TECHNOLOGY EMPOWERED STUDENTS "PREPARE YOURSELF FOR INTERCONNECTED WORLD"

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Abstrak— Perkembangan pesat teknologi digital telah mengubah keterampilan yang dibutuhkan dalam pekerjaan. Universitas, tanpa pertanyaan, melakukan upaya untuk berubah dalam menghadapi tantangan di era revolusi industri 4.0. Pada bagian pertama makalah ini, perubahan cepat teknologi, menyoroti perubahan cepat dalam industri dan pendidikan, dibahas bersama dengan pertumbuhan inovasi yang eksponensial. Kehadiran Kecerdasan Buatan yang telah mengubah pekerjaan dan keterampilan yang dibutuhkan dalam industri dan bidang lainnya dibahas di bagian kedua. Bagian terakhir dari makalah ini, beberapa tips tentang bagaimana menghadapi perubahan teknologi yang cepat dan bagaimana untuk terus belajar di luar dinding kelas dibahas.

Kata Kunci— Perkembangan pesat teknologi, revolusi industri 4.0, Kecerdasan Artifisial

Abstract— *Rapid development of digital technology has changed the skills required in the job. Universities are, without question, making attempts to change in facing the challenges in the era of industrial revolution 4.0. In the first part of this paper, the rapid changing of the technology, highlighting the rapid change in industry and education, is discussed along with the exponential growth of innovations. The Presence of Artificial Intelligence that has changed jobs and skills required in the industries and other areas are addressed in the second part. The last section of this paper, some tips on how to face the rapid changes of technology and how to continue learning beyond the classroom wall are discussed.*

Keywords— *Rapid Change of Technology, Industrial Revolution 4.0, Artificial Intelligent*

INTRODUCTION

The current rapid advancement of technologies provides everyone with many new skills and, at the same time, changes the ways people live human beings live, study, work, and have interaction with others, as Schwab (2017) signifies that the new industrial revolution with its —fusion of applied sciences across the physical, digital, and biological worlds motives shifts not only throughout all industries, however also toward society, and reshapes governments, institutions, structures of education, and many others. This industrial era requires human beings to have innovative insight, collaborative group work, and adaptivity toward way of life differences, such as intercultural and interpersonal skills (Penprase,2018).

In the framework of education, especially in the teaching and learning, this circumstance shows that instructors have to develop interactive varieties of pedagogy and put emphasizes on multiple disciplinaries and cultural perspectives, in order to cultivate students' capacities and skills. It appears that self-directed learning and thinking must be well-developed due to the fact applied sciences are exponentially developed and require humans to update their abilities and train themselves about the latest applied sciences and industries continuously. It is in line with what

Wheelers (2013) suggests about pedagogy [education] that ―Pedagogy is leading humans to a place where they can learn for themselves. It is about creating environments and situations where people can draw out from inside themselves, and improve the abilities they already have, to create their own knowledge, interpret the world in their very own special ways, and eventually realize their full attainable as human being. The fast increase of technological innovations and industries deliver amazing impacts on education in Indonesia. Schwab (2017) signifies that the era of schooling pushed by way of the industrial revolution 4.0 was known as Education 4.0. Education 4.0 is education which responds to the requirements of Industry 4.0 the place smart machines work alongside with human-professionals, makes use of the potentials of digital technologies, personalised data, open sourced contents, and the globally-connected, technology fueled world of humanity, and establishes lifelong learning to grow and survive even to play a better role in the society (Fisk, 2017).

Digital learning process in the technology of Industrial Revolution 4.0 demands curriculum reorientation, hybrid / blended learning, and life-long learning (Ahmad, 2018). It urges faculties and universities in Indonesia to be adaptable toward technological development and be in a position to use it, as properly as to build a lifelong learning, in view that it helps college students facing and adapting the future changes. Furthermore, longstanding literacies covering reading, writing, and arithmetic are not enough for living in the society. New literacies are wished as property to come upon the technology of Industrial Revolution 4.0. Aoun (2017) proposes three new literacies i.e. information literacy, technological literacy, and human literacy, which prepares students to compete in a labor market in which smart machines work alongside human. Students are expected to have the competencies of reading, analyzing, and using facts (big data) in the digital world—it is referred to as information literacy; students also have technological literacy, and apprehend how machines works, and technological applications, such as coding, Artificial Intelligent (AI), and engineering principles; and human literacy - the humanities, communication, and layout – need to be mastered by means of college students to function as a human being. Human literacy is necessary to survive in this era, the purpose is so that college students can function well in their environments and societies. This circumstance shows the need for change in the field of teaching and learning. Schools and universities are expected to boost statistics literacy, technological literacy, and human literacy. Within the industrial revolution 4.0, students are anticipated to be geared up with literacies which make them survive in the rapid growth of science and technologies.

