EARLY CHILDHOOD EDUCATION FLASHCARD USING AUGMENTED REALITY

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EARLY CHILDHOOD EDUCATION FLASHCARD USING AUGMENTED REALITY (TRANSPORTATION)

NUR FARHANAH NADIAH BT AB MALIK

This report is submitted in partial fulfillment of the requirements for the Bachelor of Computer Science (Media Interactive)

FACULTY OF INFORMATION AND COMMUNITCATION TECHNOLOGY

UNIVERSITI TEKNIKAL MALAYSIA MELAKA

2016

DECLARATION

I hereby declare that this project report entitled

EARLY CHILDHOOD EDUCATION FLASHCARD USING AUGMENTED REALITY (TRANSPORTATION)

is written by me and is my own effort and that no part has been plagiarized without citations.

STUDENT : _____ DATE: 11/8/2016

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I hereby declare that I have read this project report and found this project is sufficient in term of scope and quality for the award of

Bachelor of Computer Science (Media Interactive) with Honours

SUPERVISOR : _____ DATE: 23/08/2016

(EN SHAHRIL BIN PARUMO)

DEDICATION

This dissertation is dedicated first and foremost to myself. I never expected I could do this far. To all those who have supported, encourage me through to come at this point especially Raja Alif Fikri bin Raja Idris and my beloved parents Zaiton bte Md.Dan and Ab Malik bin Abu, for all their love, patience, kindness and support.

"Where there's a will, there's a way."

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ABSTRACT

In general, this project is a Flash card application to apply the technology of "Augmented Reality" that focus on visual experiences, displayed through input devices such as a camera. Learning will be interesting to use 3-D element. This application is designed for children age of 3, where they are going through a phase recognizing object. Most flashcard application that available in market now are mostly consist of 2-D image and doesn't have specific application using "Augmented Reality" technology. Therefore, this application will assist the development of children's brains to recognize the object in better ways using graphics, audio, sound effect, animation and 3-D object. Hence, the child will be more inclined towards learning by using this application compared to existing learning techniques.

ABSTRAK

Secara amnya, projek ini merupakan aplikasi untuk kad imbasan yang menerapkan teknologi “Augmented Reality” yang menumpukan kepada pengalaman visual, dipaparkan melalui peranti input iaitu melalui kamera. Pembelajaran akan menjadi menarik dengan menggunakan elemen tiga dimensi. Aplikasi ini adalah direka bentuk untuk kanak-kanak berumur tiga tahun, ketika mereka sedang melalui fasa mengenali objek. Kad imbasan yang sedia ada masih lagi mempunyai banyak kelemahan, kerana kebanyakannya terdiri dari gambar dua dimensi sahaja dan tiada lagi aplikasi untuk telefon bimbit yang menggunakan teknologi “Augmented Reality”. Justeru itu, aplikasi ini akan membantu perkembangan otak kanak-kanak untuk mengenali objek dengan lebih baik. Dengan menggunakan grafik, bunyi, animasi dan juga objek tiga dimensi. Oleh itu, kanak-kanak akan lebih cenderung ke arah pembelajaran yang di bantu oleh aplikasi ini berbanding teknik pembelajaran yang sedia ada.

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Early Childhood Education Flashcard using Augmented Reality (Transportation) are a new way to interact and make flashcards more entertaining for toddlers and preschooler. Through the usage of Augmented Reality (AR) and flashcards, allows children to enhance their learning skill and also attract them for learning session. Introducing the fun and interactive learning technique could grab the attention which improve way of teaching and learning for young learner. Using an augmented reality to develop the passion of learning and put some different presentation of expressing what they have been learn. With media elements such as animation and sound, which will attract toddlers as well as features can enhance their minds. With AR flashcard, learning become fun and exciting.

