Pengenalan Revolusi Pendidikan 4.0 Bagi Guru Bimbingan Konseling

Introduction to the 4.0 Education Revolution for Counseling Guidance Teachers

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Abstract

This community service activity is carried out to provide teachers with an understanding and ability to face the education era 4.0. Training is carried out by combining assignments, discussions, and reflections. The results can increase the knowledge and capacity of the teachers involved in the activity. The increase occurred quite significantly, based on the assessment that has been done. This service is carried out to provide increased understanding and ability in terms of developing constructivist concepts. From the evaluation results, further training is needed regarding the teacher's ability to utilize technology in learning, implement class changes, and use MOOCs in education. Furthermore, this training can also be carried out so that teachers can be more prepared to accept the changes in this educational revolution..

Keywords*—Education Era 4.0, Education Revolutions, Counseling Guidance, MOOC's*

1. INTRODUCTION

The industrial revolution in the current industrial era is a concept that can fundamentally change the order of people's lives, including behavior in education. This era also shifted the education paradigm into the age of education 4.0. In the age of society 5.0, the industry is starting to enter the virtual world through connectivity between humans, machines, and data, including the Internet of Things (IoT). In this era of society 5.0, mass and flexible production technology have also been introduced, where machines will operate independently or coordinate with humans in terms of controlling the production process by synchronizing processes and time, as well as unifying and adjusting production. One characteristic that is quite prominent in the era of society 5.0 is the application of artificial intelligence. [1]

The industrial revolution also had a significant impact on the world of education. The developments that have occurred have changed the way people think about the concept of education. Changes are not only in teaching but also in the perspective of the concept of education itself. Therefore, curriculum development must provide student abilities in various dimensions, including pedagogical measurements, life skills, and the ability to work together (as well as critical and creative thinking. Develop soft skills and transversal skills, as well as invisible skills - which are helpful in various real-world situations, such as intrapersonal, interpersonal, and social life skills, the ability to be a good citizen and think globally, and, have good information and media literacy. [2]

To face the era of society 5.0, several skills must be possessed by teachers and students, including the ability to know the development of the latest generation, from the period of baby

boomers with high birth rates from several generations to the millennial generation, where many transformations occurred in human civilization.[3]

The development of the times and technological advances have enormous potential in accelerating the educational transformation process, based on the latest technology. By optimizing the use of communication technology equipment and networks holistically, it is proven to be able to encourage the educational transformation process to become more efficient - without having to put aside the achievements for students. The Minister of Education, Culture, Research and Technology, Nadiem Makarim also appreciated the performance of the State Civil Apparatus (ASN) within the ministry for their hard work in presenting breakthroughs to be able to produce a more advanced quality of education. These breakthroughs include the launch of the Merdeka Learning platform - which combines teaching and learning services into one so that the distance between teachers and students becomes even closer. Through educational transformation, it turns out that it is enough to have a real impact on the world of education. [4]

Nadiem explained that currently more than 1.6 million teachers have used the Merdeka Learning platform, and have opened access to self-development. More than 3,500 learning communities for teachers have also begun to form, as well as more than 55 thousand self-study content. Furthermore, educational transformation must also participate in helping facilitate the self-development of students through the Independent Campus program. There are more than 2,700 industry partners are joining the Merdeka Campus with more than 43 thousand practitioners in this Merdeka Learning Program. The technological transformation of the education sector is the government's effort to overcome the learning crisis that has occurred and the impact of the pandemic which has hampered teaching and learning activities. By combining technology support and the education system, it is expected to be able to improve the quality of learning in Indonesia.[4]

The educational environment is a useful process for fostering human personality, providing skills, increasing self-potential, and also spiritual abilities to lead individuals to goals and ideals, namely obtaining a happy life as stated in Undang-Undang Nomor 20, the Year 2003 - where Education is a planned essential effort to develop the potential of students.[5]

Schools and teaching staff need to implement the curriculum set by the government. This curriculum is a reference so the learning process can be carried out effectively. The world of Education also needs to keep up with the times - with various revolutions in its development amid increasingly tense globalization. At a time when Education has managed to keep up with the changes that have taken place, from revolution 1.0 to revolution 4.0, technological developments have brought about the societal revolution 5.0, which integrates the flexible application of artificial intelligence (AI). [6][7]

