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**GENERATION-Y (GEN-Y) INTENTION TO USE OF AUGMENTED REALITY  
(AR) TECHNOLOGY IN HIGHER EDUCATION.**

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This thesis is submitted in partial fulfilment of the requirements for  
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## DECLARATION

I hereby declared that this thesis entitled  
**“GENERATION-Y (GEN-Y) INTENTION TO USE OF AUGMENTED  
REALITY (AR) TECHNOLOGY IN HIGHER EDUCATION”**  
is the result of my own research except as cited in the references. The thesis has not  
been accepted for any degree and is not concurrently submitted in the candidature of any  
other degree.

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## ABSTRACT

In today world, technical element has been part of the world leading trend as it has become needs nowadays to measure level of technology in any institutional and even now in high education institution, dependence toward technology need to be continuously evaluate as to keep up with level of thinking and perceived toward intention to use of technology. Augmented reality nowadays shows a rapid increase usage in many areas such as transportation, health, gaming, tourism, commercialization and many more. A new era in educational has been opened with the augmented reality technology practices developed for every level of learning. It is possible to use augmented reality application for almost every subject such as engineering, medical, architecture, astronomy and many more. The group of respondent is from University Technical Malaysia Malacca, Multimedia University and Universiti Teknologi Mara and they will to answer the question about the augmented reality technology. This study will evaluate the intention to use of Generation-Y (Gen-Y) using the Augmented Reality technology for education purpose. In this way, it is possible to disseminate education services to Gen-Y and to ensure easy and permanent learning that is independent of time and place, to deliver updated information to people timely and to enable participatory education.

**Keyword** – *Augmented reality, AR, education, generation-Y, Gen Y, Technology Acceptance Model*

## ABSTRAK

Di dunia hari ini, elemen teknikal telah menjadi sebahagian daripada trend utama dunia kerana ia menjadi keperluan pada saat ini untuk mengukur tahap teknologi di mana-mana institusi dan bahkan sekarang di institusi pendidikan tinggi, kebergantungan terhadap teknologi perlu sentiasa menilai untuk bersaing dengan tahap daya berfikir dan melihat terhadap niat untuk menggunakan teknologi. Realiti terimbuh diperkaya pada masa kini menunjukkan penggunaan pesat dalam banyak bidang seperti pengangkutan, kesihatan, permainan, pelancongan, pengkomersialan dan banyak lagi. Era baru dalam pendidikan telah dibuka dengan amalan teknologi realiti terimbuh yang diperkembangkan untuk setiap peringkat pembelajaran. Ia boleh menggunakan aplikasi realiti terimbuh tambahan untuk hampir setiap subjek seperti kejuruteraan, perubatan, seni bina, astronomi dan banyak lagi. Kumpulan responden terdiri daripada pelajar Universiti Teknikal Malaysia Melaka, Universiti Multimedia dan Universiti Teknologi Mara dan mereka akan menjawab soalan mengenai teknologi realiti terimbuh. Kajian ini akan menilai niat untuk menggunakan Generasi-Y (Gen-Y) menggunakan teknologi Realiti terimbuh untuk tujuan pendidikan. Dengan cara ini, adalah mungkin untuk menyebarkan perkhidmatan pendidikan kepada Gen-Y dan untuk memastikan pembelajaran mudah dan kekal yang bebas daripada tempat dan masa, untuk menyampaikan maklumat terkini kepada orang-orang pada masa yang tepat dan untuk membolehkan penyertaan secara pendidikan.

**Keyword** – *Augmented reality, AR, pendidikan, generasi-Y, Gen Y, Technology Acceptance Model*

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## **Chapter 1**

### **Introduction**

#### **1.0 Introduction**

This chapter had been discussed towards the overview of the research. It will consist of introduction, background of the study, problem statement, research question and research objective.

