TECHNOLOGICAL ADVANCEMENTS IN EDUCATION 4.0

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ABSTRACT:
The use of technological advancements in teaching and learning can enhance the teaching and learning process and create the interest of learners to participate in the learning materials. Education 4.0 in a way completes the phenomenon of digital penetration in our everyday lives. In Malaysia, education 4.0 is more highlighted to embrace the fourth industrial revolution as part of the call to revamp the Malaysian higher education system. To realize this, first, the process of using technological advancements in teaching and learning must be changed. In this paper, the technological advancements in IR4.0 consists of the 3D Printing, augmented reality, virtual reality, cloud computing, hologram, biometrics, multi-touch LCD screen, internet of things, artificial intelligence, big data and qr-code for educational purposes. This paper provides a review of using technological advancement in education 4.0.
Keywords: teaching and learning, technological advancements, education 4.0

INTRODUCTION

The first industrial rotation was built on steam king; the second industrial rotation humans harnessed the new energies of petro carbons and electrical energy; the third industrial revolution has seen information technology shrink incredible processing index from mainframe computers to mobile that connect individual across continent instantaneously. Currently, we are entering a fourth industrial years that will be based upon a combination of the existing and the new, and it is a years that will bring more significant changes than everything that had gone before. For instance, traditional equipments will be replaced to the massive environmental equipments (Ali, 2017).

Education 4.0 in a way completes the phenomenon of digital integration in our everyday lives where human beings and machines are aligned to take out solvent, troubleshoot and of course discover new theory of innovation. In education 4.0, information is available ubiquitously and teaching and learning process has become dynamic. In the evolvements of technological advancements, it is not complex to envisage what education 4.0 hold for us. The future of education 4.0 can change economic utilization of information in a remarkable way. To address the needs of industrial revolution 4.0 (IR4.0) in education, higher learning institutions must keep on integrating an innovative method to enhance the teaching and learning process.

THE MOVEMENT OF EDUCATION 4.0 IN MALAYSIAN EDUCATION SYSTEM

The movement of education 4.0 in Malaysian education system started when former Higher Education Minister Datuk Seri Idris Jusoh highlighted the theme of "Higher Education 4.0: Knowledge, Industry and Humanity" in 2018. He believes that the integration of IR4.0 in Malaysian higher education system will help the learning institutions to stay relevant and competitive in the dawning of Industry 4.0. Higher learning institutions are urge to revamp their education system and take initiatives to embrace the teaching and learning 4.0. One of the underpinned in teaching and learning 4.0 is the advances use of technology 4.0 such as 3D Printing, augmented reality, virtual reality, cloud computing, hologram, biometrics, multi-touch LCD screen, internet of things, artificial intelligence, big data and qr-code and so forth. The theme also introduced four components that need to be emphasizing such as first, redesigned the learning spaces with the usage of multi-tiered collaborative tables and smart board. Second, utilize diverse pedagogies such as heutagogy, pedagogy and cybergogy. Third, employ fluid and organic curriculum where higher learning institutions need to adopt the innovations without being tight

by traditional curriculum practices. Fourth, incorporating the usage of technological advancements in teaching and learning process.

Other than these four components, the theme are also focusing on the concept of 'evaluation without examinations' which any assessments are not solely based on examinations. Students also need to be prepare for Industry 4.0 where the TVET 4,0 framework could help to lesser the number of unemployment issues. Another aspect is the collaboration between the industry and university which the industry and academia act as one to fulfil the industry needs. Higher learning institutions could take initiatives to introduce the programs such as 2u2i and CEO@Faculty programs. Finally, the human element needs to go along where the merging of IR4.0 in academia should benefit humanity in the long run. To achieve this, the process of teaching and learning and incorporating latest technology must be transformed (Dzulkifli, 2017).

## THE LATEST TECHNOLOGICALADVANCEMENTS IN EDUCATION 4.0

The usage of technological advancements in education 4.0 is expected to present significant role for higher learning institution (Blaschke, 2012). Incorporating the latest technologies, it can raise the effectiveness of teaching and learning process (Vawn, 2018). With new technologies, students would have more attention towards learning and they would require for more (John & Cedric, 2004). Here are the examples of the latest technologies advancements in education 4.0:

1. 3D Printing
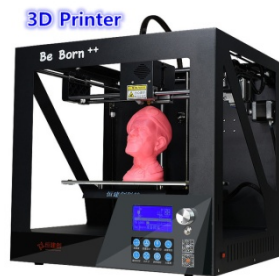
Students view is not only limited to text book pictures, By using this 3D printer, students will have access to 3D models of different elements which 3D view helps them to have a deeper level understanding of their subjects.

2. Augmented Reality
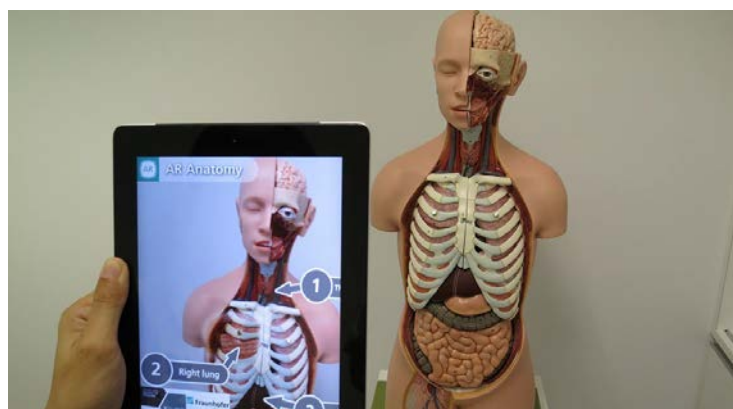
The use of augmented reality helps students to gain their interest in learning because this technology provides an indirect vision of a real-world setting. Students will get an experience of getting physical with better sensory inputs and graphics elements.

