Original Research Article

The Role of Higher Education Institutions in Improving the Quality of the Graduates: Universities towards Industrial Revolution 4.0

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Abstract: This study employed a phenomenological approach of a qualitative research design. For this study, the researcher interviewed Human Resources Department leaders in national private companies in Jakarta and foreign companies or international bodies to gain information about the quality of university graduates in Indonesia.The researcher also interviewed chancellors of private tertiary institutions to gather information about what efforts the university is making in order to prepare qualified scholars to fit the demands of IR 4.0. In order to make this research more objective, the researcher also interviewed students from private tertiary institutions to explore information about their experiences in attending university and whether there were special courses or programs given by the university in order to improve student competency. The research proved that higher education instituition plays a significant role in improving the quality of the university graduates in facing the Industrial Revolution 4.0. Further analysis indicated that there was a gap between higher education outcomes and the demands of competence in the world of work. There are still universities which haven't implemented the program even though the curriculum has been modified and up to the present time, most of universities are still prioritizing hard skills compared to the students' soft skill. This study provides insights on the importance of higher institutions institutions to improve the quality of the graduates to face the Industrial Revolution 4.0, discusses the advantages and disadvantages of having and not having soft skills competencies in the global era and offers recommendations for future research.

Keywords: Quality of the university graduates, Industrial Revolution 4.0. Hard skills and Sift skills.

INTRODUCTION

Human capital management is an incorporated push to oversee and create human abilities to accomplish altogether abnormal state of performance. Human capital management hones are a set of practices that are sees individuals as resources whose present esteem can be estimated and whose future can be upgraded through venture. Gartner [1] affirms that human capital is an arrangement of practices identified with individual assets management, particularly in the classifications of workforce securing, management and advancement. The employees offer organizations with experience and mastery, instructive capabilities and word related skills. Employee information and abilities are the huge underlying foundations of advancement [2].

The quality of human resources is an important component in every movement of development. Only from high quality human resources can accelerate the nation's development. Large population, if not followed by adequate quality, will only become a burden of development. Quality of population is the condition of the population both individually and in groups based on the level of progress that has been achieved. The low quality of Indonesian human resources is also caused by the low quality of education. Although school participation rates have grown significantly, student learning outcomes are still below the level of other countries in the region; thereby it is reducing Indonesia's competitiveness in the global economy. The World Bank argues that during the 15 years of education reform in Indonesia, there has not been an effective impact on improving education outcomes and human capital.

To spur competitiveness, Indonesia needs to do more education reform. What needs to be underlined, in this frame of competitiveness, we cannot carry out higher education in the way and quality that we have done so far to answer future challenges, because the quality we achieved yesterday was very different from the quality we must achieve tomorrow at a different pace of achievement. Based on

the 2018 World Bank report on the Human Capital Index (Human Capital Index), Indonesia scored 0.53, ranked 87th out of 157 countries, under the Philippines (rank 82, score 0.55), Thailand (ranked 68 , 0.60), Malaysia (ranked 57, score 0.62), and also Vietnam (ranked 48, score 0.67), while Singapore ranked first with a score of 0.88.

Improving the quality of the workforce is not easy, given Indonesia's population of 261.1 million in 2016. In February 2014 the Central Statistics Agency (BPS) noted that 118.2 million Indonesians worked in Indonesia, highly educated workers were only 12 million with details 3, 1 million vocational diploma Program education or 2.65 percent and 8.8 million higher ducation or 7.49 percent. Population with education level that dominates is elementary school education with a workforce of 55.3 million people or 46.8 percent, followed by junior high school education with 21.1 million people or 17.82 percent.

Based on data published by the APINDO [3], the Permit for Employing Foreign Workers (IMTA) averaged 71,776 Foreign Workers (TKA) who worked in Indonesia. As of November 2016 there were 74,183 foreign workers, an increase of 7.5 percent from the end of 2015 which was 69,025 foreign workers. Many foreign professionals are still retained and employed in Indonesia to occupy certain positions, especially in large companies whose scale and orientation are international in scope. The People's Republic of China, South Korea, India, Malaysia, the Philippines, the United States, Australia and Thailand still dominate the total number of foreign workers who work in Indonesia. Korea is the second largest after the People's Republic of China where in the January-November 2016 period reached 12,490 or around 16.8% of the total foreign workers in Indonesia. Seeing the data and facts that occur with employment in Indonesia, the government, business people and Indonesian workers must prepare the quality and professionalism of the domestic workforce to face challenges and opportunities in order to compete with other countries.