#### **1.1 Background of the Study**

Education is important because it is the one of the regions that the social orders put resources into. The most critical highlights of the social orders put resources into education which are otherwise called information social orders is they can effectively join preparing with new techniques, technologies and methodologies (Nilgul Tosun, 2017). In education they would possible be able to communicate education administration to an

extensive variety of individuals and to ensure it can be simple and changeless discovering that is free of time and place. It likewise to convey refreshed information to individuals and to empower individuals to take part of education. (Nilgul Tosun, 2017)

Nowadays, augmented reality is also implemented in the education field (Nor Farhah, P. S. Medicherla, S. C. Yuen, 2015, 2010, 2011). Steve Chi-Yin (2011) says that augmented reality (AR) is a rising type of involvement in which the real world (RW) is upgraded by computer-produce content which is attached to particular areas as well as exercises. AR was first utilized as a part of the 1990s, when applications were identified with the preparation of pilots (T. P. Caudell, 1992). In basic terms, AR enables advanced substance to be consistently overlaid and blended into our impression of the real world. Notwithstanding the 2D and 3D objects which numerous may expect, advanced resources, for example, sound and video files, literary information, and even material information can be joined into users' perception of the real world. These increases can serve to help and improve users' information, knowledge and comprehension of what is happening around them. As opposed to appearing to be strange, the computerized markups intrinsic in AR gives users a chance to see the real world, alongside 'added' data, as a solitary, seamless environment (Steve Chi-Yin Yuen, 2011).

There are many researchers have recognized Augmented Reality as having the capacity to upgrade learning and educating (Billingham & Duenser, 2012). Augmented Reality can be applied for learning, diversion, or edutainment by upgrading a client's impression of and association with the real world. Users can move around the three-dimensional virtual image and view it from any vantage point, much the same as a real object. The information conveyed on by the virtual objects enables clients to perform real world tasks. Substantial Interface Metaphor is one of the imperative approaches to enhance learning. This property empowers control of three-dimensional virtual objects essentially by moving real world without mouse or console (Mehmet Kesim, Yasin Ozarslan, 2015).

In today's technology, augmented reality application is important and it will become new learning model for 21<sup>st</sup> century student or generation-Y. The use of new technologies and techniques such as multimedia and virtual reality in education has been increased enormously and became more common in the new century (Ng G.W., 2016). More recently in Malaysia, Tomi and Rambli (2013) found that the AR supported books could enhance students reading and learning experience.

This study seeks to investigate that the intention to use of generation – Y (gen-Y) using the Augmented reality technology for education.

## **1.2 Problem statement**

We are on the verge of ubiquitously intention to use of Augmented Reality (AR) technologies to enhance the perception and help the generation - Y to see, hear, and feel the environments in new and enriched ways. AR will support in fields in education for many subjects such as engineering, medical, architecture and many more (Wu et al. 2013). Students in AR environments might be intellectually over-burden by the huge measure of information they experience, the numerous technological device gadgets they are required to utilize, and the intricate errands they need to finish (Wu et al. 2013). Assimilator have noticed that formal taking in ought to be built up from the understudies' epitomized encounters of the world (Niebert, Marsch, & Treagust, 2012), in this way it important to put the students in an arranged domain in view of the plan standards of exemplified insight and learning (Wilson, 2002). For example, the universities have directed exemplified learning by furnishing with a tangible user interface (TUI), and found that the members would be wise to learning execution in comparability with those utilizing a mouse (Skulmowski, Pradel, Kühnert, Brunnett, & Rey, 2016). The students with a worldwide learning style disliked to confine their learning ventures as was required in the errand based AR in educational (Tortorella &Graf, 2015).

Although this technology can enhance the educational system, there are many problem to use this technology because we are lacking of knowledge on AR existence in Malaysia. The lacking of the expertise of augmented reality technology can block the education style in Malaysia. This technology can apply to both teacher and the students. This is because there are two-way communication when they use this technology and they can learn or improve if use the Augmented Reality technology in education. The student in generation Y is most important in this role and to know that they are ready or not to use the Augmented Reality in education system. In this research, the researcher will carry out the factors that influence generation-y are ready or not to use the augmented reality for education.

