

Teacher's ICT Skills and Readiness of Integrating Augmented Reality in Education

Azrie Salleh
Faculty of Computing, College of
Computing and Applied Sciences,
Universiti Malaysia Pahang, 26600
Pekan, Malaysia
azrie6959.salleh@gmail.com

Danakorn Nincarean Eh Phon
Faculty of Computing, College of
Computing and Applied Sciences,
Universiti Malaysia Pahang, 26600
Pekan, Malaysia
danakorn@ump.edu.my

Ferda Ernawan
Faculty of Computing, College of
Computing and Applied Sciences,
Universiti Malaysia Pahang, 26600
Pekan, Malaysia
ferda@ump.edu.my

Ahmad Yusuf Ismail
Faculty of Engineering
Kunsan National University
Gunsan, South Korea, 54150
yusuf85@kunsan.ac.kr

Prajanto Wahyu Adi
Department of Informatics,
Diponegoro University
Semarang, Indonesia
prajanto@lecturer.undip.ac.id

Abstract— In recent years, the ministry of education has adopted policies aimed at enhancing the consistency and efficacy of the teaching and learning process. In the midst of the Covid-19 pandemic, the implementation of different alternatives to the current teaching and learning mechanism is extremely crucial. With the migration of the current education online, AR is viewed to be a suitable and relevant alternative to be implemented. However, study on teacher readiness to adopt AR in education is still absent. Therefore, there is a need to investigate teacher's ICT skills and their readiness in deploying AR in teaching and learning. This research uses quantitative study and survey as the research methodology with 96 teachers involved as a participant. The data analysis is performed using descriptive analysis with the help of SPSS software. The findings showed that teachers in this research show a minimum to moderate level of expertise skilled in handling different ICT aspects. In addition, the research has also shown that teachers in this study show less familiarity with AR technology. The significance of this study is able to provide a set of empirical results that is beneficial for further education planning by the government.

Keywords—augmented reality, teachers, readiness, ICT skill, AR technology

I. INTRODUCTION

In general, the current teaching and learning are still being conducted in traditional methods. Heading towards the Industrial Revolution 4.0 (IR4.0) in parallel with the current rise of technology, the government is proactively introducing the 21st Century Education as an initiative to benefit the usage of technology in education to generate a generation that is both smart and IT intellect. The combination of different methods, approaches, strategies and effective teaching in education will produce excellent students in a number of fields. At a time when the world is facing the Covid-19 pandemic, teachers need to find suitable methods to attract students to continue learning. Many literature have highlighted the potential of Augmented Reality (AR) for teachers to use in class to engage students or children in learning [1][2].

The emergence of technology such as Augmented Reality (AR) has been described as a possible advantage for the field of education. Especially as the world is dealing Covid-19 pandemic, the world of education is also being impacted by the modern expectations of teaching and learning systems that teachers need to find the right media to encourage students to learn. AR is a 3D platform that merges the physical and digital world with three main pillars in real time: tools to monitor knowledge about real world objects of interest; hardware, and software for information processing [3]. AR is a technology that incorporates virtual objects into reality and enables users to communicate with virtual objects.

AR applications have great potential because they are able to represent phenomena visually in three dimensions. However, this AR technology has not yet been widely applied [4][5]. Integrating AR into teaching and learning is a complex process which requires readiness and may encounter a number of difficulties. Teacher's readiness is one of the main considerations in the adoption of AR. As an instructor serves as a full mediator in the classroom, teacher preparation and acceptance are key in incorporating emerging technologies in teaching and learning [6][7]. There are a few aspects that need to be taken into account in evaluating a teacher's readiness. For example, teaching ICT skills. If the teacher has inadequate training in handling and operating ICT equipment, it will surely affect the perception of a teacher in implementing a new teaching medium with a new technology. This will in fact influence the readiness level of the teacher. Other elements include current knowledge about IT technology, and the teacher's attitude toward the new technology and future change. Due to this problem and gaps, therefore, there is a need to investigate teacher's ICT skills and their readiness in deploying AR in teaching and learning.

II. RELATED WORKS

Teaching and learning are active processes occurring simultaneously on a continuous basis. Teaching is a mean of facilitating and supporting learning and involves contingent functions. Most of the teaching and learning process are still