To tackle the human capital crisis, all relevant parties must involve in the retraining and upskilling of the employees to enhance their readiness to combat increase in unemployment and shortage of talent [4]. There will be many changes in employment patterns and demands on employee in job qualification with a new generation of employees that born in the era of communication technologies with skills such as communication, technical literacy, learning ability and creativity [5]. Therefore, the aim of this research is to get an overview of what the current weaknesses of Indonesian Bachelor are and how universities strive to improve the quality of their graduates towards the Industrial Revolution 4.0.

LITERATURE REVIEW

Industrial Revolution 4.0 and the Impact on Human Resources

Wolter et al., [6] believe that one of the effects brought about by industry 4.0 is the change in the structure of occupational fields. They believe that it will results in job reduction or cut in the manufacturing sector, job switching and improvement or change in qualifications. Consequently, it means that the adoption of new technologies associated with Industry 4.0 may pose some potential negative challenges or to a certain extent result in negative outcomes such as future unemployment if what is required are not met. The emergence of the use of these new technologies as related to industry 4.0 and according to Wolter et al., [6] will bring some structural changes (challenges) to the labour market. Accordingly, it will create some jobs and some will be lost within occupational fields. Soon, it seems industry 4.0 may be creating unemployment and increase competitiveness.

The rationale is that the digitals, Internet of Things and Networked Systems have eradicated some or most of the tasks, the worker currently performs [7]. This may require the ability to look at a person's own task perspective taking into account the bigger picture of the society as a whole (the challenges, resource scarcity, opportunities and wealth). In addition, opportunities for a person's own development and the commitment to lifelong learning, Human resources management must adapt to new challenges, like change of professions as we know them today. Human role within the company changes and transition can only be done successfully with proper education [8]. The applied technologies include interconnected IoT (Internet of Things), collaboration of services and people, better communication standards, decentralized decision, applications of Cyber Physical Systems (CPS), Augmented Reality (AR), Artificial Intelligence (AI), information transparency with cyber security, Big Data Analysis, advanced robots, additive manufacturing, sensors and digital twin simulation models [9].

According to Trstenjak [10] higher level of human knowledge will be essential. It lies in new technologies, mathematical models and innovative approaches to problem solving and decision -making process. The current educational system and professions aren't appropriate to adjust in the way needed for the new requirements of fourth industrial (r) evolution. In the organisation context, human capital is encompassing a set of education, experience, knowledge and skills that are possessed and utilized by employees to generate value to ensure the firm's success [11]. According to the report by [12], today's workers are not necessarily lack skills but the new workplace requires skills that they don't have although it is agreed that the smart manufacturing would not only abolish jobs but also to create new opportunities [13]. This new opportunities however most probably will demand for workers which are high skilled, innovative and dynamic [14], with preference of the employees with high IT competence that have good understanding of practical, engineering and programming skills [13, 12].

The World Economic Forum's study [15] forecasted that 5 million jobs will be lost before 2020 as human capital will be replaced with artificial intelligence (AI), robotics, nanotechnology and other socio-economic factors. However, some 2.1 million new jobs in more specialized areas such as engineering, mathematics, computing and architecture will be created and workers who successfully combine mathematical and interpersonal skills in the knowledge-based economies of the future should find many rewarding and lucrative opportunities [16]. Therefore, radical changes in educational system are needed. The changes must be done in every aspect of educational system, most

