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Will the Future Economics Teacher Be Prepared to Be up against Industrial Revolution 4.0?

Indra Febrianto and Ro'ufah Inayati

Faculty of Economics, Universitas Negeri Malang

Abstract

Today the Industrial Revolution has reached its peak where technology is the basis of human life. The Indonesian government has launched Making Indonesia 4.0 that grown massively. One sector that must be prepared in achieving Making Indonesia 4.0 is the Education Sector which can be done by improving the human resources quality. The readiness of Future Economics Teachers spearheaded the improvement of human resources quality. Therefore, it is necessary to conduct research that focuses on analyzing the readiness of Future Economics Teachers to face the Industrial Revolution 4.0. This study uses descriptive qualitative methods with a type of case study research. Primary data obtained from in-depth interview together with respondents and secondary data obtained from the document that shows the result of educational subject. Data collection is done by the method of observation, interview, and documentation that using source triangulation and method triangulation. The indicators used to analyze the readiness of these Future Economics Teachers are (1) Educational Competence, (2) Competence for Technological Commercialization, (3) Competence of Globalization, (4) Competence in the Future Strategies, and (5) Conselor Competence. Based on the results of this study, it can be concluded that; (1) Educational Competence possessed by Future Economics Teacher from the two ex-IKIP state university in East Java is sufficiently capable in dealing with the Industrial Revolution 4.0; (2) Competence for Technological Commercialization of the Future Economics Teachers is not too good to face the Industrial Revolution 4.0; (3) Competence of Globalization that is owned cannot be maximized in facing the Industrial Revolution 4.0;(4) Competence in the Future Strategy shows that this Future Economics Teacher does not have a definite strategy to predict what will happen in the Industrial Revolution 4.0; and (5) Conselor Competence shows good but still not enough to face the Industrial Revolution 4.0.

Keywords: Education Sector, Ex-IKIP State University, The Industrial Revolution 4.0, The Readiness of Future Economics Teachers.

Corresponding Author:
Indra Febrianto
indrafebrianto31@gmail.com

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1. Introduction

Today the world has reached the Industrial Revolution 4.0 where technology has become the basis of daily human life (Kemenristekdikti, 2018a). Indonesia as one of the countries with the largest population in the world also applies industry 4.0 called Making Indonesia 4.0. Today Making Indonesia 4.0 has developed more massively marked by the increasing of using Internet of things, big data, industries based on financial technology, the development of e-commerce and sharing economy. A real example of an industry that supports the achievement of Making Indonesia 4.0 is Go-Jek, Shopee, Lazada, Traveloka, Tokopedia, and I-grow. Industries that use high technology certainly have a big impact to achieve the main objective of Making Indonesia 4.0, namely to make Indonesia into the top 10 of the world economic power based on Gross Domestic Product (GDP).

One sectors that must be prepared in achieving Making Indonesia 4.0 is the education sector. Improvements in the education sector can be done by improving the human resources quality. Beside the education system that continues to be improved by the Indonesian government, another thing that can increase the contribution of education in the economy is the teacher. The teacher as the front guard in preparing millennial generations who have competence and competitiveness in the Industrial Revolution 4.0.

East Java as one of the provinces that has a reputable State University in Indonesia certainly produces the best graduates who will contribute to the development of national education. This is evidenced by the official data from the Ministry of Research, Technology and Higher Education in 2018 which shows that there are 4 State Universities in East Java that are included in the first cluster. Based on data from the Badan Pusat Statistik (BPS) East Java Province, there are 9 State Universities from the total State Universities in East Java, two of which are State Universities that have changed their names from Institut Keguruan dan Ilmu Pendidikan (IKIP) becomes a University. These State Universities are Universitas Negeri Malang (UM) and Universitas Negeri Surabaya (UNESA) which until now are still consistent in maintaining their identity as former IKIP's who create future professional teacher.

