**SUPERVISOR APPROVAL**

I / We hereby declare that have read this work in my / our this works entitled:
The acceptance of Malaysian students on virtual reality medium of teaching and learning in classroom

By

Pat Kar Weng

I hereby acknowledge that the scope and quality of the submission has been accepted for
Bachelor of Technopreneurship with (Honours)

Signature : ……

Name of Main Supervisor : …….

Date : ……

Signature : …….

Name of Panel Supervisor : …….

Date : …….

# THE ACCEPTANCE OF MALAYSIAN STUDENTS ON VIRTUAL REALITY MEDIUM OF TEACHING AND LEARNING IN CLASSROOM

PAT KAR WENG

UNIVERSITI TEKNIKAL MALAYSIA MELAKA

# THE ACCEPTANCE OF MALAYSIAN STUDENTS ON VIRTUAL REALITY MEDIUM OF TEACHING AND LEARNING IN CLASSROOM

PAT KAR WENG

The report submitted in partial fulfillment of the requirements for the Bachelor of Technopreneurship with (Honours)

Faculty of Technology Management and Technopreneurship
Universiti Teknikal Malaysia Melaka

JUNE 2018

# DECLARATION

I declare that this project is the result of my own research except as cited in the references. The research project has not been for any degree and is not concurrently submitted in candidature of any other degree.

Signature : …….

Name : ……

Date : ……

# DEDICATION

This research paper managed to complete successfully due to the fully support from my respective family. They have provided me lots of inspiration and the drive to complete tasks with more tolerant. Without their support, the research impossible to complete so well. And not to forget, my supervisor Dr. Murzidah binti Ahmad Murad and my panel Ir Burdiono Hardjono have provided me guidance in this project.

# ACKNOWLEDGEMENT

I would like to say my deepest gratefulness to my supervisor, Dr. Murzidah binti Ahmad Murad for her guidance, teaching and supervision to me throughout the completion of my final year project.

Besides, I would also like to express my thankfulness to all my lecturers and faculty staffs that had been assisting and teaching me in this four-year university life. Their supervision, comments and knowledge had significantly directly or indirectly contributed to my final year project.

Meanwhile, I have to say thank you to my fellow course mates, which also provide useful suggestions and information to my project. Also, I would like to thank my family member as they always physically and mentally support me during the project period.

A lot of thanks would like to deliver to all of you throughout this journey of my life and because of the contribution and the guideline has made a success of my project.

Once again I would to say thank you to all of the parties involved from family, friends, lecturers and my supervisor which made success of my project.

Thank you very much.

# ABSTRACT

This study aims to discover the acceptance level of Malaysian students in using Virtual Reality learning tools in education. Virtual reality (VR) is a computer technology that create virtual environment with the involvement of user's physical presence along with realistic images, sounds and other sensations. The involvement can be made by using virtual reality headsets or devices. Malaysia is now moving towards a high-income nation therefore education system must improve time to time. Students' awareness is important in order to implement virtual reality learning tools in higher education institutions (HEIs). In this study, researcher will identify and discuss the most variable/s that contribute to the factors on virtual reality and also the level of intention of people to use this virtual reality. Literature Review indicates that factors such as perceived usefulness, perceived ease of use, perceived enjoyment and perceived system quality on acceptance level of Malaysian students towards virtual reality learning tools in education. A set of questionnaire was developed and distributed to 500 respondents according to the population size and sample size has been carried out with Krejcie and Morgan table. The correlation analysis will test whether the relationship is positive or negative. Whereas, multiple linear regression examine that how the multiple independent variables are related to the dependent variable. The demographic analysis will test on the preferable of Malaysian students to use the virtual reality learning tools. The Pearson's correlation coefficient will test the hypothesis.

**Keywords –** Virtual Reality (VR), higher education institutions (HEIs), perceived usefulness, perceived ease of use, perceived enjoyment and perceived system quality.

