

# TURNITIN PREPARING HIGHER EDUCATION GRADUATES FOR THE FOURTH INDUSTRIAL REVO LUTION

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### PREPARING HIGHER EDUCATION GRADUATES FOR THE FOURTH INDUSTRIAL REVOLUTION: NARROWING DOWN THE GAP THROUGH EXTRACURRICULAR ACTIVITIES

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#### 2 ABSTRACT:

The relationship between higher education and the world of work has been discussed for the past few decades, in terms of, among others, contribution of higher education to the labour market, in the form of manpower supply. The market requires that higher education graduates fulfill certain competencies and in fact they are considered more important in the recruitment process than the degree itself. In Industrial Revolution 4.0 which is characterized by trends such as *Internet of Things, robotics, virtual reality (VR) and artificial intelligence (AI)*, the way people live and work has changed and because many jobs are predicted to be lost due to, among others, automation, it is important that higher education institutions comprehend the changing nature of the work and map the labour market condition. With the challenge of the 4th Industrial Revolution, it is of utmost necessity to prepare students during their study time, 3-4-year period. This paper discuss the importance of mapping the labour market for the purpose of preparing students to enter the labour market and equipping them with competencies for the 4.0 industrial revolution and other changes and adjustment to the dynamic labour market. Secondly this paper will discuss the importance of extracurricular activities in higher education level. It is true that work competencies are mostly gained outside the classrooms, where students deal with real work situation. When designed carefully, extracurricular activities become very effective to gain certain competencies that are important for the working life.

#### INTRODUCTION

The fourth industrial revolution is changing the world around us. Artificial intelligence (AI), robotics, big data and the internet of things will combine to impact on jobs and industry. However, the 21st century's intellectually intensive jobs will be impacted just as much as those manual activities that were changed forever by the industrial revolution of the 19th century (Anon n.d.). The world has entered the 4th industrial revolution era. Whether we like it or not, the impact of the coming of the era has startled the people due to the many changes it brought. Manual activities that are now replaced by internet and robots, for example. Available jobs are no longer those that can be handled because of lack

of competencies that are required to carry out the responsibilities. The 4.0 era has also changed the way people think of jobs and job opportunities because many jobs no longer exist.

A question, however, arises, when many jobs are no longer available, what will happen to the many study programs whose graduates were used to fill the jobs? This will definitely force higher education institutions to revisit their programs. This is a huge challenge for institutions of higher education--the so called producers of manpower. The communities believe that higher education will help them in getting a job. Quality Assurance Agency (QAA) which explored UK students' expectations and perceptions, concerning the quality of their learning experience, between the years 2012 and 2013, found that the main purpose of entering higher education was to improve their career prospects and also for career enhancement. For this purpose, students expected institutions to offer advice and guidance to support them. The degree was indeed important but they need to go beyond it to gain the skills and experience they would need for employment. (Quality Assurance Agency 2015).

Mapping the labour market is also important in the design of program. The government policy of higher education curriculum design in Indonesia governs tracer study of the graduates and employers survey be used as the initial step. This is important because institutions must first map what is required from the graduates by the labour market. It is true that degrees are important in the recruitment process or in getting the job, but it is employability that keep it (Brennan and Little 1996).

With different kinds of competencies required of higher education graduates in order to survive in the labour market, it is about time that institutions pay attention not only to curriculum but also other activities that would support the performance of academic achievements (Qureshi et al. 2020). Higher education institutions must try so hard to design curriculum which matches to the requirement of the labour market, like a competence based curriculum. Challenges might differ, for instance, in developing countries, higher education institutions try hard to meet the expectation of the industries (Kouwenhoven 2010). The changing skills which are relevant to the demand of the labour market in a certain era must be trained, otherwise graduates will not be able to compete.

The 4th industrial era is here. Many advancements which started with invention of electricity, has changed the world. Consequences of the advancements, be they positive or negative are welcomed. Now, with the fast shifting from one industrial era to another, we see vast changing in many sectors, therefore we must start to prepare to cope for the change. Higher education's role as provider of knowledge actually prepare students for their future, which is sometimes unpredictable. The challenge, however, is getting higher due to advancement of technology which seems to make higher education is left far behind if it does not make any adjustment to its curriculum.

In this 4th industrial era, competencies that students are inquired to possess are those which can cope with the characteristics of the era. The top skills of the year 2020 by the Asian Economic Review 2016 have been revealed, i.e. complex problem solving, critical thinking, creativity, people management, coordinating with others, emotional intelligence, judgement and decision making, service

orientation, negotiation, and cognitive flexibility. The first skill, complex problem solving, is the highest amongst the others. This shows that for the current situation where the number of manual works have decreased drastically, a high cognitive skill is needed. Something that is not easily replaced by robots. Therefore, higher education institutions, the providers of manpower should consider its role. Although relationships between competencies and employment is not clear, there is a discrepancy between competencies which are gained during study and those required by employment (García-Aracil en Van Der Velden 2008).