One of the departement at Universitas Negeri Malang and Universitas Negeri Surabaya is the Economics Education Departement. There have been many efforts made by the departement in the two State Universities to create qualified future

teacher in the era of Industrial Revolution 4.0. But from these efforts, **Will The Future Economics Teacher be Prepared to be up Against Industrial Revolution 4.0**

2. Literature Review

2.1. Quality of Education in Indonesia

Today the reality of the education quality in Indonesia cannot be said to be maximal. This can be seen from; first, access to education that is not evenly distributed. Secondly, the curriculum and program are still changing. Third, the competence of teacher and education staff has not been maximized. Fourth, education funding is still expensive. Fifth, educational facilities and infrastructure that do not meet standards. Sixth, manimum management of education. Seventh, education assessment that is not transparent.

2.2. The Industrial Revolution 4.0

In the book ”The Fourth Industrial Revolution” explains that the Industrial Revolution 4.0 has fundamentally changed human life and work. The Industrial Revolution 4.0 was different from the previous Industrial Revolution phase because in the Industrial Revolution 4.0 it had a wider scale, scope, and complexity. The technological advances that took place in the Industrial Revolution 4.0 integrate the physical, digital and biological worlds that affect all disciplines, economics, industry and government.

This phase was the culmination of the pre-existing phase of the Industrial Revolution which was marked by the existence of massive impact of internet technology that was directly related to millions of people throughout the world. Not only that, technology has also become the basis for online trade and transportation transactions and the emergence of the online transportation business.

2.3. Teacher Competence in The Era of Industrial Revolution 4.0

Indonesia’s success agains the Industrial Revolution 4.0 is also determined by the quality of teachers. Teachers are required to master expertise, ability to adapt to new technologies and global challenges. In this era of Industrial Revolution 4.0, teachers have at least 5 competencies which include; (1) educational competence, educational competence / internet-based learning as the basis of competency in the Industrial

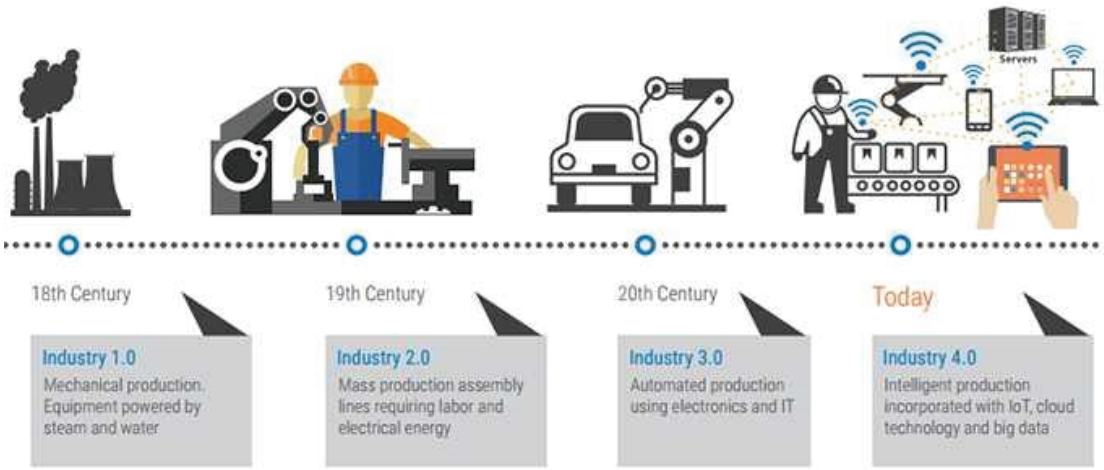

Figure 1: The Industrial Revolution 4.0 (Source: www.kompasiana.com).

Revolution era 4.0, (2) competence for technological commercialization, where teachers must be able to bring their students to have entrepreneurial attitudes with technology or innovative student work., (3) competence of globalization, teachers are required not to stutter on various cultures, hybrid competencies and excel in matching national problems that occur around them, (4) competence in the future strategies, teachers must have the competence to predict exactly what will occurs in the future and its strategy by means of join-lecture, join-research, join-resources, staff mobility and rotation, understanding direction, (5) counselor competence, with the development of this technology, students' problems are not only about difficulties in understanding material teach, but the problems of students have led to psychological problems, stress due to the pressure of this increasingly complex and severe situation, this is where the role of teachers is exactly needed.

3. Research Method

3.1. Research Design

This study aims to determine the readiness of Future Economics Teacher against the Industrial Revolution 4.0 and included in descriptive qualitative research. The type of research used by researchers is a case study using primary data and secondary data. The study was conducted at Universitas Negeri Malang and Universitas Negeri Surabaya which is an Ex-IKIP State University in East Java. Purposive sampling is a technique for selecting respondents conducted by researchers.

