia. This influence brings about changes in interactions that were previously face-to-face in class, which results in a metabolism with the internet (online). No exception is also the activity in learning evaluation, in the form of facilities that are able to support learning activities in the classroom which are connected to the internet network as a collaborator to integrate face-to-face activities with the internet network.

The revolutionary paradigm that continues to develop is periodically initiated by advances in science and technology as supporters of this reform. The world of education in the development of the revolutionary era continues to be required to improve the system. Liao, et al. Continued, there were three countries at the top in planning the development of the Industrial Revolution. The three countries, namely America, France and Italy, are investing in research and innovation, employment, education, training and infrastructure modernization. One of the investments that supports the advancement of human civilization is education. As Shahroom and Hussin said, education in the future will experience significant changes. The learning process no longer needs to be done in the classroom (Choliyi, 2019: 1).

The era of the Industrial Revolution 4.0 is now a widely discussed issue, including in Indonesia. The era of revolution in global flows according to Prasetyo and Trisyanti (2018) has started since the 18th century and was marked by the discovery of a steam engine that allowed the production process to be carried out in bulk. The Revolutionary Era at that time was called the Industrial Revolution 1.0. Entering the 19-20 century, the Industrial Revolution 2.0 began to enter with the presence of electricity, where the invention helped reduce production costs. Industrial Revolution 3.0 entered around the 1970s with the power of computerization. Science and technology which continues to develop brings civilization forward. In 2010, through intelligence engineering and the internet of things, globalization has entered the era of the Industrial Revolution 4.0 and made it easier for people to do activities with a more effective and efficient time (Choliyi, 2019: 1)

Theorists in education integrate various ways of integrating technology both physically and not into learning methods, so that it is known as the general term Education 4.0 or Education 4.0. Before education 4.0, we first knew about education 3.0 and according to Jeff Borden, education 3.0 was an education that included learning neuroscience, psychology and technology in education using web-based digital and mobile technology, applications, systems, devices and so on. This phenomenon in education 4.0 creates a new revolution in the fourth industry called (4IR) or (RI4) which aligns humans and machines to get solutions, solve problems and new innovations (Rahardja, 2020: 2).

In this era of disruption, the world of education is required to be able to equip students with 21st Century Skills. These skills are the skills of students who are able to think critically and solve problems, be creative and innovative as well as communication and collaboration skills. In addition, the skills to seek, manage and convey information are also skilled in using information and technology. Some of the abilities that must be possessed in the 21st century include: Leadership, Digital Literacy, Communication, Emotional Intelligence, Entrepreneurship, Global Citizenship, Problem Solving, Team-working (Risdiyanto, 2019: 3).

RESEARCH METHODS

To collect information relevant to this study, researchers used the literature study method, namely by searching for literature in the form of journals. This is intended to describe the problems to be studied, namely about learning in the era of revolution 4.0. Then the data analysis uses critical analysis to examine some literature so that it can be described in this study.

RESULTS AND DISCUSSION

EDUCATIONAL CURRICULUM 4.0

The following will describe the exposure contained in Piterlaser's research (2019: 35):

The Industrial Revolution 4.0 which is full of super-fast technology will bring significant changes, one of which is the education system in Indonesia. Changes in the education system will certainly have an impact on curriculum reconstruction, the role of teachers as educators and the development of ICT-based educational technology. This is a new challenge to revitalize education, in order to produce smart, creative and innovative people who are able to compete globally. Many studies suggest that the implementation of the curriculum in the field has experienced degradation that is out of context and is no longer oriented to the achievement of students' abilities in understanding science in the context of life and daily practices, but only revolves around the target of achieving the competence of students which is described only in academic values.

Aligning learning at the practical level adjusted to the curriculum construct is the first focus of competing homework in the field of education. Curriculum policies must elaborate on students' abilities in the pedagogical dimensions, life skills, and the ability to live together (collaboration), and think critically and creatively. Prioritizing 'soft skills' and 'transversal skills', life skills, and skills that are not visibly related to a particular field of work and academics. However, it is widely useful in many work situations such as critical and innovative thinking skills, interpersonal skills, global citizenship, and media and information literacy.

