

# Teaching ADHD Kids using Augmented Reality

Mohd Azmidi Abdullah

Department of Computer and Information Sciences,  
Universiti Teknologi PETRONAS  
Bandar Seri Iskandar, Tronoh Perak, Malaysia  
[midix90@gmail.com](mailto:midix90@gmail.com)

Dr. Dayang Rohaya Awang Rambli

Department of Computer and Information Sciences,  
Universiti Teknologi PETRONAS  
Bandar Seri Iskandar, Tronoh Perak, Malaysia  
[roharam@petronas.com.my](mailto:roharam@petronas.com.my)

**Abstract**— Teaching ADHD Kids Using Augmented Reality (ADHD-Edu) is learning software for Attention Deficit Hyperactivity Disorder (ADHD) children in pre-school by using augmented reality (AR) approach. By combining AR with current teaching tools such as computer and projector, learning environment will completely change into a new dimension. ADHD – Edu will help ADHD children getting as much input as possible compare to current teaching tools which are not compatible with their ability. With the interactive module in this software, ADHD children will learn effectively despite of their hyperactive behavior.

**Keywords:** ADHD, Augmented Reality

## I. INTRODUCTION

Attention-deficit/hyperactivity disorder (ADHD) is a developmental, neurological condition defined by the presence of severe and pervasive symptoms of inattention, hyperactivity and impulsivity [1]. Screening for hyperactivity and inattention (the major symptoms of ADHD) in a community survey amongst Malaysian children and adolescents between the ages of 5 – 15 years showed a prevalence rate of 3.9 %. ADHD is three times more likely to occur in males. It is more common in males compared to females [3].

Children with a diagnosis of attention-deficit/hyperactivity disorder (ADHD) usually present with a wide range of characteristics and problems including academic underachievement and learning disabilities. In fact, it has been estimated that approximately 80% of children with ADHD experience academic underachievement and approximately one-third of children with ADHD have specific learning disabilities [8] [6].

ADHD can't be cured. One method having been used to help ADHD relieved is stimulant medications making use of Ritalin, Dexedrine, Cylert. The other is behaviour therapy based on several simple and sensible notions about what leads children to behave in socially appropriate ways. But both two methods have some following disadvantages; side-effects (Ritalin can cause a cancer of liver [17]), needs of much time and efforts from many persons concerned. To overcome these disadvantages, we

developed the learning system using Augmented Reality (AR) technology.

## II. LITERATURE REVIEW

ADHD is a disorder in which a person has a difficulty to learn effectively, caused by the disorder that affects the brain's ability to receive and process information [7].

Augmented reality (AR) is related to the concept of virtual reality (VR). Both of the concepts enable a person to experience and explore interactively, predominantly through his or her sense of vision, but also via studio, tactile and other forms of feedback. The main point that differentiate between both of them is VR attempts to create an entirely artificial environment while AR aims to blend the virtual objects into the real world [13].

AR systems can either be marker-based or markerless-based. Marker-based applications are comprised of three basic components which include a booklet for offering marker information, a gripper for getting information from the booklet and converting it to another type of data, and a cube for augmenting information into 3D-rendered information on a screen. On the other hand, markerless-based applications need a tracking system that involves GPS (Global Positioning System), a compass, and an image recognition device instead of the three elements of maker-based systems. Markerless applications have wider applicability because they function anywhere without the need for special labelling or supplemental reference points [20].

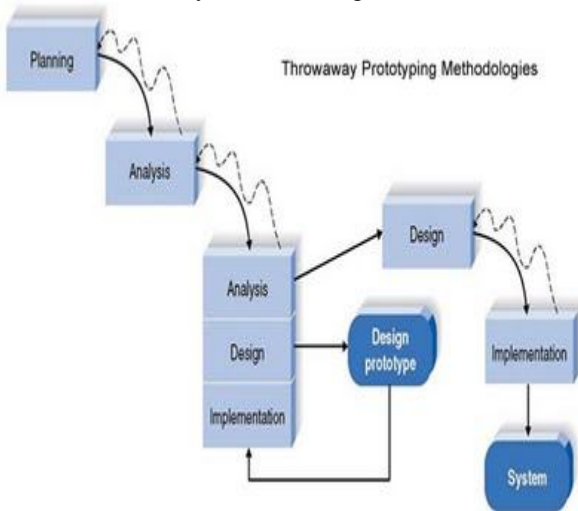
## III. METHODOLOGY

### A. Research Methodology

The project will be using Throwaway Prototyping that is falls under the rapid application development (RAD) based methodology. Throwaway prototyping based methodology is similar to prototyping methodology with difference that it will be done at different phase of system development life cycle (SDLC).

Throwaway prototyping is basically intended to help users to visualize how the module looks after it being built. This type of methodology is also known as Dummy (mock-up) prototype as it will be a presentation before implementing the real finish module. The phases of this methodology are based on system development life cycles which consist of 4 phase which are planning, analysis, design and implementation. As for throwaway prototype, it will relies on few design prototypes during the analysis and design phases before continue with the implementation phase.

- (1) that are both close and open ended
- (2) Reference made through books, journals, magazines, research papers and form research made in the internet. The method used for the research is Descriptive Research where it describes data and characteristics about the population or phenomenon being studied. Descriptive research answers the questions *who, what, where, when, "why" and how*. In this research, primary and secondary data are being used.



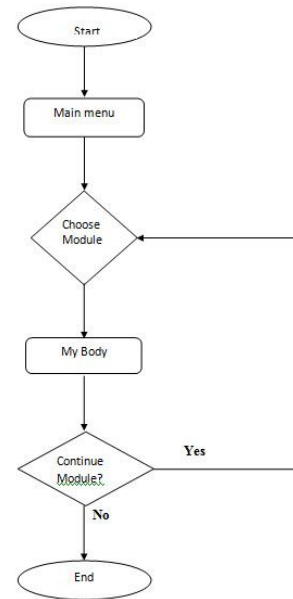
### B. Tools and Equipments

The hardware and software specifications of this project include

- **AR development**
  - BuildAR Pro
- **Hardware**
  - PC
  - Webcam or digital camera
- **GUI**
  - Netbeans 6.8

## IV. RESULT AND DISCUSSION

### System flowchart



## V. CONCLUSION

This project is helping children with ADHD to learn and understand what have been taught by teacher. Pre-school children are the target because at this stage the children with ADHD start to exhibit the symptoms. This project is not meant to cure the ADHD children but to help them understand and not left behind in class. With the learning module according to pre school curriculum ADHD-Edu will improve their academic performance and overcome the disabilities.

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