# ABSTRAK

Tujuan kajian ini adalah untuk mendapatkan tahap penerimaan pelajar Malaysia menggunakan alat pembelajaran Reality Maya dalam pendidikan. Reality Maya atau Virtual Reality (VR) adalah teknologi komputer yang mewujudkan persekitaran maya dengan penglibatan kehadiran fizikal pengguna bersama dengan imej, suara dan sensasi yang realistik. Penglibatan boleh dilakukan dengan menggunakan alat dengar maya atau peranti realiti maya. Malaysia kini bergerak ke arah negara berpendapatan tinggi. Oleh itu, sistem pendidikan mesti diperbaiki dari semasa ke semasa. Kesedaran pelajar adalah penting untuk melaksanakan alat pembelajaran realiti maya di institusi pengajian tinggi (IPT). Dalam kajian ini, penyelidik akan mengenal pasti dan membincangkan pembolehubah yang paling menyumbang kepada faktor-faktor dalam realiti maya dan juga tahap niat orang menggunakan realiti maya ini. Kajian literatur menunjukkan bahawa faktor-faktor seperti kegunaan, kemudahan penggunaan, keseronokan dan kualiti sistem di tahap penerimaan pelajar Malaysia ke arah alat pembelajaran realiti maya dalam pendidikan. Satu set soal selidik telah dibangunkan dan diedarkan kepada 500 responden mengikut saiz populasi dan saiz sampel telah dijalankan dengan jadual Krejcie dan Morgan. Analisis korelasi akan menguji sama ada hubungan itu positif atau negatif. Sedangkan, regresi linier berganda meneliti bagaimana pemboleh ubah bebas berganda berkaitan dengan pemboleh ubah bergantung. Analisis demografi akan menguji ke atas pelajar Malaysia yang memilih untuk menggunakan alat pembelajaran realiti maya. Koefisien korelasi Pearson akan menguji hipotesis.

Kata Kunci - Realiti maya (VR), institusi pengajian tinggi (IPT), kegunaan yang dirasa, dirasakan kemudahan penggunaan, keseronokan dan kualiti sistem yang dirasakan.

# TABLE OF CONTENT

# LIST OF TABLES

# LIST OF FIGURES

# LIST OF APPENDIX

# CHAPTER 1

# INTRODUCTION

## 1.0.1 Overview of Virtual Reality (VR) and Education

Virtual Reality (VR) is a computer technology that simulates a user's physical presence in a virtual or imaginary environment which allows the users interact with the world. A person can go into the artificial world and move around in it and interact with virtual features or items by using Head Mounted Displays (HMDs) which is the devices that provide full 360-degree environment vision ability. Through head-mounted virtual reality (VR) devices such as Oculus Rift, HTC Vive, PlayStation VR or Samsung Gear VR, this new advanced technology help combine the user with the immersive and interactive virtual world for them to explore it.

Eyes are not the only sensory organ but whole body movement involved in the VR experience which called virtual environment. Virtual environment that detects body's sensory organs which allows interaction with virtual items.

The users can get the sound from VR scene by using VR speakers or headphones for clear audio. Moreover, the users can touch items appeared in the virtual world (Curcio, 2016). The virtual world is having the immersive environment which are similar with the real world. Augmented reality (AR) systems may also be considered a form of VR that layers virtual information over a live camera feed into a headset, or through a smartphone or tablet device.

Virtual reality will be the approaching technology that can be used in various industry such as education, training, medical, healthcare, military, entertainment and

even tourism (Minocha, 2015). In Multimedia University (MMU), they are working in a heritage preservation project called ‘e-Warisan Senibina’ that rebuild cultural and historical buildings in the virtual world. Some of the buildings in virtual environment might no longer exists in the real world which remind the public about their history and stories. With the use of VR in tourism sector of Melaka, tourists and local people can now understand and interact with traditional buildings by a touch with finger on smart devices. The apps will be known as iMelaka 360 AR app that have a fresh look of historical places such as Stadhuys. (Mawarni, 2017).

Virtual reality (VR) is a latest technology and Sony, Oculus which owned by Facebook is leading in these technology development. VR is a trending thing in the near future therefore Facebook spent $2bn to acquire Oculus which implement the uses of VR in social media for posts, status and new stories (Oyelude, 2017).

VR will be potential technology that can revolutionize education industry as students immersed in interactive learning medium. VR content must be meaningful, engaging, and navigable so that the learning sticks. For the current stage, schools still depends heavily on whiteboards, projectors, computers to deliver lectures or class to students.

In the survey of United States high school settings, 97% of the students would like to use VR for their lectures and courses. 69% of the teachers would like to encourage students to use VR to visit distant location. The VR in education will become a $200 million industry by 2020 and $700 million by 2025. In the new era of 21$^{st}$ century, education is no more fixed in block and mortar mode but can be done in informal way such as lectures out of classroom, or use internet as teaching medium. With the aggressive support and initiatives from government agency, the advanced technology can enter into education industry drastically (Psotka, 2013).