3.2. Data Collecting Method

The data collecting methods used by researchers in this study are as follows.

3.2.1. Observation

This observation aims to prove whether the results of interviews with research subjects are in accordance with the actual conditions in the field. Observations were carried out by researchers by making field notes that depicted the actual conditions during the study.

3.2.2. Interview

The researcher conducted in-depth interviews with the subjects of the study, namely Economics Education Study Program students as Future Economics Teachers at the Ex-IKIP State University in East Java. The researcher prepared the research instrument in the form of a list of questions which were then responded to by the subject and then made a transcript of the results of the interview by the researcher.

3.2.3. Documentation

The documentation is obtained from secondary data that has been obtained by researchers. Secondary data documented is a document related to the value of education and teacher courses that have been taken by the research subjects, namely students of Economic Education Study Program in the two Ex-IKIP State Universities in East Java?

3.3. Validity of The Funding Checking

The validity of the findings carried out by researchers using the trangulation technique. The triangulation technique carried out by the researcher was by source triangulation and method triangulation techniques. Source triangulation is done by checking the validity of the data obtained through the same method with different sources. While triangulation method is done by comparing the results of data obtained through other methods. The data obtained is then described and categorized as a conclusion.

4. Result and Discussion

4.1. Educational Competence

Educational competence that is owned by Future Economics Teacher from two Ex-IKIP State University in East Java is already sufficiently qualified against the Industrial Revolution 4.0. This can be explained by the following picture:

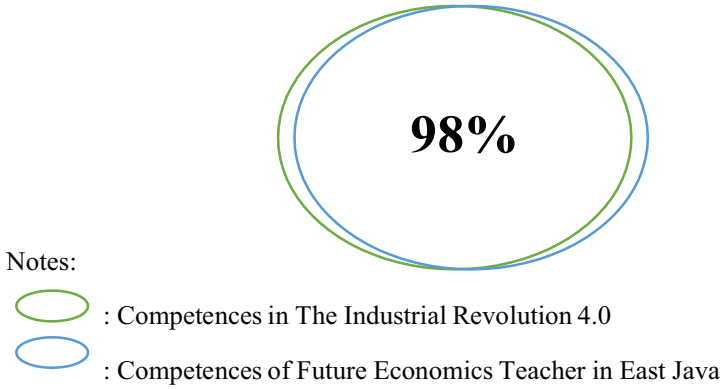

Figure 2: Education Competence Precentages (Source: Author's Own Work).

Huseno (2018) states that the educational competencies of future teachers in this era are learning based on internet of things. This competency is measured using four sub-indicators, first is learning planning where the learning planning made by the teacher is not only aimed at realizing the existing curriculum but must be able to improve the competitiveness of students with artificial machines that are growing rapidly now. Second is the preparation of learning strategies, in this phase require the future Economics teacher to develop their learning strategies that can improve students' competitiveness in this phase. This is in line with Permendiknas (2007) which states that learning must be computer-based. The third is the basic teaching ability, besides the eight teaching abilities revealed by Mulyasa (2016) Future Economics Teacher have higher demands to make their students competitive highly in this phase.

The last sub-indicator is evaluation of learning. Evaluation instruments that can be used by teachers are increasingly diverse by utilizing existing technological and internet developments. The instrument that used to be only a matter of paper, can be evolved into an internet of things-based assessment and big data instruments. Based on the explanation described by the author above, it can be concluded that this Future Economics Teacher from Ex- IKIP State University in East Java has good educational competence.