radically even in the beginning stage of human education. Emphasis should be made on the practical use of theoretical knowledge presented, creation of innovative and opened for changed mindset [10] as illustrated in Figure-1 below.
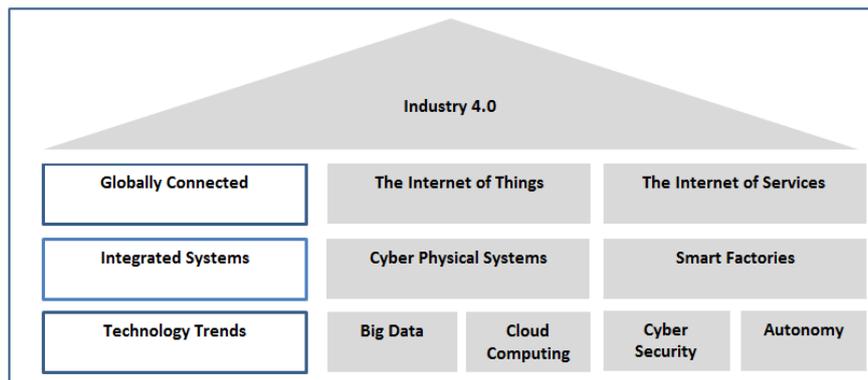

Fig-1: Changes towards Industrial Revolution 4.0
Source: Flynn, Dance & Schaefer (2017)

Quality of university graduates in Indonesia

Towards the 21st century the world of higher education faces quite serious challenges in its development. The end of the 21st century marked by the swift flow of globalization has led to knowledge becoming a dominant superior product and having significant learning in society. The society embodied by this phenomenon is a knowledge society, namely a society based on information and having the ability to access and process the information in an creative [17].

The issue of higher education is now being discussed by academics in Indonesia. Various efforts are underway to overcome the problem of degradation in the quality of education in general. These efforts include a variety of training for teaching staff (lecturers) and improvements in educational elements such as curriculum and physical facilities and infrastructure including libraries and laboratories, all of which are then focused on achieving quality assurance to respond to global challenges.

Problems commonly encountered in various parts of the world related to the quality of college graduates as stated by Bailey and Bennet [18] related to skills problems such as the ability to communicate well both verbally and in writing, analytical skills are still lacking, problem solving is still lacking, leadership is lacking lack and ability to work in teams. Meanwhile Santoso [19] tried to identify the quality of university graduates in Indonesia, which generally involved issues: Character of students with normative crises that affected the discipline and work ethic, Lecturer Character, which was caused by many Indonesian lecturers who were not practitioners and thus did not understand the world of work, curriculum-related problems that do not match the demands of the world of work today, and finally the lack of quality management education.

Some shifts in terms of competence in the world of work that occur today include the dynamics of the relationship between higher education and the world of work. Teichler Observations [20, 21]; Yorke and Knight [22] are mainly related to the gap between higher education outcomes and the demands of competence in the world of work. Some important shifts that occur include the occurrence an increase in educated unemployment both open and covert unemployment as a result of the massification of tertiary education, changes in the global socio-economic and political structure that affect the labor market and the rapid development of science and technology so as to cause fundamental changes in terms of qualifications, competencies, and requirements for entering the workforce.

Based on macro data shows that in Indonesia there is currently a tendency to open more massively and more profit-oriented Higher Education Institutions (PT) without being followed by the provision of adequate and quality infrastructure, so that the number of graduates continues to increase. On the other hand, productive employment opportunities in Indonesia are also limited, so the unemployed educated are relatively high. The gap between the demand and the availability of educated workers is also supported by ILO data [23] about workers who do not meet educational qualifications and skills whose proportion reaches more than half.

According to Hill and Kian Wie in Jones [24], that tertiary institutions in Indonesia have grown rapidly and even their growth is considered the fastest in the world. Nevertheless, the massive growth in the number of tertiary institutions was not followed by adequate quality improvements. To fulfill the needs of the workforce, there are actually a number of policies and programs, including high quality and internationally competitive tertiary education services through five main programs, namely improving access, improving quality, increasing relevance, competitiveness and improving governance [1].

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[1]Renstra Kemendikbud-Dirjen Dikti 2010-2014.

The relevance between graduate competencies and the demand of global era

The development towards mass higher education has led to a growing concern about several aspects of quality, including the relevance of higher education for the job market. As a consequence of the rapid growth, graduates have found occupation outside the job markets that the universities traditionally prepared for. Even if graduates get employment, there remains the question of how well they are prepared to conduct the work-tasks [25]. Some shifts in terms of competence in the world of work that occur today include the dynamics of the relationship between higher education and the world of work. Teichler Observations [20, 21]; Yorke and Knight [22] are mainly related to the gap between higher education outcomes and the demands of competence in the world of work.