Then in his research explained that the development of an educational curriculum must be able to direct and shape students who are ready to face the industrial revolution era by emphasizing the fields of Science, Technology, Engineering and Mathematics or STEM. The curriculum should refer to the teaching of information technology. Especially in the current pandemic situation, education should be more competent and able to undergo learning across time and space. This means being able to use technology to carry out the learning process.

The process of learning is not always face-to-face but can be done through the internet (online). Learning is set up in such a way as to foster desire and be able to achieve learning goals. If you look at the process of change caused by the industrial revolution, where almost all students can access technology in the form of android, then the pouring of the learning process through the use of technology (android) can spread and can educate students anywhere and anytime. Of course this can be the newest alternative in the learning process, so that learning is not always in the classroom.

LEARNING IN THE REVOLUTIONARY ERA 4.0

In terms of information and communication technology consists of two separate definitions, namely information technology and communication technology. Information technology includes all matters relating to the process, use as a tool, manipulation, and information management. Communication technology is everything related to the use of tools to process and transfer information from one device to another. The concept of the industrial revolution 4.0 is a concept that was first introduced by Professor Klaus Schwab. He is a well-known German economist and the initiator of the World Economic Forum (WEF), which through his book, The Fourth Industria Revolution, states that the industrial revolution 4.0 can fundamentally change the way we live, work, and relate to one another (Piterlase, 2019: 31).

Sujana & Rachmatin explained that the digital era as another name for the development of the Industrial Revolution 4.0 is a driver of technological progress, including advances in education. This progress makes it easier for students to fulfill their knowledge needs by finding, evaluating, organizing, and communicating the information obtained to solve the problems at hand (Choliyi, 2019: 4). Then the existence of technology and information can facilitate the continuity of learning in schools. Meanwhile, according to Budiman, the existence of increasingly sophisticated technology also facilitates the learning process and the existence of technology makes education shift from conventional to flexible learning (Choliyi, 2019: 4).

Education 4.0 is a general term used by education theorists to describe various ways to integrate cyber technology both physically and indirectly into learning. This is a leap from education 3.0. Education 3.0 includes the confluence of neuroscience, cognitive psychology, and educational technology, using digital and mobile web-based, including applications, hardware and software. Education 4.0 is a phenomenon that arises in response to the needs of the 4.0 industrial revolution, where humans and machines are aligned to find solutions, solve various problems faced, and find new possibilities for innovations that can be utilized for the improvement of modern human life (Piterlase, 2019: 32).

Dinni explained, this technological progress is expected to meet the demands of the 21st century, where education must be able to develop students' abilities and skills to solve problems in everyday life (Choliyi, 2019: 5). This demand indirectly also requires teachers to continue to upgrade their abilities in order to be able to produce students who are competitive and able to think at high levels. Hidayati Teachers can apply HOTS (High Order Thinking Skills) based learning to meet these demands. HOTS-based learning allows students to apply their knowledge and abilities to make critical reasoning (Choliyi, 2019: 5)

In learning, especially in the era of the technological revolution, there should also be the latest innovations in the world of education so that they are able to provide educational services that are more maximal and more effective and efficient. Pervical and Ellington stated that the learning innovations that were developed in digital technology were utilizing information technology facilities that developed rapidly in the era of the industrial revolution 4.0 (Syamsuar, 3). Furthermore, Reigeluth (2011) defines that educational innovation in learning methods includes formulations about organizing teaching materials, delivery strategies and management of activities by taking into account the objectives, obstacles, and characteristics of students so that results are effective, efficient, and cause learning attractiveness (Syamsuar, 3).