4.2. Competence for Technological Commercialization

Competence for technological commercialization that is owned by Future Economics Teacher is not too good against the Industrial Revolution 4.0. This can be explained from the following picture:

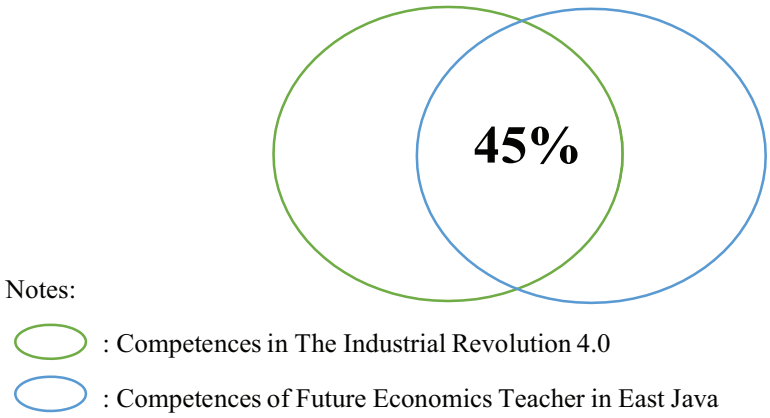

Figure 3: Comperence for Technologcal Commercialization Precentages (Source: Author's Own Work).

Competence for technological commercialization is measured using two indicators, the first is ICT literacy which is one of the basic skills that must be owned by workers in the phase of Industrial Revolution 4.0 (World Economic Forum, 2016). Not only clever in arranging learning plans to evaluating learning, teachers must also be literate in technology that will be collaborated with the learning tools they have planned. Based on the exposure of the data obtained, the author can take the meaning that the existing Future Economics Teacher still do not have a technology-based entrepreneurship attitude. The use of social media is an important thing that can be used to foster this attitude (Datta et al, 2005). Social media not only functions as a communication media, but social media is also a form of entrepreneurship.

The second is management of material resources which is one of the cross functional skills in the phase of Industrial Revolution 4.0 (World Economic Forum, 2016). In this phase requires the teacher to educate students to be able to compete with the machines in the future. In preparing this, the ability to utilize existing resources is the main thing that teachers must have in the present. Many universities have subscribed to reputable online journals (Situmorang, 2012). Future Economics teachers must certainly take advantage of this opportunity during the learning process.

Based on exposure to the data, the author can take the meaning that there is an increase in the quality of Future Economics Teacher in the preparation of the learning media used. But the interesting thing that concerns the researchers is that not all

teachers have good management of material resources. Conventional methods are still a favorite of these prospective teachers in dealing with their problems, there are also many concrete examples that illustrate the inaccuracy of resource use by existing teachers. Internet-based learning is indeed a demand in this phase of the Industrial Revolution 4.0, but it does not mean eliminating the duties and responsiility of teachers as facilitators of students in the classroom. The existence of teachers in the classroom is absolutely needed by students during learning. Learning will take place effectively if the facilitator understands the responsibility that are directly coupled with sophisticated machines.

4.3. Competence of Globalization

Competence of globalization which is owned by Future Economics teacher cannot be said to be maximum against the Industrial Revolution 4.0 that has taken place now. This can be explained from the following picture:

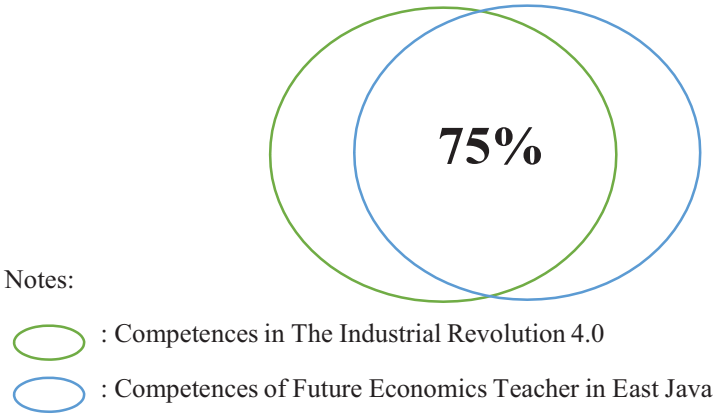

Figure 4: Competence of Globalization Precentages (Source: Author's Own Work).

This indicator is measured by using two sub indicators, first is complex problem solving which is included in the cross function skills in the phase of Industrial Revolution 4.0 (World Economic Forum, 2016). This can illustrate the problem solving strategies carried out by Future Economics Teachers. Based on the exposure of the data, it was shown that the problem solving strategies carried out by the Future Economics Teacher in the Ex-IKIP State University in East Java were not in line with the problem solving strategies that needed to be carried out in the Industrial Revolution 4.0 (Huseno, 2018). Determining the right attitude or positioning must also be understood by the teacher in this phase of the Industrial Revolution because the teacher as the stakeholder

interacts directly with the main figures of education namely students, so it is important to understand the right positioning in solving existing problems.