To achieve the standard quality of education, it is not only the educational staff, namely lecturers, but how the management of the tertiary institution is based on standards of content, process, competence of graduates, facilities and infrastructure, management, financing, and education assessment, which can be carried out by a standardization body, guarantee and control the quality of education (Article 35 paragraph 3 of RI Law Number 20 of 2003).

Manpower needs in the global era are the supply and demand of labor in an area or country that is affected by the global situation because the world is connected, accompanied by an increase in demand for skilled labor and the transition to a knowledge-based economy. The relevance of tertiary institutions to their workforce needs is seen in terms of quantity (quantity) and quality (qualifications, namely the level or level of education and the field / department of education).

The results of predictions by the McKinsey Global Institute (MGI) in 2017 shows that in 2030, the demand for semi-skilled workers especially skilled workers in the global market will be very high. It is projected that the demand for undergraduate educated workers in 2030 has more than tripled from 2010, while the semi-skilled workforce with secondary school qualifications has almost doubled in 2030. In addition, it is also estimated that by 2030 the service sector will require 90 percent of the semi-skilled and skilled workforce, compared to the industrial sector which only requires around 80 percent and the agricultural sector to only 40 percent of the semi-skilled and skilled workforce.

Based on the various analyzes above, there is a mismatch between skills based on the type of work and the highest education completed, and the unemployment rate of young people with higher education is not merely caused by the lack of relevance of college graduates and the need for labor in the global era. There are other influential factors including the relatively low wages offered on the one hand and on the other, there is a relatively high "reservation wage" for job seekers. Reservation wages are wage rates expected from job seekers that influence the choice to get a job. Brown and Taylor [26] explain that a job seeker who has a large human capital investment tends to have high job aspirations, which results in a high reservation wage, making it difficult for them to find work in the job market. Thus, the higher the education, the higher the reservation wage, so the possibility of getting a job is smaller.

Several countries have long emphasized the development of skilled people through education and training, in recognition of the positive link between human capital and economic growth, productivity, and ultimately innovation (Organisation for Economic Cooperation and Development (OECD) [27, 28]. Within this regard, the role of the university as an economic and social institution has become increasingly important [29-31] and the analysis of higher education quality a central issue in policy making.

In February 2017, open unemployment has 606,939 undergraduate degrees and an Academy or 249,705 people with a Diploma. According to the World Bank Survey [32], Unemployment in Indonesia is caused by: skills mismatch for the quality of graduates and their relevance to the needs of the labor market, the disparity in the quality of education in tertiary institutions that affects the quality of graduates. The problem is the mismatch between graduates and the needs of the world of work will cause unemployment, namely structured unemployment because the supply of labor exceeds the needs and frictional unemployment.

Higher education is directed towards achieving economic growth by encouraging graduates to create jobs through entrepreneurship to overcome structured unemployment, addressing the challenges of workforce needs through the suitability of the competency, number, and location of education graduates to overcome frictional unemployment. The involvement of students and campus life is considered important because it supports the development of critical thinking skills, the ability to solve problems, the ability to work in teams, and the ability to communicate effectively. Research and Technology of Higher Education in 2017 issued a strategy so that students are able to compete in the global era as can be seen in Figure-2 below.
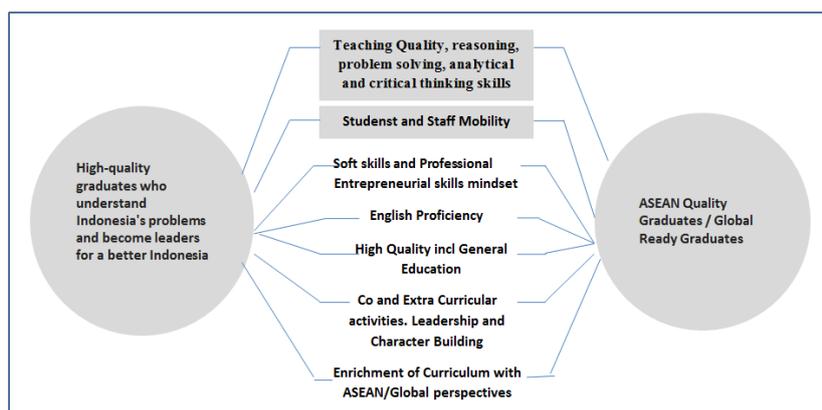
Fig-2: Strategies for students to be able to compete in the global era
Source: Ristek Dikti 2017