HOTS LEARNING MODEL IN THE INDUSTRIAL REVOLUTION ERA 4.0

Based on Bloom's Taxonomy which has been revised by Krathwoll and Anderson, the abilities that students need to achieve are not only LOTS (Lower Order Thinking Skills), namely C1 (knowing) and C-2 (understanding), MOTS (Middle Order Thinking Skills), namely C3 (applying) and C-4 (analyzing), but there must also be an increase to HOTS (Higher Order Thinking Skills), namely C-5 (evaluating), and C-6 (creating) Entering the development of information technology and the industrial revolution 4.0 in the 21st century, then learning in the 21st century must also be adjusted so that the learning outcomes can provide 21st century skills to students, namely 4C which includes: 1) Communication, 2) Collaboration, 3) Critical Thinking and problem solving, and 4) Creative and Innovative (Wena, 2020: 19).

The implementation of the 2013 Curriculum is one of the steps to create a generation in the 4.0 revolution era. Regarding the learning approach, the K-13 curriculum mandates the application of a scientific approach (5M) which includes observing, asking questions, gathering information, reasoning / associating, and communicating. Higher Order Thinking Skill (HOTS) is a program developed by the Ministry of Education and Culture through the development of learning oriented towards higher order thinking skills. The Directorate

General of Teachers and Education Personnel (Ditjen GTK) is in an effort to improve the quality of learning and improve the quality of graduates (Wena, 2020: 19).

This HOTS-oriented learning program was developed following the policy direction of the Ministry of Education and Culture which in 2018 has integrated Strengthening Character Education and Higher Order Thinking Skill (HOTS) oriented learning. Through the application of HOTS or High Level Thinking Skills, the government expects students to achieve various competencies, namely critical thinking, creative and innovative thinking, communication skills, collaboration skills and self-confidence. (Confidence). The five things conveyed by the government that are the character targets of students are attached to the evaluation system in education in Indonesia and are the skills of the 21st century (Wena, 2020: 20).

COMPETENCIES AND SKILLS IN THE 4.0 REVOLUTION ERA

The following will describe an explanation of Piterlase (2019: 36); attitudes or skills that teachers need to have in the face of the Industrial 4.0 era include:

a. Friendly with Technology

   The world is always changing and developing to a higher level, one of the changes is marked by technological advances. Everyone will not be able to fight technological advances, therefore, in order not to be crushed by them, teachers must have the will to study continuously. Changes in the world by technological advances do not need to be a threat, but should be faced positively, learn and adapt, and are willing to share with colleagues or colleagues both success and failure.

b. Cooperation (Collaboration)

   Maximum results will be difficult to achieve if done individually without collaboration or collaborating with other people. Therefore, teachers must have a strong will to collaborate and learn with and or from others. This attitude is needed now and in the future. Doing it is not too difficult, because the world is interconnected, so there is no reason not to collaborate with others.

c. Creative and Taking Risks

   Creativity is one of the skills needed in the Top 10 Skills 2020, creativity will produce a structure, approach or method to solve problems and answer needs. Teachers need to model this creativity and try to be smarter how this creativity is integrated into their daily tasks. Educators also need not be too afraid of making mistakes, but are always ready to face the risks that arise. Mistakes are the first step in learning, and need not be a factor in keeping you going, mistakes are to be corrected.

d. Has a Good Taste of Humor

   The humorous teacher is usually the teacher most often remembered by students. Laughter and humor can be important skills to help build relationships and relax in life. This will reduce stress and frustration, as well as give other people the opportunity to see life from a different perspective.

e. Teaching Whole (Holistic)

   In various learning and learning theories we recognize individual and group learning. And, recently, learning and learning styles that are individual, are increasing. Therefore, today's teachers need to identify students individually, including their families and how they learn (to know them completely, including the obstacles they experience both personally and within their families).

CONCLUSION

The development of technology and information is currently developing rapidly, which certainly has an impact on the world of education. Innovation and paradigm of thinking about education are very important. Given that change is real. Of course this is expected to be able to provide change and be able to educate the nation's life, to create a generation that is intellectual and able to compete internationally. In the development of technology and information, if it is able to support and maximize the learning process in schools.

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