Second is active learning which becomes the basic skill in this phase (World Economic Forum, 2016). Based on the exposure of the data, it was shown that the Future Economics Teacher in the two Ex-IKIP Sate University in East Java did not have the initiative to learn continue and update the development of their current knowledge. Their understanding of the Industrial Revolution 4.0 phase is needed exactly in learning with students. Preparation of learning plans, learning media, and evaluation of learning must be adapted to the development of this phase to improve the effectiveness of learning in school. Student learning needs in the Industrial Revolution 4.0 phase are no longer a matter of basic concepts of economic theory, but a more complex understanding of the implementation of the theories taught in the environment around them. An environment full of machines with artificial intelligence that cannot be treated the same as conventional methods that are usually done by most people. This implementation strategy needs to be taught by Future Economics Teachers to their students during the learning process.

4.4. Competence in The Future Strategies

Based on the exposure of the data shows that the Future Economics Teachers does not have a definite strategy to predict what will happen in the future through join-lecture, join research, and staff mobility. This can be explained by the following picture:

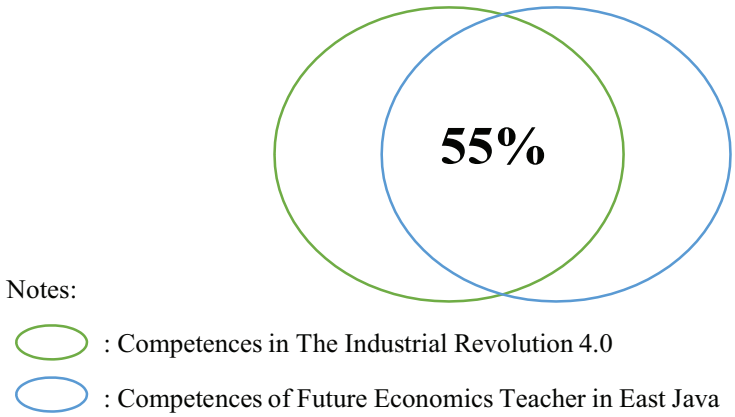

Figure 5: Competence in The Future Strategies Precentages (Source: Author's Own Work).

This competency can be seen by using two sub-indicators, the first is coordinating with others which describes the strategies of Future Economics Teachers in coordinating with the surrounding environment. This competency goes into social skills in the phase

of Industrial Revolution 4.0 (World Economic Forum, 2016). The join lecturer, joint research, and staff mobility strategies absolutely need to be done by this diffase Future Economics

Teacher to create students who have high competitiveness. The formation of a super team also needs to be done by this Economics teacher. It is undeniable that in line with technological developments, there are more types of work that must be completed by teachers at school. The formation of this super team will be very helpful for teachers in completing their responsibilities at school which will also minimize teacher absence during learning in class.

The second sub indicator is decision making. Permendiknas in 2007 explained that teachers must have personality competencies in themselves and one aspect that exists in this personality competency is wise. In line with the development of the Industrial Revolution 4.0, teachers' responsibilities are increasingly developing where technological decision making is an absolute thing that must be considered by teachers to be able to improve the competitiveness of their students. Sub indicator decision making is one of the abilities in the corss function skills needed against the Industrial Revolution 4.0 (World Economid Forum, 2016).

The development of business based on internet of things, big data, and sharing economic will give problems more to the teachers if they do not take into technological developments. The education sector which provides a considerable contribution in national development is also inseparable from new problems that come in line with the development of Industrial Revolution 4.0. This is the basic reason why teachers must have good decision making, considering that teachers are directly involved with students during school so that the teacher's activity and contribution is absolutely necessary in overcoming new problems in this phase of the Industrial Revolution 4.0.

4.5. Conselor Competence

Based on the exposure of the data, it was shown that Future Economics Teachers had good conselor competence but were not enough against the Industrial Revolution 4.0. This can be explained from the following picture:

This competency can be illustrated by using three sub-indicators, the first indicators is child growth levels that represent the teacher's responsibility to understand the development characteristics of each student he teaches in class (Permendiknas, 2007). In line with the development of technology, it often makes students develop unnaturally.