The world of education as a sub-system of people's life needs to anticipate various innovations that exist in the world of education and those that occur in other areas of life. This is an effort to integrate to achieve an educational condition that is in line with the changes happening in society due to a series of technological innovations. Based on the problems stated above, this PkM tries to introduce teachers - what is the typical situation in this 4.0 education revolution? The goal is for teachers to understand and be able to anticipate changes that might occur soon.[8][9]

In the 21st century, students are expected to have at least six Basic Literacy competencies:

a. Literacy in reading and writing, namely knowledge and skills to read, write, search, browse, process, and understand information and be able to use it to analyze, respond, and use written texts in developing understanding and potential.
b. Numerical literacy, namely knowledge, and skills to acquire, interpret, use, and communicate various kinds of numbers and mathematical symbols in solving practical problems in various contexts of everyday life.
c. Scientific literacy, namely scientific knowledge and skills to be able to identify questions, acquire new knowledge, explain scientific phenomena, draw conclusions based on facts,

understand the characteristics of science, build awareness of how science and technology shape the natural, intellectual, and cultural environment.

d. Digital literacy, namely knowledge and skills to use digital media, communication tools, and networks in terms of finding, evaluating, using, creating information, and utilizing it in a healthy, wise, smart, careful, precise, and law-abiding manner.
e. Financial literacy, namely knowledge and skills to apply understanding of concepts and risks, skills, and motivation in order to make effective decisions in a financial context.
f. Cultural literacy, namely knowledge and skills in understanding and acting towards Indonesian culture as a national identity. Meanwhile, civic literacy is knowledge and skills in understanding rights and obligations as citizens.[10]

This PkM began with a webinar activity which was a collaboration of the Information Systems study program at Pembangunan Jaya University with MGMP Guru BK in the Depok and South Tangerang areas, last November 2021. A little discussion with MGMP members followed this. Continuing with training for teachers to get to know the characteristics of Education 4.0. Continuing with teacher training activities to welcome the era of education 4.0.[11][12]

The training is carried out online using several applications, such as Zoom for providing face-to-face material and explanations, Google Drive and Google Docs for sharing data and discussions, and LMS for several online learning activities for teachers.

2. IMPLEMENTATION METHOD

This PkM activity is carried out online because it is still a pandemic with restrictions on movement and offline activities. Actions using several online applications. For discussions and face-to-face, use the Zoom application. Google Drive and Google Docs are used for data sharing and discussions. Online learning activities use the LMS.

The methods used in this training are lectures, discussions, and online assignments. Lessons are given to equalizing the perceptions and basic knowledge of the participants, discussions are used as a forum for exchanging opinions with the participants, and assignments are provided so that participants can implement what they know and evaluate achievements. Before the activity started, participants were asked to fill out a questionnaire that described the extent of their understanding of learning practices in the education 4.0 era. After the training, questionnaires were again given to measure changes in performance obtained by the participants.

Figure 1. Maps of Depok

Education 4.0 is a program to support the realization of intelligent education through increasing and equalizing the quality of education, expanding access, and the relevance of utilizing technology in realizing world-class education to produce students who have at least four 21st century skills, namely, collaboration, communication, creative, critical thinking, referring to global competency standards in preparing young people to enter the realities of worldwide work and life in the 21st century. Participants were asked to provide an overview of their understanding of these four matters - before and after attending the training.

Participants are also expected to understand nine trends related to education in the era of society 5.0, namely:

a. Study asynchronously or at different times and places, according to the circumstances of each student. During a pandemic, LMS facilitates independent distance learning according to learning abilities and needs
b. Individual learning, where students will learn with adaptive learning tools according to their own abilities. This indicates that students are challenged with difficult tasks and questions after passing a certain degree of learning.
c. Free in determining how they learn, students can modify the learning process with the tools they feel are necessary for them. Students will study with different devices, programs and techniques based on their own preferences. At this level, the combination of face-to-face learning and blended learning, turning the classroom around and bringing their own learning tools forms an important terminology in this changing society 5.0.
d. Project-based learning, this shows that they have to learn how to apply their skills in the short term to various situations.
e. Field experience, field experience will be deepened through courses or exercises such as internships, street vendors, mentored projects, and collaborative projects. But currently Indonesia is still facing Covid-19 so field implementation can be done in shifts.