### **1.3 Research Question**

Following are the research question proposed:

RQ1: What are the factors that intention to use of gen-y to use AR implementation in higher education?

RQ2: What is the level of intention to use of Gen-Y of Augmented Reality implementation in higher education?

RQ3: What is the perceive benefits of AR implementation in higher education by Gen-Y?



## 1.4 Research Objective

According to the stated research question, the objective of this study is:

RO1: To determine the factors that intention to use of gen-y to use AR implementation in higher education.

RO2: To investigate the level of intention to use of Gen-Y of Augmented Reality implementation in higher education.

RO3: To identify the perceive benefits of AR implementation in higher education by Gen-Y.

## 1.5 Significant of the study

This purpose of this study is to investigate the intention of use of generation Y of using augmented reality technology system for education purpose in learning at higher education Malaysian universities. This is an ongoing long-term study which the goal is to raise a user's perception and understanding about the complex process and the phenomenon of the subjects. The different between augmented reality (AR) and virtual reality (VR) systems is it aims to replace the perception of the world with an artificial one. The augmented reality systems provides better means to make students learn in an interactive learning environment and get the involvement and metacognitive skills for better "transfer" of learning. The "transfer" can be increased by helping the students become active and aware of their performance in understanding what they learn.

Augmented Reality interface can allows the students to promote reflection of the metacognitive process which is the students could see the real world as well as the virtual imagery, augmenting the real world with additional information. Although arranged

learning furnishes students with a virtual environment which copies the real world, when utilizing Augmented Reality (AR) in reality could all the more solidly bolster understudies in accomplishing the learning goals. Besides, the way of the understudy collaboration with learning knowledge is changing, for example, they don't just utilize the content box or console and mice to interface with on-screen content however now the understudy can utilize their entire body to connect with educational substance that seems to exit in the physical world.

## **1.6 Scope and limitation of the study**

This research provides the evidence of an effect between AR technology implement in education style and to know the perception of the generation-y intention to using the technology. This can approach to discover the effects of human-interface relationship and how they determine the education style. The target group of this research are people belonging to Generation-Y and the researcher not able to generalize findings on any other demographic groups. The other limitation that the researcher face is the time and money to finish this thesis.

To finish this thesis need several time to get the data collection and respondent. Although the respondent is generation-y, some of they will not give the cooperation to answer the questionnaire. This is because the students' overloaded work and the need to some extent. This might be affect the result of the respondent answers. The money also can be the barrier to finish the thesis because some of the previous research need to buy to get the information of this research. Finally, the slow network might discourage the participant interest and motivation in joining peer feedback activities.

## **1.7 Summary**

Chapter 1 summaries the outline of the research study. The background to the study focused on the education system and a simple review of augmented reality, then this study followed by a description of the research problems to be explored, the objective and question of the research. It continues with a brief clarification regarding on scope of the study and significant of study. Further and detail information was developed and discussed in Chapter 2.

## **Chapter 2**

### **literature review**

#### **2.0 Introduction**

In this chapter, the researcher will be described the theories and theoretical framework. A literature review is an objective, through summary and critical analysis of the relevant available research and non-research literature on the topic being studied (Hart 1998)

#### **2.1 Generation Y (Gen-Y)**

Brosdahl and Carpenter's (2011) said that he categorizes of generations using the following birth dates for each years: the Silent Generation are from 1925 to 1945, the Baby Boomers from 1946 to 1960, Generation-X from 1961 to 1981 and lastly Generation Y are born after 1981 until 1999. Generation Y members born between 1981 and 1999. There is not yet widespread agreement from previous research on the start and end points

for Generation Y. According to Prendergast (2009) said that the 'GI Generation' from 1901 to 1924, the 'Silent Generation' is between 1925 to 1942, the 'Baby Boomers' is between 1943 to 1960, the 'Generation X' is between 1961 to 1981, the 'Millennials or 'Generation Y' is between 1982 to 2002 and lastly the 'Generation Z' are from 2003 onwards (Prendergast, 2009).