RESEARCH METHODS

In this research, a qualitative research method is applied. the purpose of qualitative research is not formulating general statements but exploring specific social contexts to achieve better understanding of specified social settings Patton [33] as quoted in Crabtree & Miller [34]. That is why the qualitative sample is selected purposefully and case study approach was adopted in this research.

In this study, a phenomenological approach is employed. Creswell [35] argues that a phenomenological study "describes the meaning for several individuals of their lived experiences of a concept or a phenomenon" (p. 57). In other words, it focuses on describing a phenomenon that all the participants have experienced, such as learning a second language in a school system. According to Creswell [35] the purpose of the phenomenological method is to "reduce individual experiences with a phenomenon to a description of the universal essence". To achieve this goal, a researcher will usually identify a phenomenon for study.

The types of data required in this study include primary data and secondary data. Data collection takes place through in-depth interviews and multiple interviews [35]. Other forms of data, collected through observation or reviews of journals and art, can be included as well [35]. The interviews lasted for 45 minutes to 1 hour for every participant and we used semi structured interview since it can direct the interview more closely, to have a pre-determined set of questions while simultaneously allowing the interviewees sufficient flexibility to shape the flow of information given [36]. During an interview, an investigator may ask very general questions. The data were collected from interview and documentation techniques. Robson [37] also says that it is appropriate to use the interview when the individual perceptions of processes within a social unit are to be studied and the interviewer can ask more questions, if the answer does not come up to expectations. Therefore, the researcher believes that the phenomenological approach is suitable for this research.

For this study, the researcher interviewed a total of 18 people consisting of 5 Human Resources Department leaders in national private companies in Jakarta and 5 Human Resource Department leaders from foreign companies or international bodies to gain information about the quality of university graduates in Indonesia. The researcher also interviewed 3 chancellors of private tertiary institutions to gather information about what efforts the university is making in order to prepare qualified scholars to fit the demands of IR 4.0. In order to make this research more objective, the researcher also interviewed 5 students from private tertiary institutions to explore information about their experiences in attending university and whether there were special courses or programs given by the university in order to improve student competency.

RESEARCH FINDINGS AND DISCUSSION

From the interviews with 5 HRD directors at national private companies, the researcher obtained the data that the abilities of university graduates in Indonesia today are generally related to soft skills issues. While pertaining to hard skills or technical work training related matters are usually provided by the companies, and in a short time they can do it well. However, when talking about soft skills, this concerns character because in it there are elements of communication, leadership, teamwork, motivation, all of which will affect their performance.

"So at this time, we are actually not pessimistic about the ability of Indonesian fresh graduates' hard skills, but more worried about their soft skills. Moreover, if they follow the development of the Industrial Revolution 4.0 which demands very specific and skilled personnel related to technology, how they compete if they have no motivation."

In addition, fresh graduates from domestic universities generally lack high leadership skills. All can be seen from how he solved the problem in his division or group. Though this is very needed in the world of work, an exception occurs if the fresh graduates when they were students were quite active in organizational activities. Usually those who are active in organizations or social activities

are far more able to lead and have better communication skills. That is why when we recruit fresh graduates, we prefer those who have a track record in their CV as an organization. This is in line with what was stated by Bailet and Bennet [18]. Even now what is needed is how an employee can combine his hard skills with his soft skills as confirmed by Caruso [16]:

"……..workers who successfully combine mathematical and interpersonal skills in the knowledge-based economies of the future should find many rewarding and lucrative opportunities" [16].

Meanwhile, from interviews conducted with 5 HRD leaders in foreign companies, I got data that shows there is a mismatch between higher education outcomes and competency demands in the world of work.