Prior to the commencement of compulsory education in primary school, a preschool is an educational establishment offering early childhood education to children between the ages of three to four years old. For them using the flash cards for kids can develop learning skills for toddlers aged 3 and up. However, it is hard to attract the attention of children with only using flashcards without any additional interactive element. It is found out that children prefer combinations of multiple media element which includes animation where it will automatically attract their attention. So developer decided to added some media element and design that will enhance their learning skills.

2.2 Problem Statement

There are few problems that occurs to some children who is lacks of ability to imagine thus their mind are limited. Since most of toddlers attracted to moving pictures and visual medium, augmented reality (AR) can be used to enhance their imagination with the learning material and skills. Moreover, augmented reality (AR) is mostly integrates 3D models animation almost likely those they watch every day on television which can make children will attract to this features without the hassle of forcing them.

2.3 Objectives

The objective of this project is to study the use of Augmented Reality (AR) to enhance learning skills for toddlers, to design a 3D modelling and develop an application in Augmented Reality and also to test effectiveness using Augmented Reality flashcard in learning environment which is mainly aimed for children below 4 years old.

2.4 Project Scopes

In this project studied to determine how the children's learning can be affected by augmented reality. Children also play an important role in this project to investigate the effectiveness and usefulness of Augmented Reality. Thereby, children from three to four years old are the main target of this project.

2.5 Project Significance

This study can be a factor for learning in Early Childhood Education. By utilizing this tool, the objective of analyzing the potency of Augmented Reality Technology in Education might be achievable. It does not say that will be work on all the children but with this tool will facilitate or assist them in learning. Learning process will be extra variability, multi-sensory and more relatable with Augmented Reality.

2.6 Conclusion

The project background describes the introduction of the project whole. From the problem statement describe why this project should be developed. And also the objectives of the project can be extracted. The scope of the project explains target user of the project. The target of this project is about early childhood education which focuses on recognition of Transportation 3D model using flashcard in Augmented Reality.

CHAPTER II

2 LITERATURE REVIEW & METHODOLOGY

2.1 Introduction

Flashcards is a set of cards bearing information, as words or numbers, on either or both sides, used in classroom drills or in private study [1]. Its use for exercise the mental process of active recall, which given a prompt, and one produces the answer. Combination of AR and flashcards are changing the way children learning experience. With the technology of augmented reality, these flashcards become interactive. Those attractive 3D models keep children engaged for longer periods of time. Its new unique way to get children involved in learning process. While concept of Augmented Reality (AR) is a live direct or indirect view of a physical, real-world environment whose elements are augmented by computer-generated sensory input such as sound, video and graphics.

AR displays can be rendered on electronic devices which equipped with a camera to intercept the real world view and re-displays its augmented view through the display of the device itself [2]. Between Augmented Reality and Virtual reality have no big difference because the concept almost the same. When talk about AR, it is a blending of virtual reality and a real life while Virtual Reality is about users can interact with the creation of a virtual world. According to it an AR, users can interact between the two of virtual content in real world or distinguish both of it.

2.2 Area of Study

Learning of Early Childhood Education area of study for this project is supported by Augmented Reality technology. Along with this project, readers are able to interact with the application where it allows children to scan images (marker) using flashcard in interactive ways. Parallel to the target user for this learning tool, it catches their attention with 3D objects adding up some of multimedia elements will let them assimilate with various ways and techniques.

2.2.1 What is Augmented Reality (AR)?

Augmented Reality (AR) embeds digital information into real world contexts. It can be explained as the generation of a composite view for the user that is the combination, in real time, of a real scene viewed by the user, via a camera for example and a virtual scene generated by the computer, therefore augmenting the scene with additional information. There is two technique involves in AR, marker-based and marker-less.

Marker-based AR uses a camera and a visual marker to determine the center and range of its spherical coordinate system. The applications using markers are based on open source technology. While marker less tracking are currently one of the best of technology for tracking. It performs active tracking and recognition of real environment on any type of support without using special placed markers.

