



**WORKSHOP AND OPEN DISCUSSION ON THE INDUSTRIAL REVOLUTION
4.0 AND THE FUTURE VIEW OF EDUCATION**

Oleh

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Abstract: *This Community Service (PkM) aims to provide insight to teachers and students of SMA Negeri 4 Pagar Alam about the industrial revolution 4.0 and share views on the future of Indonesian education through open discussions. The industrial revolution 4.0 referred to in this workshop activity includes the development of the industrial revolution itself, opportunities and challenges as well as a paradigm shift in education thanks to the birth of the industrial revolution 4.0. The implementation of this community service uses several methods, namely presentations and open discussions. Participants in this PkM activity are teachers and students of SMA Negeri 4 Pagar Alam. Through the workshops, participants gained insight into the industrial revolution 4.0 and the digitalization of all aspects of life, including the world of education. Through open discussions, participants get the opportunity to share their views on the future of education and how to optimize potential to become productive individuals in the era of the industrial revolution 4.0.*

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INTRODUCTION

Currently, the world is entering the era of the industrial revolution 4.0 where technology has become the basis of human life. Everything becomes limitless and unlimited due to the development of the internet and digital technology. According to (Halim, 2018) The concept of the industrial revolution 4.0 is a concept that was first introduced by Professor Klaus Schwab. He is a well-known economist from Germany, an initiator of the World Economic Forum (WEF) through his book *The Fourth Industrial Revolution*, he stated that the industrial revolution 4.0 can fundamentally change the way we live, work,

and relate to one another. Look at the following picture, the four stages of industrial evolution from the past to the present:

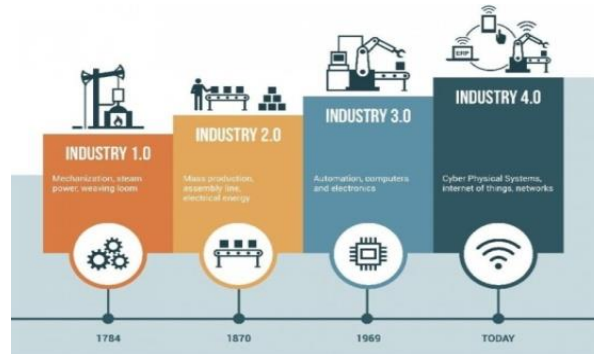


Fig 1. History of the Industrial Revolution

Source: <https://medium.com/@stevanihalim/revolution-industri-4-0-di-indonesia-c32ea95033da>

The industrial revolution 4.0 does not come without bringing new problems, one of the problems that may be caused by this revolution is the creation of unemployment which is influenced by widening economic inequality. Digitization can shift conventional roles in the market. Public transportation service actors such as; Base motorcycle taxis and public transportation have the opportunity to become unemployed due to the emergence of online transportation which is considered much more economical and efficient. Not only digitalization, in the future, the use of robotics in supporting the automation of the manufacturing and service industries is increasingly inevitable. This is driven by the company's desire to cut costs incurred by human resources. The demand for an increase in wages that is not accompanied by productivity is one of the problems that are often experienced by companies related to human resources, so that robotic technology seems to be the right solution to overcome the leakage of resource costs.

The development of technology sooner or later will affect the demand for labor in the future. Looking ahead, the demand for labor will shift. Industry will tend to choose middle and highly-skilled labor (middle and highly-skilled labor) over less-skilled labor (less-skilled labor) because their role in doing work can be replaced by robotic automation. Industry 4.0 requires workers who have skills in digital literacy, technological literacy, and human literacy. The world of work requires skilled workers in their fields and able to master the rapid advancement of technology and the acceleration of virtual information

The industrial revolution 4.0 gave birth to new challenges for the world of education, in this era the role of teachers in learning is juxtaposed with machine work. Machines or robots that are present are much smarter, faster, and more effective in the search for information and knowledge. Therefore, teachers need to change the way of teaching from traditional to multi-stimulant learning, so that learning is more fun and interesting. In addition to learning activities that must change, the role of the teacher has also changed, from being a giver of knowledge, to being a mentor, facilitator, motivator, inspiration, as well as a developer of imagination and creativity. Then, the teacher becomes a cultivator of character values and builds teamwork and social empathy.

The role of the teacher greatly determines the quality of Indonesian education, improving the quality and role of the teacher is very necessary, in connection with the importance of changing the educational paradigm thanks to the presence of digitalization

in all aspects of life, because education is considered the most valuable investment in the form of improving the quality of human resources for the development of a nation. This is intended to accelerate the growth of middle-level human resources who are ready to work, smart and competitive which will ultimately support national economic growth.

Law Number 20 of 2003 concerning the National Education System, Law Number 14 of 2005 concerning Teachers and Lecturers and Government Regulation Number 19 of 2005 concerning National Education Standards confirms that one of the elements of the Tri Dharma of Higher Education is Community Service (PkM).

