KIT ALAT PENDIDIKAN AUGMENTED REALITY UNTUK ANAK-ANAK DENGAN CACAT BELAJAR DALAM KEMAMPUAN TULISAN TANGAN DAN KEMAMPUAN MOTOR HALUS

SKRIPSI

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PROGRAM STUDI TEKNIK MULTIMEDIA DIGITAL

JURUSAN TEKNIK INFORMATIKA DAN KOMPUTER

POLITEKNIK NEGERI JAKARTA

2022

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AUGMENTED REALITY EDUCATIONAL TOOL KIT FOR CHILDREN WITH LEARNING DISABILITIES IN HANDWRITING ABILITY AND FINE MOTOR SKILLS

By

ABDUL HAFIDZ ALIFUDDIN

Project Submitted in Partial Fulfillment of the Requirements for the Degree of Bachelor in Creative Multimedia (Hons.) in the Faculty of Information Sciences and Engineering

May 2022

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ABSTRACT

ADHD (Attention-Deficit/Hyperactivity Disorder) is a variety of learning disabilities caused by a deficit in neurotransmitters and frequently found in school-age children caused by a shortage in neurotransmitters. Neurotransmitters play a significant role in the regulation of attention and concentration. Children with learning disabilities, ADHD in particular need educational tools to make it easier for teachers and children to communicate during learning. This is because children with learning disabilities tend to focus on many things, so the teacher has difficulty giving directions for learning. Handwriting and fine motor skills are some of the basic lessons that are difficult to learn with learning difficulties, especially ADHD, with learning difficulties in children being the main challenge in educating children with ADHD. To fulfill the objective of this project, the research methodology that will be used is the ADDIE Model. ADDIE Model is a model that involves the stages of model development with five steps/development phases including Analysis, Design, Development or Production, Implementation or Delivery and Evaluations). The ADDIE model was developed by Dick and Carry in 1996 to design learning systems. All systems in the application work fine. The application is considered easy to use and can help children's learning with a percentage above 80%. The interface design of the application is considered suitable for use by children, and the color selection is also appropriate. Overall, this application can help the learning process of children with ADHD and can be used as an alternative learning method.

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CHAPTER 1

INTRODUCTION

1.1 PROJECT BACKGROUND

Children with learning disabilities often have difficulties in learning, both in the form of difficulty communicating, losing focus, and feeling bored quickly, thus depending on the variety of learning disabilities in each child.

ADHD (Attention-Deficit/Hyperactivity Disorder) is a variety of learning disabilities caused by a deficit in neurotransmitters and frequently found in school-age children caused by a shortage in neurotransmitters. Neurotransmitters play a significant role in the regulation of attention and concentration.

Children with learning disabilities, ADHD in particular need educational tools to make it easier for teachers and children to communicate during learning. This is because children with learning disabilities tend to focus on many things, so the teacher has difficulty giving directions for learning. Handwriting and fine motor skills are some of the basic lessons that are difficult to learn with learning difficulties, especially ADHD, with learning difficulties in children being the main challenge in educating children with ADHD.

Augmented Reality (AR) is the latest technology that can be applied to educational toolkits, to provide immersive value in learning. Augmented Reality (AR) is an application that combines the real world with the virtual world in the form of 2-dimensional and 3-dimensional projected in a real-time environment simultaneously (Mustaqim & Kurniawan, 2017). AR-based educational toolkits can provide a direct perspective of the physical environment in real-time, which has a distinct advantage because children can interact with the environment thanks to the powerful multimedia elements in AR.

After all, children with ADHD is the same children as others, who should be treated the same way, especially in terms of education. This research aimed to help educators and children with learning disabilities, especially ADHD to refine handwriting and fine motor skills. Delivered using AR based educational toolkit which is believed to be more attractive to children.

1.2 PROBLEM STATEMENT

Understanding related learning methods of children with learning difficulties in terms of fine motor skills. and Creating an AR-based educational toolkit for children with ADHD requires an appropriate approach and research. Specifically, in the mechanism and features of the application according to the behavior of children with learning disabilities.

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1.3 OBJECTIVES OF THE PROJECT

A research study designed to increase handwriting ability and fine motor skills with educational toolkit for children with learning disabilities, had the following specific objectives:

1. To find out the understanding of children with learning difficulties in terms of fine motor skills.
2. To determine the suitable and appropriate educational tool kit to support children with learning disabilities in terms of fine motor movements based on augmented reality.
3. Propose alternative learning media with augmented reality-based educational tool kits for children with learning disabilities.

1.4 SCOPE OF THE PROJECT

The scope of this study is limited to children with ADHD aged 7-12 years. This study is limited to children in the Shah Alam region where the responses of 30 children of Sekolah Kebangsaan 13, Shah Alam will be studied during the interview session. The content that will be testing materials is an introduction to the letters of the alphabet, simple words along with pronunciations, and how to write those words.

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1.5 SIGNIFICANCE OF THE PROJECT

Via this study will be possible to identify specific difficulties for children with ADHD in learning to write and determine the appropriate educational augmented reality features. Based on these findings, it can help design the right educational toolkit for children with ADHD, especially in learning to write handwriting.

1.6 ASSUMPTIONS AND LIMITATIONS

In conducting this research, several assumptions were made, namely:

1. Improving the quality of education, especially for children with learning disabilities.
2. Facilitate teachers and parents in the learning process to improve the development of children with ADHD.
3. Become an alternative learning media, replacing conventional learning.

The samples studied were children with learning disabilities, so that the research focused on the subject following the research objectives. The results available based on this study may not applicable to children outside the research designation.

Researchers have never studied the behavior and characteristics of children with ADHD, therefore knowledge regarding the behavior and characteristics of children with ADHD will be limited.

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CHAPTER 5

SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1 SUMMARY

Children with learning disabilities often have difficulties in learning, both in the form of difficulty communicating, losing focus, and feeling bored quickly, thus depending on the variety of learning disabilities in each child.

ADHD (Attention-Deficit/Hyperactivity Disorder) is a variety of learning disabilities caused by a deficit in neurotransmitters and frequently found in school-age children caused by a shortage in neurotransmitters. Neurotransmitters play a significant role in the regulation of attention and concentration.

This study tries to find new learning methods for children with ADHD. By using technology, especially Augmented-Reality-based applications combined with Flashcards, it is hoped that it can be a solution to the inadequate learning methods for children with ADHD.

The ADDIE Model research method is being used in order to hopefully produce the results that are expected and can be a new way of learning. In addition, this research was also conducted using a qualitative design, assisted by questionnaires and interviews, to collect data. This will allow the results to be more concrete and relevant to real-world needs.

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5.2 CONCLUSION

After looking at the data from the questionnaire results and has been processed using Application Usability Testing (AUT), it can be concluded several points:

1. All systems in the application work fine.
2. The application is considered easy to use and can help children's learning with a percentage above 80%.
3. The interface design of the application is considered suitable for use by children, and the color selection is also appropriate.
4. Overall, this application can help the learning process of children with ADHD and can be used as an alternative learning method.

5.3 RECOMMENDATIONS

Based on the final year project results, there are several things that can be added to make this application more effective. Therefore, this application requires several things that can be suggested as follows:

1. When user point's the AR camera at the flashcards, it would be better if the 3D objects that appear have more vibrant color palette and animations to make them more attractive and easier for children to understand.
2. There needs to be a feature to provide a brief introduction to Alphabet and a mini-game to add to the appeal of the app.

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