### HIGHER EDUCATION IN INDONESIA WELCOMING THE 4TH INDUSTRIAL ERA

Since 2012, Indonesia has implemented outcome-based education where its curriculum is based on the Indonesian Qualification Framework (Anon 2012). For a *Sarjana* (bachelor) degree program (level 6 qualification), the IQF has stated that the holders of the Sarjana degrees, aside from possessing certain moral and ethical qualifications which indicate that the holders carry Indonesian values and acknowledge the state principle of Pancasila, they must possess the followings:

1. Capable to apply science, technology and art within her/his expertise and adaptable to various situations faced during solving a problem.
2. Mastering in-depth general and specific theoretical concepts of a certain knowledge and capable to formulate related problem solving procedure.
3. Capable to take strategic decision based on information and data analysis and provides direction in choosing several alternative solutions.
4. Capable to take strategic decision based on information and data analysis and provides direction in choosing several alternative solutions.

Before discussing further about how higher education in Indonesia welcomes the 4th. industrial revolution, let us first see the challenge that higher education face in their effort to produce graduates that meet the expectation of the users or community at large. Higher education institutions carried a noble role as knowledge provider, the place where communities learn and gained certain knowledge. However, the role of higher education institutions have become the producers of competent labour. A much more complicated responsibility since the community's expectation is getting higher. With the 'investment' they make, they will expects something in return, good job opportunity, for example.

Indonesian higher education has so far given attention to quality improvement. The continuous quality improvement in the input-process-output-outcome process of education forced institutions to give attention to the graduates' activities after study time. Before the implementation of outcome based education, Indonesian higher education gave more weight on the output, i.e. the number of graduates. Now the community expected higher education institutions educate their children so they can find jobs after the learning process is completed, with the diploma they earned.

The curriculum is based on the outcome of education. Outcome itself is defined as a final result of a process; it is the benefit of a process and it may be expected or not expected but it will surely the final effect. For Indonesian case, the smooth transition from education to the world of work is considered a good outcome. OECD reports that transition time is between 15 and 29 years old (Report 2017)

Measuring outcome of an education is not easy since it may require a series of research to check whether the graduates (with the diploma which states what competencies that the graduates possess—output) can survive in the next phase: work places (the place where they practice their competencies)

Following the dawn of the fourth era, the hot issue of the future of work have been discussed since it is feared that due to the characteristics of this era, many jobs will disappear and be change by robotic system. Works that deals with rountinity such as accounting, will easily be replaced by a computing software which works automatically. Many manual works will also be replaced changed by automatization. The increasing use of robots in developed countries will reduce labor-cost. In other words, lower price of the product or service is guaranteed. If many jobs that used to exist in the past no longer exist, what will? Securing the future by preparing students with skills needed to deal with the changing demand is the answer. Skills which will likely be accepted to survive in the 4th era. What additional role(s) that higher education must take in order to guarantee that the graduates are well accepted in any situation that any era will require?

#### **CURRICULUM FOR COMPETENCY ACQUISITION?**

From the above, we can conclude that the challenge that higher education faces will not stop with the 4th industrial revolution era. The next era is on its way and more new challenges are waiting ahead, therefore it is imporant that higher education prepare their students in any way that make them ready for the next phase, the after education life.

Indonesian higher education is governed by regulations and decrees as the basis of education in Indonesia for its more than 4500 institutions. For example, the graduates of undergraduate degree, as stated in the IQF Level 6 must possess certain qualifications as the basis of the learning outcome in the program. Related to the knowlege and skills, there are certain keywords that graduates must possess problem solving skills, adaptability, ability to formulate, and responsibility. In Ministerial Decree Number 73/2013 about Implementation of IQF in Higher Education dictates (1) kinds and level of education, (2) quality leverage of the graduates, (3) curriculum development, (4) Development of Quality Assurance System, (5) Facilitating the long life education (Anon 2013). In addition to that, Ministerial decree number 49/2014 point 5 (1) on Higher Education National Standard states that the minimum competency standard of graduates cover attitude, knowledge and skills which are formularized in the learning outcomes of the progam, therefore each study program must design its curriculum according to this standard and optimize the use of learning facilities and resource to assure that the learning outcomes are achieved (Ministry of Education and Culture 2014).

The two regulations have celarly indicated that higher education has to design a curriculum of a study program which focuses not only on the study program specific outcomes but also other outcomes that will help them in practicing their expertise. Therefore learning outcome in the curriculum has to clear and measurable. In designing the curriculum, study program must get enough foundation, both from internal and external. With the internal factor, which is the vision of the study program and the external factor, which is information from the graduates and users of the graduates (industries and society), the profile of

the graduates is formularize. This is the first step of the curriculum development. The next is the defining the learning outcomes that will help study program design learning activities for students to achieve specific knowledge, skills and attitude (or competencies).