VR based lectures allow particular user such as students gain knowledge which give interesting experience to them since they able interact with the virtual world (Sathia, 2017). Augmented reality (AR) and virtual reality (VR) have been long time involving in entertainment industry and continue to grow further. Meanwhile, in education industry, VR lectures started to replace conventional PowerPoint and video lectures which provides new learning medium to students (Sathia, 2017). High schools and universities are decided to pour in more efforts to fund the VR learning environment see whether good for students (Merchant, 2014). Since the benefits

towards education purpose still not clarified yet, the technology do improve teaching methods such as e-learning and face-to-face which can guide students in the real situation (Fernandez, 2017). The use of VR technology in education settings can allow students to experience in real situation which hardly to be found in classrooms. The involvement of virtual technologies in education possible to redefine the education model in Malaysia.

In view of the above, this paper intends to gauge the students' VR education acceptance and the factor that hinder students to choose VR as learning tools.

### 1.0.2 Education system of Malaysia

The first VR education provider in Malaysia, Giochitech has introduced courses such as Diploma in 3D Multimedia Game Art and Animation and Diploma in 3D Multimedia Interior Design which both with VR interaction subject. Students can become knowledgeable enough is successful search for information which obtained from VR and AR medium. They can also using any of the features of VR devices to complete their tasks and assignments (Massis, 2015). Meanwhile, Multimedia University (MMU) offerings courses that use VR as learning tools as well. The purpose of developing this paper is to determine acceptance of Malaysian students on using VR as learning tools during lectures.

Further research is necessary to evaluate the acceptance level of Malaysian students within universities towards virtual reality medium of teaching and learning in classroom, and so ascertain whether perceived impact of virtual reality medium of teaching and learning in classroom on Malaysian student exist.

### 1.0.3 Malaysia Online Education (e-education)

Malaysian education become more concerns in its standard and quality of education output, therefore more focus will be in new core of learning such as science and mathematics. Higher education such as university play important role in redefine their

campus parameters and produce more students with critical and creative thinking without look deeper in their family background. Engagement with industry is needed so private sector can cooperate with government to provide well-equipped facilities to students. Formalized education with a rigid curriculum will be done in traditional physical classroom, but in order to fulfill the needs of industry university need to transform itself. There is a few external determinants of quality of a university such as ranking, citation and population of foreign students. Other than that, new education technology has to be updated to allow students stay competitive in global stage.

Moreover, there is a reduction in number of 6,000 lecturers due to the downside of Malaysian economics which lead to cut in government funding for local universities. The reduction also causes lack of lecturers to teach in campus and technology as alternative help to teach the students. In the near future, campus not only as a physical learning center but also through online, using virtual reality (VR) and lifelike simulations. Physical interaction will no longer existing and students are flexible to plan their learning schedule.

In this new situation, lecturers need to source funds for university instead just focus on teaching and research alone. They have to change their mindset, perception and modus operandi by welcoming new technology and teaching methods. Adapting the new concept of borderless learning and teaching 'university of the future' by lecturers which they are required to attend courses to learn how to use the digital technology and grapple with destructive technology. For certain disciplines such as surgery, visual arts, these still required physical guidance and engagement.

Future employment in various industry will focus less on paper qualifications but skill, experience and creativity. Therefore, university education of future have to focus in producing critical thinking individuals whom can apply knowledges learned into real life.

## 1.1 Problem Statement

There is a great rising of interests by using the virtual reality(VR) technology in education and training industry instead of entertainment industry alone (Merchant,2014).

However, there are reports mentioned many issues and restrictions occur which virtual reality technology difficult to use widely in higher education industry (Merchant, 2014). Learning can be done in more interactive way by using augmented reality and virtual reality lectures which students can understand better than conventional PowerPoint lectures. Facebook has started using VR technology in entertainment division, education should able to do so (Sathia, 2017). The use of VR for education in Malaysia is relatively small as the learning benefits have yet to be finalized. Moreover, the interaction effects between students and virtual world are hardly be defined as lack of information (Merchant, 2014). There is another obstacle for VR education which is small quantities of AR, VR technologies used and availability of professional to handle the useful educational contexts (Fernandez, 2017).

Nowadays teachers, they are having duties to create more suitable conditions for delivery of knowledges to student-centered learning. Students are the most important person in learning stages, therefore teachers have to use balanced methods to suit the current badge of 'digital natives' (Nanu et al., 2013).