Based on this background, the FKIP lecturer at PGRI Palembang University held workshops and open discussions about the industrial revolution 4.0 and the future view of education at SMA Negeri 4 Pagar Alam.

The aims of this activity are:

- a. Implementing the Tri Dharma of Higher Education
- b. Realizing the work program of the Accounting Education Study Program, Geography Education, and Indonesian Language Education FKIP Universitas PGRI Palembang.

Provide insight to teachers and students of SMA Negeri 4 Pagar Alam about the industrial revolution 4.0 and share views on the future of Indonesian education through open discussions.

IMPLEMENTATION METHOD

This Community Service (PkM) activity was held on Wednesday, March 6, 2019 starting at 08.30 WIB until 14.00 WIB, located at SMA Negeri 4 Pagar Alam Jln. Lt. Col. A. Rozak No. 89, Ulu Rurah, Kec. Pagar Alam Selatan, Pagar Alam City. The theme of this activity is "industrial revolution 4.0 and the future of education". The form of this PkM activity is in the form of presentations and open discussions.

The resource persons in this activity were lecturers in the FKIP PGRI Palembang University, totaling 10 people. The materials that are the object of the workshop and discussion in detail can be explained in the following table:

Table 1. Resource and Material

No	Name	Material
1	Susanti F.S. S.Pd., M.Pd	Industrial Revolution Background 4.0
2	Chandra Kurniawan, SE, M.Si	Challenges of the Industrial Revolution Era 4.0
3	Nova Pratiwi, M.Pd	Educational Opportunities and Future of the Industrial Revolution Era 4.0
4	Boby Agus Yusmiono, S.Sos,M.A	The Impact of the Industrial Revolution 4.0 in the world of Education
5	Neta Dian Lestari, S.Pd., M.M.	Strategies of Educators Entering the Industrial Revolution 4.0
6	Erma Yulaini, S.Pd, M.S	The Role of Education in the Era of the Industrial Revolution 4.0
7	Masnunah, M.Pd	Study and Learning in the Industrial Revolution Era 4.0
8	Januardi, S.Pd., M.Si	Preparing the Young Generation for the Industrial Revolution 4.0

9	Hendri Gunawan, S.Pd. M.Pd	The Role of Technology in Preparing the Young Generation for the Industrial Revolution 4.0
10	Diana Widhi Rachmawati, S.Ip., MM	The Role of Schools in Preparing the Young Generation for the Industrial Revolution4.0

RESULTS AND DISCUSSION

This community service activity carried out at SMA Negeri 4 Pagar Alam produced outputs in the form of booklets about the Industrial Revolution 4.0 and scientific articles. The module consists of 25 pages covering the background, opportunities and challenges of the Industrial Revolution 4.0, the impact of the Industrial Revolution 4.0 in the world of education and the preparation of the younger generation through education and schools to face the Industrial Revolution 4.0 Era.

The booklet on the Industrial Revolution 4.0 has been distributed to training participants as a guide for participating in community service activities carried out. Furthermore, this activity produces a scientific article that has been compiled by the implementing team based on the final report on the results of community service activities, which will then be submitted to the manager of the community service journal with ISSN.

The material prepared by the team in the booklet distributed to participants will be presented in turn by each responsible speaker. Before the presentation by the presenters began, the school opened the event by continuing with the introduction of the target school, namely SMA Negeri 4 Pagar Alam and the introduction of PGRI Palembang University and each of the presenters. Furthermore, the University of PGRI Palembang through one of the staff of the Institute for Research and Community Service (LPPKM) expressed the intent and purpose of community service activities as one of the Tri Dharma College activities.

The presentation activity by the lecturer team, opened with material and discussion about the Background of the Industrial Revolution 4.0, the history of the industrial revolution until it finally touched this 4th generation. The following are four stages of industrial evolution from the past to the present. (1) The end of the 18th century, the first Industrial Revolution 1.0 occurred at the end of the 18th century. Marked by the invention of the first mechanical loom in 1784. At that time, industry was introduced to mechanical production facilities using water and steam power. Work equipment that initially depended on human and animal labor was eventually replaced by these machines. Many people are unemployed but production is believed to have doubled. (2) The beginning of the 20th century, the Industrial Revolution 2.0 occurred at the beginning of the 20th century. At that time there was the introduction of mass production based on the division of labor. The first production line involved a slaughterhouse in Cincinnati in 1870. (3) The early 1970s, marked the beginning of the emergence of the 3.0 industrial revolution. Starting with the use of electronics and information technology to automate production. The debut of the third generation industrial revolution was marked by the appearance of the first programmable logic controller (PLC), namely the 084-969 modem. This computer-based automation system makes industrial machines no longer controlled by humans. The impact is that production costs are cheaper. (4) The industrial revolution 4.0 is marked by a cyber-physical system. Currently, the industry is starting to touch the virtual world, in the form of human, machine and data connectivity, all of which are already everywhere. This term is known as the internet of things. (Karney: 2015).