Regarding to the speedy boom of technology and science in the context of education in Industrial revolution 4.0, instructors appear to have many roles towards the successfulness of the students

in learning, because they can equip students with capacities for living and working within the quick changes of technologies and industries (Aoun, 2017). Fullan (1993) additionally suggests that teaching is to prepare college students for real world in the future and bring about meaningful change, by striving to be better at managing the changes itself. This implies that an instructor is an agent of exchange needed by way of the students to grow and live on within the revolution. According to Pullias and Young (1977), being a teacher makes a man or woman become many things and may additionally become a predominant component which affect the future. It seems important to look at the changing world of technology.

THE CHANGING WORLD

This digital revolution in any manner is one step ahead to make the world a better place. It all began in 1960's with the development of technology from manual and parallel to the digitized structure. The most important outcome is "globalization" which has led to powerful and effective enterprise productivity. After the Internet developed, it was a disruptive, game- changing power for some industries. The digital revolution has frequently been referred to as the 4th industrial revolution and means that difference from linear machine and electronic application to digital engineering (Schwab, K. 2017). The digital revolution is both the reflection and consequence of the growth of data communication technologies. This change implies mass production and wide spread usage of digital system- that is the computer, global network, and cellular telephone. The digital revolution has established the new era of human management and participation across commerce, community, school system and at every aspect of our lives. Never before has there been a stronger effect on human behavior, regardless of region or society, than the one effect of digital technologies. The consequences of the change on society are enormous and dramatically changing our position responsibilities whether in governments, professionals in business, teachers in education (CIO exchange Guest., Feb. 2017).

The effect of digital technologies can be seen in the rapid change in the area of music and film industry (Day, B. 2011). In 2011for example, general uses of magnetic storage media existed for machine information mass memory on hard disk and this recording of analogue audio and video works on analogue recording. Since at that time more of music and television industry is going to digital systems, the use of hard disks is expected to increase at the cost of analog recording. Digital recording libraries are common for the high-power data storage of collections and backups. Additionally, manipulating digital sound is extremely simple and faster than it was with the older methods. At those early many years of the 2000s, this music business experienced exceptional changes with the presence of disseminated computerized music arrangement by means of the Internet which included both illegal record sharing of tunes

and legitimate music buys in online stores. The unmistakable file of there changes is in general music deals: since 2000, offers of recorded music get fallen of well (the Economist. Oct 15, 2008) while living music has expanded in values (Seabrook, holy person, Aug 10, 2009). In 2011, the biggest recorded music wholesaler at this globe was today the advanced, Internet-based stage worked by a PC organization: Apple Inc's. online iTunes Store. To put it plainly, the music and film industry has changed the human administration, devices and advertising.

In line with the industries, the online education offers some new opportunities and resources to students and teachers. Online education provides resources focusing on learning academic concepts, e.g., establishing theorems or solving equations. Take an example of language learning, there are many courses offered online for free, such as https://www.britishcouncil.org/english/learn-online, http://www.breakingnewsenglish.com/, http://teachingkidsnews.com/ and many others. Similarly in the area of science, there are some online simulations for free such as https://phet.colorado.edu/, https://www.csun.edu/science/software/simulations/simulations.html, http://onlinelabs.in/biology, https://www.weareteachers.com/10-interactive-science-simulations-2/ and many more. In the past, it was impossible to access learning and teaching materials as fast as today.