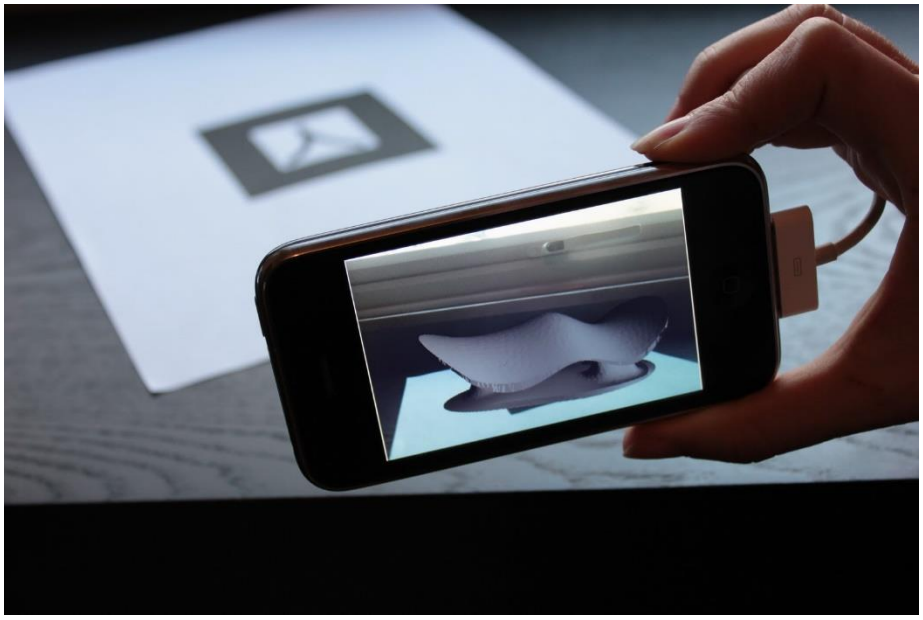

Figure 2.1: Marker based camera AR

Figure 2.2: Marker-less based camera AR

2.2.2 AR in Education and Classroom

Technologies that make it possible have been around for quite some time only by using Augmented Reality (AR) together with the growing popularity of mobile platforms. In AR developments shows the potential giving impact in learning, creative inquiry and education. Moreover, content from AR can be viewed in various ways, such as view quick response codes through their webcam. By using QR codes (markers), digital information including 3D animations can be attached to images on paper, cards and other surfaces. Beside that AR has that potential that engage and motivate students to explore more for class materials from different angles.

Figure 2.3: Differences between using AR and without using AR

Students can gain better understanding of the concepts of their study just by viewing the augmented models. This is a fun way to stimulate or engage students and reinforce the concepts they have seen during class lectures. In addition, these learning materials won't get worn down or lose their relevance and got misplaced. They also can access the AR apps from any device at any time anywhere.

2.2.3 Learning Environment using Flashcards

Learning environment using flashcard need a good and creative teacher that know how to make student more attract and stimulate with the way they teach them. For example, the teacher need to create some suspense or mystery about the flashcard or picture cards. It will make the student more receptive to learn when they are curious. Moreover, rather than just flipping through the cards and having students repeat the words, the teacher also can change cards flipping into activities. Flashcards can be a great way to introduce new vocabulary, recognition of an object and many more for young learner.

2.2.4 Guidelines to developed Flashcards

Teaching young children could be difficult task. The purpose of making flashcards is to be able motivate them and feeling attracting to the learning materials.

- **Paper Weight**

For hold up well, at least typical name card about 250gsm for ideal weight.

- **Paper Size**
  - Schichida method – A5 or B5 cards
  - Glen Doman word cards – “6” x 22 “
  - Glen Doman Bit (Bits of Intelligience) Cards – 11″ x 11″

- **Ideas for Content**

Deciding the content to put in flashcards, such as Words, Maths, Colours and Concepts, Name of Things or Nursery Rhythms.