The challenges of the Industrial Revolution Era 4.0 are 1) information technology security issues; 2) reliability and stability of production machines; 3) lack of adequate skills; 4) reluctance to change by stakeholders; and 5) the loss of a lot of work due to turning into automation (Sung: 2017).

In the Educational Opportunities and Future of the Industrial Revolution Era 4.0, it discussed the Government's efforts to respond to the challenges of industry 4.0, the threat of unemployment, and the demographic bonus with a focus on improving the quality of human resources through vocational education in 2018. The government through cross-ministerial and institutional policies issued various policy. One of the government policies is revitalization, namely the revitalization of the learning system including, 1) curriculum and character education, 2) information and communication technology-based learning materials, 3) entrepreneurship, 4) alignment, and 5) evaluation. Educational units include, 1) new school units and new classrooms, 2) other study rooms, 3) classroom rehabilitation, 4) student and teacher dormitories, 5) equipment, and 6) school management and culture. Elements of students include, 1) awarding scholarships and 2) developing talents and interests. Elements of educators and education personnel include, 1) provision, 2) distribution, 3) qualifications, 4) certification, 5) training, 6) career and welfare, and 7) rewards and protection. Strengthening the four elements that exist in the education system requires a new movement to respond to the industrial era 4.0. One of the movements launched by the government is the new literacy movement as a reinforcement and even shifting the old literacy movement. The intended new literacy movement focuses on three main literacys, namely, 1) digital literacy, 2) technological literacy, and 3) human literacy (Aoun, 2017). Three skills that are predicted to be skills are needed in the future or in the industrial 4.0 era. Digital literacy is aimed at improving the ability to read, analyze, and use information in the digital world (Big Data), technological literacy is aimed at providing understanding and knowledge of the workings of machines and technology applications, and literacy, directed at improving communication skills and mastery of design science. (Aoun:2017). The new literacy provided is expected to create competitive graduates by perfecting the old literacy movement which only focuses on improving reading, writing, and math skills. The adaptation of the new literacy movement can be integrated by adjusting the curriculum and learning system in response to the industrial era 4.0. Learning response.

The impact of the Industrial Revolution 4.0 in the world of education on the role of educators, if the role of educators still maintains as a transmitter of knowledge, then they will lose their role along with technological developments and changes in learning methods. This condition must be overcome by increasing the competence of educators who support knowledge for exploration and creation through independent learning. The world of education must quickly improve so that educators can properly transfer knowledge about the industrial revolution 4.0, if educators can overcome this challenge it will have a good impact on students, the impact is the creation of quality human resources, which are produced by institutions that are managed systematically. professionals to produce excellent results. These all-new demands call for various breakthroughs in thinking, drafting concepts, and actions.

The Strategy of Educators Entering the Industrial Revolution 4.0 and the Role of Education in the Era of the Industrial Revolution 4.0, can be seen in the image below.



Fig 2. The Strategy of Educators in Entering and the Role of Education in the Industrial Revolution Era 4.0

Learning and Learning in the Era of the Industrial Revolution 4.0 and the Role of Technology in Preparing the Young Generation for the Industrial Revolution 4.0, explained in Figure 3.



Fig 3. Learning and Learning in the Era of the Industrial Revolution 4.0 and the Role of Technology in Preparing the Young Generation for the Industrial Revolution 4.0

Preparation of the Young Generation to Face the Industrial Revolution 4.0, explained that technology is very necessary to support the achievement of the success of the younger generation in the future.



Fig 4. Submission of material by the presenter

The Role of Schools in Preparing the Young Generation to Face the Industrial Revolution 4.0, looking far ahead using even the most sophisticated tools, but don't forget to point the binoculars at yourself lest we just "want" but have no will to do or we use sophisticated tools. However, after observing ourselves, it is possible that our will and abilities are the problem.

The expected impact of teachers and students increasingly understand the importance of preparation in the world of education in the face of the Industrial Revolution 4.0 era.



Fig 5. Photo Together

CONCLUSION

This community service is carried out and completed through actual procedures which are expected to contribute to science. This community service activity which was held on March 6, 2019 with the theme "Industrial Revolution 4.0 and the Future of Education can also improve and arouse a sense of professionalism of lecturers in the Accounting environment of the Faculty of Teacher Training and Education, PGRI Palembang University and increase the knowledge and understanding of students, especially teachers and students in SMK Negeri 4 Pagar Alam. It is hoped that this activity can continue to be carried out in a sustainable manner in order to provide knowledge and deepen the knowledge or understanding of teachers and students on how to create a meaningful and fun learning atmosphere.

ACKNOWLEDGMENT

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