Other researcher said that the generation Y are divided with individuals who were born between 1980 and 2000 (Weingarten, 2009). Millennials are also known to as gen-y (Howe and Strauss, 2003), generation of net (Shaw and Fairhurst, 2008) and next generation (Martin, 2005). Generation Y which includes people born between 1980 and 2000 (Eisner, 2005). According to Williams and page (2010), millennials is also known as Gen Y, Echo Boomers, Why Generation, Net Generation, Gen Wired, We Generation, DotNet, Next Generation, Nexters, First Globals, iPod Generation, and iYGeneration. The group of people was born between the periods of year 1977 to 1994.

From Department of Statistic Malaysia, in 2010, In year 2000, the population of Malaysia who categories below age 15 which is 33.3% but it decrease to 27.6% By contrast, the percentage of working age population from 15 to 64 years old are increased from 62.8% till 67.3%. Meantime, in year 2000, the percentage of population within age 65 years old and above increased from 3.9% to 5.1%. Eventually, the median age had increased to 26.2 years old in year 2010 from 23.6 years old in year 2000.

**Carta 8: Bilangan penduduk mengikut jantina dan kumpulan umur, Malaysia, 2000 dan 2010**  
**Chart 8: Number of population by sex and age group, Malaysia, 2000 and 2010**

