FACULTY OF ARCHITECTURE PLANNING AND SURVEYING

UNIVERSITI TEKNOLOGI MARA

CAWANGAN SARAWAK

CONSTRUCTION STAKEHOLDERS' AWARENESS TOWARDS THE APPLICATION OF VIRTUAL REALITY FOR SAFETY TRAINING

Dissertation submitted in partial fulfillment of the requirement for the award of Bachelor of Quantity Surveying (Honours)

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SEMESTER: FEBRUARY 2021-JULY 2021

ABSTRACT

The construction industry is known for its dangerous works and high risks, especially on-site. There are lots of fatal injuries in the construction industry all over the world. Malaysia is no exception from it, and lots of evidence can be seen throughout the news and articles regarding this issue. The problems that being outlined in this research are the lack of awareness regarding virtual reality's technology existence, perceptions towards virtual reality technology and cost to implement virtual reality. This research aims to know the level of awareness in applying virtual reality to train labours.

There are three objectives in this study. Firstly, to determine the importance of safety in construction sites. Secondly, to identify the barriers of implementing virtual reality technology to train labours in the construction industry. Thirdly, to investigate the level of awareness in applying virtual reality for safety training. Questionnaire survey method is used for this study and the data collected is analysed using SPSS software.

Research is done in Sarawak because it is easier and faster to reach the respondents as well as to improve and solve this safety issue in Sarawak. The respondents of this research are construction stakeholders such as contractors, consultants and developers.

ACKNOWLEDGEMENT

First and first, I would want to express my thanks to Allah, the Almighty God, for providing the chance to complete my dissertation and fulfil its objective. I would want to express my heartfelt gratitude to my dissertation supervisor, Sr. Dr. Hjh. Noraziah Binti Wahi, for her continual advice, monitoring, and morale inspiration during the dissertation-writing process, especially during this worldwide pandemic of COVID-19.

Besides that, I would also like to thank my family and friends for helping me whenever I need them, especially in terms of moral motivation. I would not have gone as far with this study if it had not been for their assistance.

Lastly, I would like to thank my classmates of Bachelor of Quantity Surveying for helping me by sharing information that they have, especially during these difficult times of online classes, where we are far from each other, and communication is very important. Finally, a special thanks to all of the participants in this study who took the time to complete the questionnaire and contribute valuable data to this research.

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CHAPTER 1

INTRODUCTION

1.0 INTRODUCTION

Construction is a dangerous work where labours are often at risk of fatal accidents. It is difficult to fully recognize unsafe situations that appear and disappear in construction sites due to different situations, locations, and weather. Many new and advanced technologies have been established in the AEC industry including Building Information Modelling (BIM), 3D printers, Drones/Unmanned Aerial Vehicles (UAV), 'Cloud' platforms, Augmented Reality (AR) and Virtual Reality (VR) (Piroozfar, Essa & Eric, 2017). One of the technological tools employed by the construction industry is called Virtual Reality, in which a three-dimensional, computer-generated environment can be explored and interacted by a person (Behzadi 2016).

A representative taxonomy of the visualization system for positioning VR was originally made by Milgram and Colquhoum, and describes how "virtual" and "real" are merged in different proportions for creating a visualization environment (Pang, Peng, Jun, Hung-lin & Xiangyu, 2018). From fun cartoons to 3D awareness-raising videos and e-learning modules, the sector has set itself the goal of massively reducing construction site accidents, which are primarily due to preventable flaws (Hafsia, Monacelli, and Martin 2018). In terms of training, VR offers the possibility of effective training while significantly reducing cost and safety risks related to mock-ups (Barkokebas, Ritter, Sirbu, Li & Al-Hussein, 2019).

Recent studies indicate the benefits of AR/VR in the AEC industry by demonstrating potential applications, such as safety training, visualization, communication and energy management (Noghabaei et al. 2019). Along with other researchers and experts, it is argued in this paper that novel technology can enhance trainee experience, improve training standards, eliminate or reduce health and safety