According the report (Saidin, 2015), respondents unhappy with listen the lectures just inside the classroom. They think the using of latest digital technologies would speed up their learning process. To encounter the suggestion, teachers ensure students learn actively and knowledges especially in Science subjects by dig into potential technologies.

Virtual Reality (VR) which provides interaction environment to improve students' learning capabilities. Readiness includes lends VR technology access to the students to develop their interests in learn and play.

According to the S.W.O.T analysis (Minocha, 2015), the public awareness in VR technology still limited which discourage students from using it. The VR devices

that sold in the market still costly to applied massively in educational institutes. Apart from that, students might get attracted with entertainment gadgets instead of educational experience (Minocha, 2015).

Recently, governments have launched few series of initiatives to boost the learning process output and one of it called 'Falsafah Pendidikan Kebangsaan'. To engage students and improve their learning outcomes, initiatives have to be done to modify the traditional classroom teaching method. On top of that, Malaysia required a community with knowledgeable, innovative in science and technology to move forwards as a developed country (Saidin, 2015).

In order to provide answers for the issue above, a study was carried out in Melaka universities with purpose a) to evaluate the acceptance level of Malaysian students towards virtual reality medium of teaching and learning in classroom b) to examine the factors that influencing and hindering intention of use of VR and c) to examine the most significant factor towards Malaysian students.

## 1.2 Significance of Study for Academics

This study can help in identifying whether VR technology is truly acceptable in higher education settings and benefits the students. Although the effectiveness of implementation of VR technology in education has yet to be identified, but this is the new trend of developing new technology in some industries such as healthcare, military &training, and entertainment.

Since the effectiveness of using VR technology have not be clarified, therefore through this research the readiness level towards VR as learning medium in education within Malaysian students can be find out. The researchers can help in identifying the effectiveness of VR education. The target group of Malaysian students can increase their awareness towards the availability of VR as teaching tools.

There is a possibility of next action such as implementation of VR education in mass if Malaysian students and other parties agreed that the VR technology can motivates their learning and improve the learning results. This research would impart

a great deal of knowledge as to what is the factor that prevent implementation of VR education and main benefits that can be obtained from the new learning medium.

This research would also benefit Malaysian students and educational institutions in learning the relationship between the readiness and the VR learning medium and tools and how effective it is.

## 1.3 Limitations

The research's limitation is the research conduct in quantitative method which the information about virtual reality in education Malaysia is insufficient due to the focus in Microsoft PowerPoint lecture class. Therefore, the result obtained would only focus in the awareness and intention to use VR as learning tools among Malaysian students.

## 1.4 Research Objectives

1) To analyze the acceptance level of Malaysian students on virtual reality medium of teaching and learning in classroom.

2) To explore the factor that influence and hinder Malaysian students on virtual reality medium of teaching and learning in classroom.

3) To identify the most significant factor that influence and hinder Malaysian students on virtual reality medium of teaching and learning in classroom.

## 1.5 Research Questions

1) What is the acceptance level of Malaysian students on virtual reality medium of teaching and learning in classroom?

2) What is the factor that influence and hinder Malaysian students on virtual reality medium of teaching and learning in classroom?

3) What is the most significant factor that influence and hinder Malaysian students on virtual reality medium of teaching and learning in classroom on Malaysian students?

## 1.6 Summary

Chapter 1 focus on status and background of current virtual reality technology in all around the world and described the education system in Malaysia. However, there will have problems statements that occurred among people as this virtual reality still new to the public. Hence, there is a need to carry out the research and define the factors will be considered for Malaysians. Thus come out the research questions and research objectives for this study.

# CHAPTER 2

# LITERATURE REVIEW

Acceptance level is the willingness and ability to adapt and do something; it also refers to individual or institution that already using or will use something for their current tasks.

In general, virtual reality acceptance is defined as an institution's acceptance in adapting virtual reality in classroom which means institutions mentally and physically ready to improve virtual reality learning medium and expand its coverage. Based on previous studies, the measurement of virtual reality acceptance factors commonly used is the individual's attitude itself.

Many theories have been submitted to discuss factor that influence and hinder the implementation of Virtual reality (VR) technology in education industry. Although the literature covers a wide variety of such theories, this review made to zoom in on four major themes that prominent repeatedly throughout the literature reviewed. The themes mentioned are such as challenges of virtual reality in education, current technology landscape, perceived impact of virtual reality medium of teaching, and the technology application in education.

Moreover the literature presents these themes in a variety of contexts, this paper will primarily focus on their application in higher education settings.