"Of the Indonesian employees who work at our company, only a few of them can work under pressure, even though this company needs tough people not just those who master technology. Indonesian employees are actually smart. If we conduct training related to new technology, they can be mastered in a short amount of time, but everything related to character factors cannot immediately change after they take part in the training. It takes a long time. This is where we see a gap between higher education outcomes and the demands of competence in the world of work. If there is such intense competition, only tough people can survive and thrive."

This is consistent with what was said by Teichler [20, 21]; Yorke and Knight [22]. of the 5 HRD leaders interviewed, all agreed that the soft skills problem was the main problem faced by university graduates in Indonesia, especially communication skills. This causes them to be less able to work together in teams so that they often have difficulty in solving existing problems. This is also in line with what was said by Bailey and Bennet [18] related to skills issues such as the ability to communicate well both verbally and in writing, analytical skills that are still lacking, problem solving that is still lacking, lack of leadership and the ability to work in teams. In general, fresh graduates only think that by having a high GPA, they can easily be accepted to work and get good positions and salaries. In fact, the reality is not like that.

Meanwhile, the 3 highest university leaders interviewed generally said that to achieve the standard quality of education it was not only the educational staff, namely lecturers, but how the management of the tertiary institution was based on content, process, graduate competencies, facilities and infrastructure, management, funding, and education assessment, which can be carried out by an education standardization, guarantee and quality control body. This has been stated in Article 35 paragraph 3 of RI Law Number 20 Year 2003.

Only problems in the field are not as smooth as what we think. For example, related to lecturers. Many lecturers in Indonesia are not practitioners and thus do not understand the world of work. You can imagine how they would tell what happened in the field if they only taught daily and did not experience for themselves what is currently the complaint of many parties. When asked why they did not recruit more practitioner lecturers, the three leaders said that it was very difficult to recruit lecturers to become permanent staff given that they were still actively working in the company. But for now, what can be done is to recruit them to be part-time staff at the university. We have done this to overcome the current 'link and match' problem of education and the world of work. This is also consistent with what was stated by Santoso [19].

While interviews with 5 students from universities in Jakarta, only 2 people said that currently their campuses have done things that are preparations for students so that if they graduate later they are ready to compete in IR 4.0, including some current courses have been modified, such as Entrepreneurship courses, which were originally only in class, now students must work in groups practicing how to start a business that really has to prioritize Creative Thinking. In addition, another subject such as leadership, which is usually only studied in the classroom is now begun to change by doing various social projects that must be done by students off campus. By doing real assignments, students have experience how to solve problems in the real life, how to communicate with friends so that when it is time for them to enter the workforce, they already have these skills.

While the 3 students interviewed said that until now they had not seen any differences in the lecture system since they were in the early semester until the final semester. At present there is only a provision that 7th semester students must have an internship at a company or government agency, but the campus also does not prepare what students need before an internship. Therefore, many of them are not ready so they do not know how to behave and communicate with the guests at the company and also with the employees there.

In addition, other difficulties are still related to mental readiness, students are also not equipped with work motivation guidance or teamwork and matters related to interpersonal communication, so it seems that the campus is only implementing regulations to require students to be apprenticed but there is no preparation and guidance to work. The university thinks that they have carried out their duties by giving all the required courses but still have not thought about how to prepare their students so that when they are apprenticed they can be independent, have leadership skills, can communicate well and can work in teams. The things above must be a concern of higher education at this time.

CONCLUSION

From the findings described above, it is seen that there are still many universities which have not implemented the programs for quality improvement of the graduates to face the Industrial Revoluion 4.0. More universities in Indonesia only emphasize on the hard skills competence for the students and not on the soft skills. Fresh graduates from domestic universities generally lack of leadership skills. All can be seen from the way they solved the problems in their work place. University students are also not given a motivation or guidance to enter into the work wold by the lecturers. Therefore, efforts should be made if we want our graduates to be able to compete in the digital era. For future research, the researcher recommends to dig deeper the issues on the Higher Education programs to prepare students to face the Industrial Revolution 4.0 with different approaches to be adopted.

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