Other than accessible resources, the internet provides authoring tools for teachers to create interactive teaching materials. For example, TED-Ed (https://ed.ted.com/) a popular site among university students and teachers. TED-Ed is an educational structure that provides producing educational lessons with the cooperation of teachers, students, animators – generally people who need to grow knowledge and better thoughts. The site provides democratizing access to data, both for teachers and students. In the site, the structure has an open source interface that allows producing and distributing informative materials through the internet, which can be altered including pictures, audios and interactive exercises. Other popular sites are PlayPosit (https://www.playposit.com/) and EdPuzzle (https://edpuzzle.com/). These sites provide teachers to make interactive videos. Teachers can show the screencast or leverage existing videos, and embed questions in important points in the video to monitor students' understanding. These are ideal instruments for enabling students to watch and draw in with recordings while instructor gather information all through the exercise. With regards to 21st century learning, as educators fiddle into the flipped classroom reasoning, EdPuzzle is the ideal upgrade apparatus for recordings to be watched at home as opposed to taking important class time. EdPuzzle enables instructors to take a video from Youtube, Khan Academy, Learn Zillion, and some

more sites. From the examples above, it can be seen that the industries of video for education has changed from providing books along with the video to free authoring tools which gives teachers freedom to create activities for learning both in the classroom and outside classroom. In short, the changes from analog to digital have changed the industries, schools and universities and our daily live.

THE EXPONENTIAL CHANGES AND ARTIFICIAL INTELLIGENT (AI)

From the above illustration, the changes are exponential. Technology is progressing faster than always, faster than human need to initiate, swifter than the changes themselves. With the exponential development in the field where 1) everything can remain related to the internet 2.0 artificial intelligence can move everything 3) every organization is growing into the technology; take an example of China and India. China is leaping ahead in the AI race on many levels (research, investment and government policies). India is only waking up to this AI hour (Cendrowski, S., Oct. 2016) Academics, researchers, government and individual investors have to realize this possibility of AI for India's development. The practices and concepts associated with the new industrial change, in this case the revolution industry 4.0, have shifted along with it. Technology is progressing in such a fast rate that in 2020, almost 5 million jobs would be replaced by automated machines (Morison, N., Feb. 2017) Self- driving cars can gradually popular, artificial intelligence (AI) would shortly make conclusions for us. AI will eventually enter the day to day life and they are in the form of Apps in our mobile phones. Siri (iOs) for example, is a digital assistant (just like chatbots) that is able to apprehend voice queries, give relevant answers to user's questions, ship messages and make calls. Looks relatively like a voice chatbot, doesn't it? In addition, Siri is capable to deal with your gadget settings, navigate areas, time table meetings, set up reminders and engage with other applications. So, Siri is really a clever pocket assistant that performs duties that are usually performed with the aid of humans. Robin (Android), the Siri Challenger, is a personal assistant for Android terminals, which just like the noted Siri, will enable us to speak with our mobile phone through voice orders. In this way, we will be in a position to use our cellular phone to ask it immediately if it knows a place to have coffee or the place the nearest restaurant is. If we do this, the application will show us the route with the GPS on the screen. In a similar way, we will be able to tell the phones microphone that we want to know what the weather´s like or in a particular city and it will show us records on the weather. Robin, the Siri Challenger is a private assistant but it is only in English whereas Siri understands several languages.

Artificial Intelligence (AI) in the area of English language is just growing just like in the other areas. Orai for example, How Orai analyses your speaking is accurate enough. The app presents a range of "challenges",

such as a mission to self-introduction for 60 seconds, or a tongue twister. It records the speaking, when it is done, offers some facts about the speech. It records how many filler words used (along with which ones), how clear the speaking was (enunciation), how fast/slow, and whether or not the speech had sufficient vocal variation. . In addition to these statistics, the app offers a transcript of what said. The user can play returned the recording of the speech, and can press on any phrase of the transcript to jump to that section of the recording. That function alone is very beneficial if the user wants to rapidly find a spot in the speech to play back. While the pace metric looks accurate, the advice the app gives is not always good. The vocal variation metric seemed to work very well. When the user spoke in one tone of voice, it warned the user that he/she has to vary the tone more.

