THE POTENTIAL OF AUGMENTED REALITY IN EDUCATION: A REVIEW OF PREVIOUS RESEARCH

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INTRODUCTION

Relatively there are a lot of previous research that been conducted in Augmented Reality but, there are a few that been conducted in education fields. These numbers of research replicates fast due to the effectiveness of this technology in this past recent years. Augmented Reality had been used in Educations field which includes Medical, Chemistry, Mathematical, Physics, Geography, Biology, Astronomy, Language and History. Besides, mostly this technology is more widely used in other countries but not in Malaysia.

MAIN RESULT

This review is organized according to the fields of the studies which are Medical, Chemistry, Mathematical, Physics, Geography, Biology, Astronomy, Language and History. All areas list out in as a review can been used in evaluating the potential of Augmented Reality (AR) in Education. Besides, there is also AR advantages and limitations of Augmented Reality in Education had been discussed.

Table 1. Meta-analysis of the previous research conducted on difference fields.

Author	Fields	The Usage of Augmented Reality in Research
Chang et al. (2010)	Medical Education (Surgical Training)	AR to provide training, planning and guiding surgical procedures. The guidance is developed and represent by AR image-guided therapy.
Yeom (2011)	Medical Education (Anatomy)	Used AR to visualize interactive 3D anatomy pictures with haptic feedback to teach and test anatomy knowledge, of the abdomen in particular.
Hedegaard et al.(2007)	Mediacal Education (EKGAR project)	Determine whether AR can extend medical student's spatial awareness in relation to specific myocardial deceases.
Singal et al. (2012)	Chemistry Education	AR is used to provide efficient way in representing and interacting with the molecules which will lead to a better understanding of the spatial relation between molecules.
Cerqueira & Kirner (2012)	Mathematical	Applied AR on the topics of geometry which it is involves the three-dimensional geometrical concepts.
Coffin et al.	Biology	Used the AR in videoconferencing and tracked physical

(2008)		props such as frogs to be dissected.
Mathison and Gabriel (2012)	Biology (*School In The Park* (SITP))	Participants learn that habitats are connected like links in a chain which called a food chain by the experienced using AR.
More will be discussed in the full paper.		

Table 2. Advantages of using Augmented Reality in Education

Author	Advantages of Augmented Reality
Singhal et al. (2012)	- Supports seamless interaction between real and virtual environments and allows using a tangible interface metaphor for object manipulation.
Coffin et al. (2008).	- Provide instructors with a way to strengthen students' understanding in the classroom by augmenting physical props with virtual annotations and illustrations.
Burton et al. (2011)	- Allows a learning experience that is linked to the formal classroom, so that students can learn outside of class hours and outside of school limits
(Medina, Chen, & Weghorst, 2008)	- Visualize interactions among amino acids and protein building processes as static 2D/3D images and 3D dynamic images (animations)

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