THE DESIGN PRINCIPLES OF EDUTAINMENT SYSTEM FOR AUTISTIC CHILDREN WITH COMMUNICATION DIFFICULTIES

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THE DESIGN PRINCIPLES OF EDUTAINMENT SYSTEM FOR AUTISTIC CHILDREN WITH COMMUNICATION DIFFICULTIES

Thesis submitted to Dean of Awang Had Salleh Graduate School in Partial Fulfillment of the requirement for the degree Master of Science in Information Technology

Universiti Utara Malaysia

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Abstract

The number of children with autism is increasing worldwide. Children with autism face three major problems; socializing, communicating, and behaviour. Approximately 50% of all individuals with autism have difficulties in developing functional language owing to communication deterioration. Mobile devices with installed educational games help these individuals feel more comfortable and relaxed doing such activities. Although numerous mobile applications are available for individuals with autism, they are difficult to use; particularly in terms of user-interface design. This study analysed the existing apps in order to determine the design principles applicable to the Edutainment App being studied. Five applications were involved in this analysis. As outlined in the objectives of this study, identifying these design principles is important in designing the app. The analysis identified fifteen suggestions for the design principles. These suggestions addressed, simple interfaces; image size; number of pictures; home page icon; colour; having images identical to real life objects; the use of caregivers; navigation; password-protection; audio appropriate to the images; the app language used; evaluating parameters to measure the child’s growth; option for photo loading; PECS-based communication; and sentence pronunciation function. These recommendations are offered by this study towards designing and developing a prototype app for autistic children. This study introduces an edutainment-system design principle formulated to help develop the communication skills of children with autism-spectrum disorders. This study also describes the design, implementation, and evaluation of the ICanTalk app—a mobile edutainment app that can be used to improve users’ understanding and communication skills and help them to connect with society and the surrounding environment particularly for autistic children with communication difficulties. This app allows caregivers to create personalized content using pictures and audio on their mobile devices (tablets). The evaluation of the app by teachers suggests that it is useful and easy-to-use. In conclusion, based on the evaluation results, it is found that the ICanTalk app is effective in helping autistic children with communication difficulties.
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CHAPTER ONE
INTRODUCTION

1.1 Introduction
This chapter explains the disability of children with Autism in general and the assistive technology provided through the mobile device. It also provides the definitions of Autism spectrum disorder and Edutainment Apps. Besides, it discusses the state of the existing apps for autistic children.

1.1.1 Disabilities of Children with Autism
Throughout the world, there has been an increase in the number of children with disabilities (Dandashi, Alja’Am, & Saleh, 2013). At present, more than a billion people (or approximately 15% of the global population) are living with disabilities, and this number includes children (Kbar & Aly, 2014). Disability thus impacts society because families of disabled individuals are part of, and interact within, the society (Lee, Choi, Song, & Shin, 2014).

The global Education For All (EFA) and UN Convention on the Rights of Persons with Disabilities stressed the importance of education for people with disabilities and thus they encouraged the development of an approach to educate them (Lehtomäki, Tuomi, & Matonya, 2014). According to the Portuguese Child Support Institute, children can develop abilities, such as evolving attention skills, strengthen the memory, advancing and expanding imitation and imagination, through playing (Proença, Quaresma, & Vieira, 2014). This means that playing is an essential part of learning. Without incorporating play, learning can become abusive and cruel (Stasolla, Caffò, Picucci, & Bosco, 2013). One wrong belief is that children with disabilities are incapable of playing. The truth is that such children could play, only in a manner differs from
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