In the area of writing, there are many add-ons facilities function as proof-reader, such as GradeProof, Grammarly, Writing-Reviser and many more. This turns into a competitive industry and a lot more names to be filling up the AI proofreading services niche in the coming years. Big names like of Microsoft, Google and Apple will lead the way with this kind of technology – or simply buy out the systems that do all the difficult work on their behalf. Artificial intelligence will make a good-quality proofreading services device for instructional manuals, recipes and method descriptions. A more dependable breed of spelling and grammar exams will make it simpler to proofread large volumes of textual content and concentrate extra on the message instead than searching for the peculiar misplaced apostrophe. As with most advances in artificial talent right now, AI proofreading tools are helping college students to do their writing more effectively.

There is additionally popular AI for developing a lesson. Make a lesson on www.lessonwriter.com and get a lesson with up to seven exceptional exposures to new vocabulary. The pre-teach vocabulary phase offers instructors a chance to introduce new vocabulary by using way of entire class or small group instruction. Then students come across the vocabulary in the context of the passage and in three separate reinforcement exercise routines (fill-in-the-blank, matching, and write your very own sentences). Teachers can also without difficulty create flash cards and word searches from these vocabulary words. Not only helping developing the lesson but also developing entire lesson plan and answer keys for the exercises.

With the new inventions such as AI, schools and universities around the globe are entering new challenges and opportunities to take students to master the skills required to enter the job markets where AI has taken the routine and manual jobs. A number of professionals consider that adoption of Industry 4.0 will result in accelerated use of robots. Given that these robots will be successful of performing tasks a couple of times with high degrees of accuracy and within shorter time period than humans, robots will act as an environment friendly replacement for labor. Schools and universities have to teach students the skills

that robots cannot perform. These skills is known as fundamental skills, core skills or 21st century skills. These skills are critical thinking and problem solving, communication and collaboration, technology literacy and social skills. A focus on creativity, critical thinking, communication and collaboration is essential to prepare students for the future. Creativity is about thinking through information in new ways, making new connections and coming up with innovative solutions to problems. Critical thinking is about analyzing information and critiquing claims. Communication is understanding things well enough to share them clearly with other people. Collaboration is about teamwork and collective genius with ICT as a tool.

SOME TIPS FOR STUDENTS

As previously discussed, technology, internet and AI have changed industries, schools and university and even our daily life. The business world is accelerating and people who perform at their best are becoming sparser. The following are some tips for students in facing the challenge of digital world.

Don't procrastinate

One common misconception is that students' professional experience starts after college. Start looking for opportunities while studying is a smart move by looking for work related to the major. For example, graphic design students could benefit from working in a print production. This gives an inside look at how the business runs. Accounting students may want to work as a receptionist at the local supermarket.

Expand knowledge

Students learn a couple of abilities in college. Some are related to career; others may also appear much less useful. Open idea to these so-called "useless" skills. They can also come in accessible one day. Expand your skills and knowledge. Companies look for crew individuals with the potential to work in numerous settings. Look for courses that complement the major. Computer programmer majors can take a few enterprise courses to expand their marketability. Architect college students may additionally want to take a few graphic design or artwork lessons to help enhance creativity and their "eye" for art.

Stay up-to-date

While some entry-level careers are more competitive than others, all jobs require work and preparation. Staying modern on technology and industry developments gives an advantage over other applicants. Most college students are more up to date with science than professional professionals, giving them the higher hand. Those same college students however, show a lack of information of enterprise trends. Visit your school library and study professional journals every month. These provide an in-depth look at the altering panorama inside profession and will help better prepare for what's to come. Google provides a news subscription, customizable to any search phrase or phrase. Set up an automatic search and acquire up-to-date news alerts each month.

Upgrade personal to professional

Transforming into a professional, it is important to make a few changes that employer will appreciate:

- **Get a professional email address** - Get a new email address and use your first and last name wherever possible.
- **Clean your online presence** – Employers are using social media to find out the personality of the applicants.
- **Google yourself** – Clean unnecessary photos, postings, Facebook and Twitter status; they are all there for access. Again, just make sure there is nothing out there that could jeopardize the chances before the interview stage.
- **Get a professional online presence by using LinkedIn** – There are lots of articles about how to build profile along with the tips.

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