### **EXTRACURRICULAR ACTIVITIES TO ENHANCE LEARNING OUTCOMES**

Extracurricular programs are generally defined as activities which are done outside the classroom, as opposed to curricular which are comprehended as activities inside the classrooms. Extracurricular activities are considered as equally important as curricular program. Studies prove that extracurricular activities help students develop certain skills which are important for work. Although a study argues that no clear definition as to what is defined as curricular activities (Bartkus et al. 2012). To achieve certain skills, extracurricular activities have been proven to be the vehicle because when designed carefully, these activities will become very effective for students to gain certain competencies. With the growing demand of competencies, higher education institutions should look at required competencies they way the industries do. For instance, what employers look in candidates are rarely seen by higher education institutions. As the impact of AI and disruptive technology, those who can perform tasks that machines cannot are becoming more valuable. (Frankiewicz, Tomas Chamorro-Premuzic 2019)

Extracurricular activities can lead to a positive impact on participating students' academic achievements. The effect that extracurricular activities have on students is multifaceted in their benefits even beyond the classroom. Hattie (2008) pointed out that higher engagement rates lead to a significant positive effect on student achievement. (Shamsudin et al. 2014)

Extracurricular activities (ECAs) are defined as activities that students take alongside with their curricular activities during studies. Classroom activities are believed to be insufficient to provide real experience. The classroom learning are to the best of my knowledge provides more on subject knowledge, the softskills attained in classroom is somehow limited although various learning methods are used, such as, seminar where students are encouraged to write their scientific paper and present it, group work where students have the opportunity to work together for a certain purpose, brainstorming, role play, field trip, and many others that will provide them with competencies.

In addition to the above, extracurricular activities should also be designed carefully. The World Economic Forum of 2016 specifically list skills needed in 2020: complex problem solving, critical thinking, creativity, people management, coordination with others as the top 5 of the list. These competencies, without no doubt are seen as characteristics of competent and employable graduates. (Allen, Ramaekers, en van der Velden 2005)

Extracurricular activities offer a powerful resource for personal development and in acquiring social competencies. In extracurricular activities, students are trained to work in a close to reality experience and help them visualize the real work in the future. They are known to students as activities that they take outside classrooms, without credit units but they are compulsory. Therefore they are associated with sports or other outside classroom experiences, such as Student Government (Student Council), publication, clubs, debating team, internships,

volunteer work, and many others. They mostly attract students because they do not expect students to learn from textbooks. More often than not, students do not realize that outside classroom activities enrich students with experience, increase their skills, and, this is very important, give them advantage to learn about the real world they are dealing after they complete their studies.

For Indonesia, the multicultural country with many ethnicities and religions, a competence of appreciative of other religions or way of life is also a good addition. A simple example of extracurricular activity that is useful for students in many social events that are packaged with simple organization for small gatherings. Since Indonesia observe 5 different religious holidays and each requires a celebration, students can learn how to organize the events and at the same time celebrate the big day, for example. A small group of students can actually form a small organizing committee to celebrate an occasion associated with a religious event. This work in the small organizing committee help them understand the real work setting. The successful event relies on their teamwork, where the process of communication, administration, decision making and others take place. The process and an success of the program do not always be granted by a grade but this eventually give students experience they will need for their career later in the future.

### CONCLUSION

Advancement of technology has to a certain extent changed the way we look at the work and how it has reduced the number and types of job, therefore it is of utmost importance that higher education institutions regularly update the dynamic labour market in order to keep track of the world of work before revisiting its curriculum. The challenge ahead must be responded by preparing students with certain skills that are necessary to compete in the labour market.

Although some studies mentioned that meaning of extracurricular has not been defined clearly, it is obvious that extracurricular activities are vehicles to expand and develop one's skills that will be useful for the future work. Extracurricular activities, usually done outside classrooms, have distinctive characteristics compared to the curricular. While the former allows students to explore far more beyond his/her subjects or study programs, the later has to stick to the curriculum that has to be completed in due time. Many soft skills are acquired in extracurricular activities which serve as their 'laboratory' because students may experience work-like atmosphere, such as, interaction with people, meeting deadlines, or designing a project, which in turn enhance their communication skill, negotiation skill, tolerance, leadership, and working under pressure.

In designing extracurricular programs, institutions need invite stakeholders to help them in deciding and prioritizing certain skills for future work. Information on employability is also valuable because with it, institutions can focus on development of employability skills, looking for opportunities in the effort of shaping the graduates.

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