f. Data interpretation, students are required to have the skills to apply theoretical knowledge from numbers to numbers by using their skills to make conclusions based on logic and data trends.
g. Various assessments, measuring students' abilities through conventional assessment techniques such as question and answer when they carry out project activities in the field.
h. Student involvement, student opinions are considered in designing and updating the curriculum. Their input can help curriculum designers produce contemporary, up-to-date and high-value curricula.
i. Mentoring, accompaniment is the basis for student success, thus requiring teachers to become facilitators who will guide students through their learning process. [13]

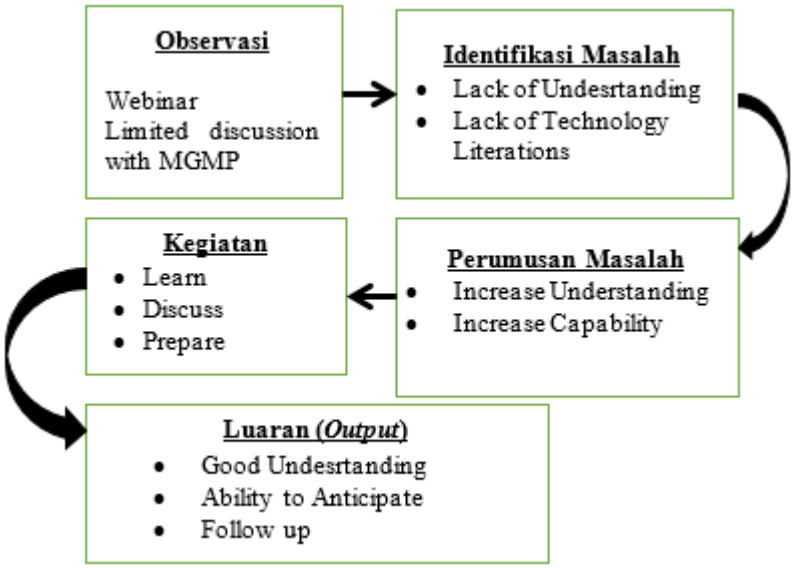

Figure 2. Problem Solving Framework

3. RESULT

Before the training started, the teachers were given a questionnaire and a test regarding their understanding of the aforementioned five goals. Further training is carried out, and then a reassessment is carried out after the training – to find out the impact of the activity. To increase the ability and understanding of the rubric concept in formative assessment, teachers are trained to make rubrics and apply assessment examples in the heading. Evaluation is based on headers made by each teacher according to their assignment.

For the placement of teachers as mentors and catalysts, teachers are given case studies in providing choices to students to determine their way of learning. The teacher gives a response based on the given simulated environment. Evaluation is based on the teacher's response to environmental conditions, where he must become a mentor and catalyst – based on predetermined circumstances.

The material presented included:

The development of the educational revolution

a. Education 1.0 is defined as a process of exploring basic science and knowledge, as the initial stage of the birth of new technologies.
b. Education 2.0 began to produce various kinds of technology.
c. Education 3.0 through the resulting tools are used to produce a lot of knowledge.
d. In the Education 4.0 era, during rapid information technology, INNOVATION PRODUCTION is very important, especially for the world of education.

Learning Paradigm

a. In this century, a paradigm in learning is needed by making changes or reforms in learning to find new, more effective ways of learning. This is where the demand for the role of teacher creativity is to find and implement innovative performance in improving the quality of education. This is a challenge that can be said to focus not only on what is taught but also on the way it is taught in which education itself is based on the need to meet the needs that exist in the future.
b. The world of education as a sub-system of people's life needs to respond openly to various innovations that exist in the world of education, as well as those that occur in other fields of life as an effort to integrate them so that an educational condition can be achieved that is not left behind by the changes that occur in society as a result of the accumulation of innovations. Referring to the problems stated above, the study of innovative learning entering the 4.0 education era is a demand in the world of education which is a must to always pay close attention to the changes that occur to face industry 4.0.

The constructivist concept in Education 4.0

The design of learning stages according to the abilities and interests/needs of each student based on Education 4.0, namely:

a. Using the rubric concept for formative assessment. the teacher helps students identify the abilities and talents of students.
b. Placing the teacher as a mentor and catalyst, the teacher can give students choices to determine their way of learning;
c. Accept the situation that students are different and are not expected to be the same;
d. Education is a goal, a process of transforming knowledge, not transferring knowledge.
e. Continuous professional development is important because teachers have central position in education.

Education that utilizes technology

a. Assignments and assessments are posted online
b. Group assignments completed using collaboration software – online
c. Assignments are done online, and uploaded to the class portal
d. Students use cloud storage (instead of paper or local storage)
e. Teachers, parents, administrative staff, and students – communicate through social media, both general and those devoted to education.