3. Virtual Reality (VR)

This technology helps student to gain deeper engagement as compared to a traditional textbook. They will gain visual elements enhances the connections between learning concepts and information effectively.

4. Cloud Computing

This advanced technology help students lesser their burden to carry their home works, heavy text books and assignments. With internet connection, they are able to access their work at home from their class anytime and anywhere.

5. Hologram

This technology helps student to learn in real time which can be integrate into the real environment. This technology also offers a visual and interactive learning experience.

6. Biometrics

The facial recognition, fingerprints and eye tracking are helpful in easing off the class attendance which can saves times in the classroom, for security purposes and create a better understanding of student engagement. In libraries, this technology can be used to identify students who are borrowing books.

7. Paper-thin Smartphone

This technology is not only durable or unbreakable but also offers interactivity in the classroom and paperless. Paper thin smartphone operates like a small sheet of interactive paper. This means when students are reading they do not feel like they are holding a sheet of glass or metal.

### 8. Multi-touch LCD screen

This technology presents the perfect presentation solution than the traditional big board in front of the classroom. Students will sit around the table tablet, swipe on the board to manipulate and drag images around the screen, or type notes with their onscreen keyboards.

9. Internet of Things

The internet of things influences education specifically with the ever-growing popularity of mobile devices. This technology helps to establish a rapid communication and interaction between the students and teachers in and outside the classroom.

10. Artificial Intelligence
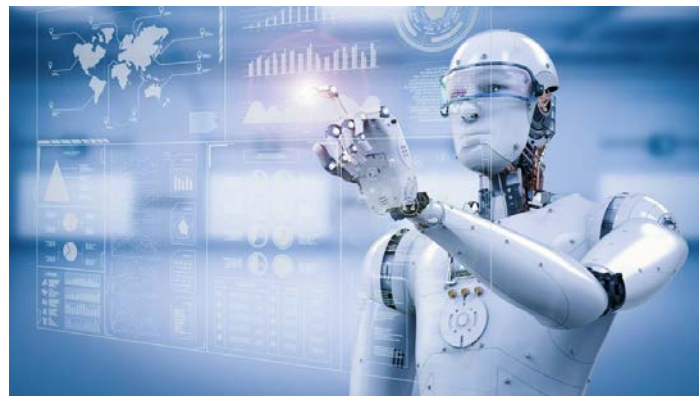
This technology can accelerates the teaching and learning process and also improving the student learning experience. It can reduces the irrelevant work that teachers have to do every now and then, which means they can focus more in meaningful learning experience for the students.

10. Big Data

This technology help the institution to manage data which it is possible to find evidenceand can facilitate interchange of data among institutions and students. For instance, the institutions able to identify of how well students are learning, students' drop out pattern, students' academic performance or predict any information related to attendance patterns.

11. QR-code
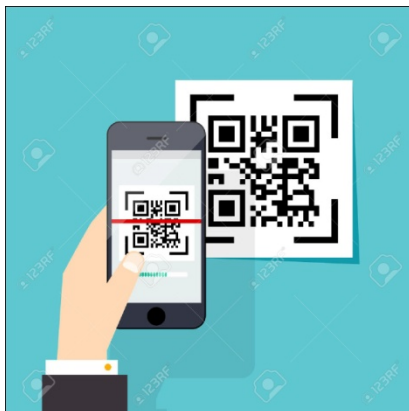
A Quick Response (QR) code is a digital image available from free QR scanner apps that can be scanned using any devices such as mobile, ipad, laptop and so forth. When the students scan the code, it will be taken directly to a website. This technology use in the classroom can reduce the frustration of long web addresses, user friendly and save time which they can quickly scan the QR code easily to the website.

CONCLUSION

One of the ways to boost our education system is by using advance technology in teaching and learning process. This is to help student understand the learning contents effectively than using those traditional approach, In line with industry revolution 4.0, Malaysia needs to improve the education system so that Malaysia can be one of the competitive countries in the world. Since students are more favour towards using technology, educators need to move a step forward. Malaysian Ministry of Education also need to provide adequate facilities to learning institutions in order for them to utilize the technology 4.0 effectively.

Previous studies have shown that the usage of technology has helped students to improve their learning (Halili, Nurul & Rafiza, 2018; Halili & Suguneswary, 2016; Halili & Hamidah, 2016; Maryam & Halili, 2015). In the era of education 4.0, students are able to search millions of information in the internet, interact and collaborate with each other and so forth. Thus, policymaker need to play their role by making the use of latest technology 4.0 in teaching and learning process by educators is compulsory. Educators need to attend a training of how to expert in using this advance technology in order to develop their skills and competency. This is one of the ways to assist educators to understand and explore in using these technologies 4.0 in classroom.

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