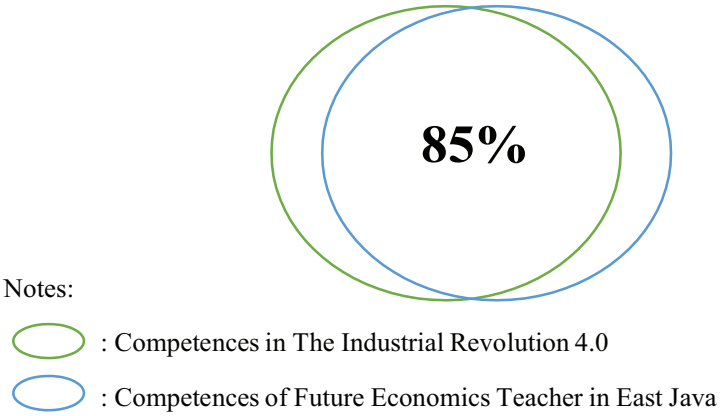

Figure 6: Conselor Competence Precentages (Source: Author's Own Work).

The influence of the internet, social media and the environment that is increasingly boundless is what leads students to always follow trends or lifestyles that are not in accordance with their age and environment. This is where the teacher's task is to understand the characteristics of each student collaborated with the phenomenon.

The second sub indicator is the service orientation. This sub indicator becomes one of the important things in cross functional skills that teachers need to have in facing the Industrial Revolution 4.0 (World Economic Froum, 2016). The teacher as well as parents of students during school and become the main stakeholder who have responsible to overcome the problems of students at school. Departing from this, a teacher must have a high service orientation. Not only active to improve their cognitive competencies, but also active to sharpen their social sensitivity to students and the surrounding environment. In the Industrial Revolution 4.0, service orientation is not only related to students, but more complex related to educational institutions and the world of education in general. Teachers as one of the main roles in improving the quality of education sector that must actively contribute to shaping innovative strategies in the Indonesian education sector.

The third sub indicator is emotional intelligence, which is one of the important types of social skills included in the cross functional skills needed against the Industrial Revolution 4.0 (World Economic Forum, 2016). Emotional intelligence possessed by the teacher will determine the actions what they will take in order to service the development of the Indonesian education sector. In line with the Industrial Revolution 4.0 problems in the education sector are increasingly complex which requires teachers to train their patience and sincerity in serving in the education sector. Not only controlling emotions themself, a teacher in the industrial revolution is also required to be able to control the emotions of the people who are around them.

5. Closing

5.1. Conclusion

Based on the discussion above, the author can conclude that:

a. Educational competence that is owned by the Future Economics Teacher from the two Ex-IKIP Sate University in East Java has been quite capable of dealing with the Industrial Revolution 4.0.

b. Competence for technological commercialization that is owned by the Future Economics Teacher from the two Ex-IKIP Sate University in East Java has not been too good against the Industrial Revolution 4.0.

c. Competence of Golobalization which is owned by the Future Economics Teacher from the two Ex-IKIP Sate

University in East Java has not been maximized against the Industrial Revolution 4.0.

d. Based on competence in the future strategy shows that the Future Economics Teacher from the two Ex-IKIP Sate University in East Java do not have a definite strategy in predicting what will happen in the Industrial Revolution 4.0.

e. The competence counselors owned by the Future Economics Teacher from the two Ex-IKIP State University in East Java are quite good but still not enough against the Industrial Revolution 4.0.

5.2. Suggestion

a. The Ministry of Education and Culture is expected to be able to improve the criteria for Economics teacher acceptance qualifications according to the Industrial Revolution 4.0.

b. The Ministry of Research, Technology and Higher Education is expected to create a platform for recapitulating the development of the quality of each Future Economics Teacher in Higher Education.

c. Future Economics Teachers are expected to continue to carry out scientific updates through joint research and updated information in the phase of Industrial Revolution 4.0.

d. Future Economics Teachers are expected to be able to use social media for commercial activities such as viral marketing.

e. The Department of Economic Development UM and UNESA are expected to conduct a review of the graduation criteria required in each course taken by Future Economics Teachers.

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