Class shape change - prediction

a. Drastic changes in classroom layout
b. Virtual and augmented reality will change classroom learning
c. Flexible assignments will be able to accommodate various forms of learning
d. MOOCs and online learning will be widely used in learning

The influence of technological developments in learning – from the teacher's side

a. Digital taxonomy
b. Hypertext system design
c. Electronic book or e-book
d. The use of LMS in learning administration
e. Presentation The use of multimedia in learning
f. How to assess rubric-based or using fuzzy logic

To improve and understand the abilities of students who are different and are not expected to be the same, teachers are asked to write essays regarding situations that have been or are being faced by teachers in the classes they teach. The evaluation is assessed by the practical ability of the teacher to accept the existing diversity based on the student's skills. The teacher must be able to respond (through his opinion) that the variety of students is a natural thing.

For the teacher's ability and understanding that education is the goal, the process of transforming knowledge - not the transfer of knowledge, the teacher is given a questionnaire that must be answered according to his views or opinions. Evaluation is carried out by assessing the teacher's ability to accept the situation that the students must transform knowledge into students. While the teacher only helps guide and direct the formation of this knowledge.

To increase teachers' understanding of the importance of continuing professional development, teachers are asked to answer several questions and write essays or writings about their views on the importance of professional development. Evaluation is carried out by assessing the teacher's affection for the need for continuous professional development.

Assessment for the pre-test and post-test uses a scale of 1 – 10, where one is very poor, and ten is very good. Table 1 depicts the pre-test and post-test results for the five compiled targets (based on several existing assessments).

Tabel 1. Pre-test and Post-test based on 5 target

Target	Pre-test	Post-test	Hasil
Target 1	5	9	+4
Target 2	4	9	+5
Target 3	3	8	+5
Target 4	5	9	+4
Target 5	7	9	+2
Rata-rata capaian	4.8	8.8	+4

Source: Processed from assessment results (primary data)

The results of target 1, with pre-test 5, indicate that the teacher is not familiar with the rubric assessment in the formative test to help identify students' abilities. After training, with post-test results of 9, teachers can assess rubrics and identify students' abilities (based on the headings used).

The results of target 2, with a pre-test score of 4, indicate that the teacher needs more time to be ready to position himself as a mentor and catalyst in learning. Teachers need to be used to giving freedom to students in determining how to learn. After the training, with a post-test result of 9, the teacher can accept the role of mentor and learning catalyst. The teacher has also admitted that students should have freedom in determining how they learn.

The results of target 3, with a pre-test score of 3, indicate that the teacher is not ready to accept that students are different (in many ways) and do not need to be required to be the same. After the training, with a post-test score of 8, teachers are more able to accept the fact that differences in abilities and backgrounds exist in students. And teachers do not need to force students to be the same.

The results of target 4, with a pre-test score of 5, show that teachers are beginning to realize that education is a process of transforming knowledge within students - and not a process of transferring knowledge from teacher to student. After the training, with post-test results of 9, the teacher already understands better that what is needed to happen is knowledge transformation, not knowledge transfer.

The results of target 5, with a pre-test score of 7, indicate that teachers can accept that continuous professional development is needed for teachers because of their essential role in learning. After the training, the results of post-test 9 show that teachers increasingly understand the importance of continuing professional development for teachers. So they can be appropriately involved in education in the current 4.0 era.

The average pre-test score of 4.8 shows that teachers are not ready for the characteristics of educational learning 4.0. Through several methods carried out in training, as well as several forms of evaluation, the results obtained an average post-test score of 8.8, which means that teachers can be better prepared to face the era of education 4.0. Teachers can improve their understanding and ability to meet the education era 4.0. Teachers can adapt and accept the changes in this educational revolution.

4. CONCLUSION

The results of this community service activity show that teachers' understanding and ability in dealing with the education era 4.0 must be improved. The training conducted (by combining assignments, discussions, and reflections) can increase the understanding and ability of the teachers involved in the activity. The increase occurred quite significantly, based on the assessment that has been done.

This PkM is only in terms of increasing understanding and ability to develop constructivist concepts. Further training is still needed regarding the ability of teachers to utilize technology in learning, implementing class changes, and using MOOCs in education. In the future, this training can also be carried out so that teachers can be more prepared to accept the changes that have occurred in this educational revolution..

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