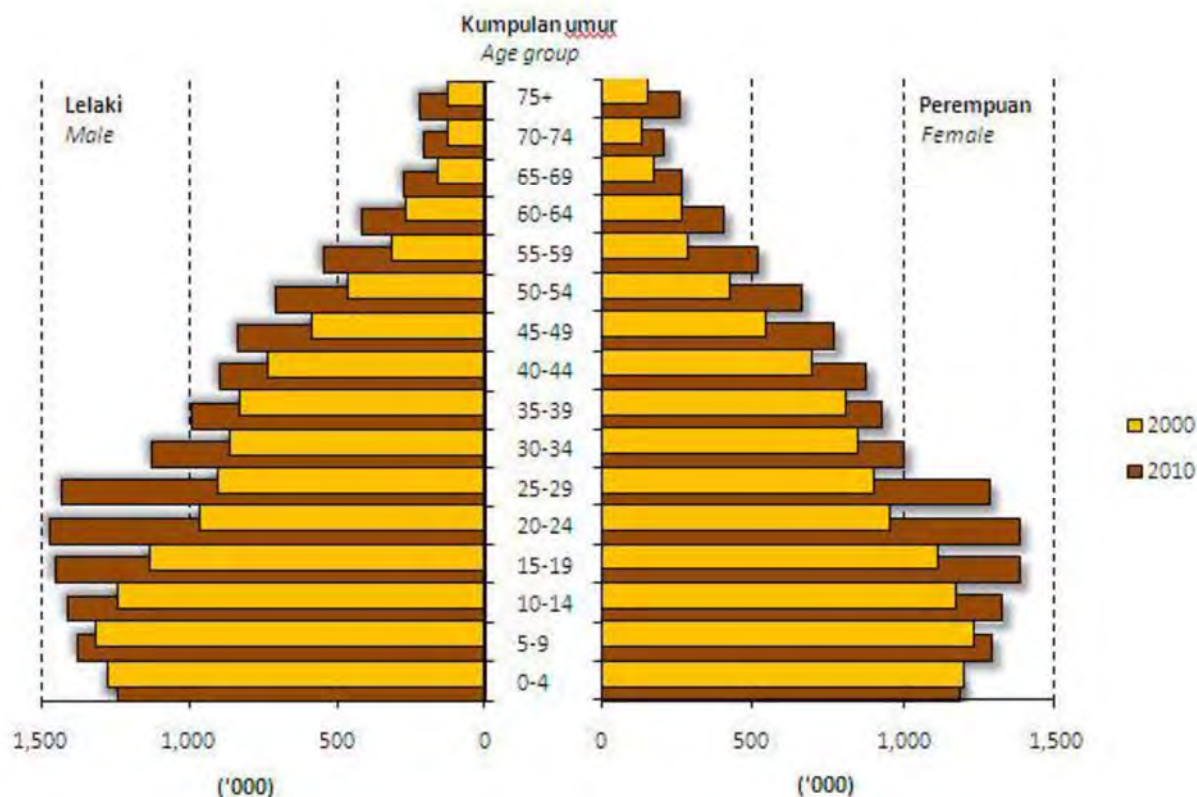


Table 2.1 : Sourced from official portal of Department of Statistics Malaysia

A key development of characteristic for Gen Y is early and conventional exposure to technology, which has benefits and risks in terms of cognitive, emotional, and social effects (Immordino-Yang et al., 2012). For instance, they rely vigorously on innovation for amusement, to cooperate with others, and notwithstanding for feeling control. Generation Y have encountered significant a long periods of economic prosperity until the preveious years and fast progress in communication, social networking, correspondence innovations and globalization (Park and Gursoy, 2012). The difference between Generation Y and past generations identifies with a shimmy in an incentive value on the part of Generation Y consumers from those of past generation (Hyllegard et al., 2011).

The members of Generation Y are trustful, more tolerant and better traveled in the world rather than their parents. Furthermore, this generation is very supportive on social causes and socially dependable organizations (Furlow, 2011). Gen Y was experienced childhood in a period of tremendous and quick change condition including basically loaded with utilize openings work environment, double salary families as the standard, extensive variety of family compose, critical regard for judicious number and social decent variety including a touchy on social perception, and have owned PCs in the home and schools (Williams and Page, 2010).

Gen Y likewise claimed singular identities like receptive, constructive reasoning, objective arranged, and profoundly energetic toward their own accomplishment (Williams and Page, 2010). The generation Y recognition and their inclination amid the learning procedure is an imperative point. On the off chance that somebody appreciates this stage, he typically gives careful consideration to the lesson. A typical classification course is normally made by an presentation or literature with someone responsible of clarifying the task (Martsch, M. 2013). AR is another innovation that have demand in more movement from the user than a presentation or reading material. Actually the person are need to be prepared to search for a object or image in real world to learn from. This action requests need to action some activity that should offer inspiration to finish the activity. (Martsch, M. 2013).

## 2.2 Augmented reality

Education content material can be experienced through a vast assortment of media. The users generally learned through association with teachers and peers, and through non-intuitive media, for example, textbooks and videos (Iulian Radu, 2013). The innovation in augmented reality will be increased and it is new which has numerous applications. Today it is utilized for a huge arrangement of capacities like craftsmanship, trade, training, development, gaming, mechanical outline and promoting. There are different kinds of units supporting Augmented Reality which are smartphones, tablets, PCs, eyeglasses, head-mounted presentations (A. Perdikakis, 2015). A standout among the most widely used of this technology are applications that can be installed on all assortments of tablets and smartphones.

They are generally used for publicizing and advertising anyway stand-out utilize is likewise conceivable. In the real world we can set a 2D image of a real object as the real world that we want to "augment". Thus we set the realistic/site/analyze data that we need to add to the picture. At the point when the integrated camera of the tablet or smartphone perceives the real object (when the computerized camera sees the same 2D picture that we have set for our application) we can find in our demonstration the photo with the additional data (A. Perdikakis, 2015). There are many potential advantages which augmented reality innovation can convey to students' lives, for example, more prominent excitement through whole body interaction (De Lisi R, Wolford JL, Billingham M, 2002), advance the education through in-site interactive perceptions and enhance the visualization and aptitude change through physical control (Merians AS 2002, Tang A, 2003).

Kaufmann (2007) said that when the students studying 3D structures using Augmented Reality versus a PC CAD software rated AR as widely more prominent and fulfilling than the PC program, despite the fact that the convenience of the AR programming used to be evaluated lower than the PC alternative. Augmented reality applications are mind-boggling mechanical encounters, conveying learning content through a medium not quite the same as non-AR experience. The advantages in learning impacts noted above are