



UNIVERSITI TEKNIKAL MALAYSIA MELAKA

**DESIGN AND DEVELOPMENT OF INTERACTIVE
CHILDREN EDUCATIONAL ANDROID MOBILE
APPLICATION**

This report is submitted in accordance with the requirement of the
Universiti Teknikal Malaysia Melaka (UTeM) for the Bachelor of Mechanical
Engineering Technology (Automotive) with Honours.

by

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APPROVAL

This report is submitted to the Faculty of Mechanical and Manufacturing Engineering Technology of Universiti Teknikal Malaysia Melaka (UTeM) as a partial fulfilment of the requirements for the degree of Bachelor of Mechanical Engineering Technology (Automotive) with Honours. The member of the supervisory is as follow:

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ABSTRAK

Projek ini bertujuan untuk digunakan dalam sektor pendidikan. Sistem ini lebih bertumpukan kepada sistem pendidikan awal kanak-kanak di mana projek ini dapat membantu para ibu bapa untuk memberikan pendidikan secara tidak formal kepada kanak-kanak menggunakan sistem teknologi terkini. Disamping itu, projek ini juga dapat memberikan bantuan kepada kanak-kanak tersebut untuk belajar sambil bermain yang bertujuan untuk merangsang otak kanak-kanak tersebut agar lebih cerdas disamping membantu ingatan kanak-kanak dalam mengenali nama sesuatu benda melalui grafik-grafik menarik dan juga melalui ciri-ciri praktikal mandiri yang telah diimplimentasi dalam projek ini. Sistem ini adalah sejenis aplikasi yang berdasarkan sistem pengoperasian Android dimana sistem ini direka untuk digunakan dalam telefon pintar agar dapat membantu memberikan akses mudah kepada pengguna. Melalui sistem teknologi pembelajaran melalui applikasi telefon pintar sebegini diyakini dapat memberi impak yang besar dalam pembangunan mental dari segi pendidikan awal kanak-kanak secara tidak formal

ABSTRACT

This project is intended for use in the educational sector. The system is more focused on the early childhood education system where this project can help parents to apply informal education to children using the latest technological system. In addition, the project can also help children to learn while playing which aims to stimulate the kid's brain to be more intelligent as well as to help the child's memory in recognizing the name of something through interesting graphics as well as through the self-contained practical features that have been implemented in this project. This system is an application based on an Android operating system where the system is designed for use in smart phones to help provide easy access to the user. Through the learning technology system using this smart phone application, it is possible to make a big impact on mental improvements in informal early childhood education.

DEDICATION

Special dedication to my beloved family, my parents, sibling and also friends who have supported me all the way and gives me alot of encouragements to help me deal with all the challenges in completing my final year project successfully. Besides, special gratitude for my supportive supervisor Mr. Noor Mohd Ariff bin Brahin who also gave me lots of attention and guidance throughou the project implementation. Thank you.

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CHAPTER 1

INTRODUCTION

1.1 Introduction

This chapter explains about the overview of the study and the main purpose of the project. This chapter includes project background, problem statement of that showcase the reason why this innovation was invented, objectives that fulfil the needs of the project to overcome the problem statements with goal at the end of the project and the scope of the study that will be conducted throughout the journey in inventing this project.

1.2 Project Background

This android based smartphones educational mobile application is designed to help children in their early childhood education. This application basically will help them recognize the name of the things around them interactively, not only in their native language but they also can explore many languages that are available in this application. This will help the mental development of the child in leaning new languages as we know that child are very capable to learn language faster that adult and this is one of the application that can help them stimulate their brain to ensure the learning process is initiated and consistent. After that, we also implement the use of camera in this application which will help the seeing sense of the child and stimulate their brain as well as helping them to remember a lot of real things compared to only when they see the things inside the books. This will very much help to simulate the child senses so that they will be more aware with their environment and also learn new things faster.

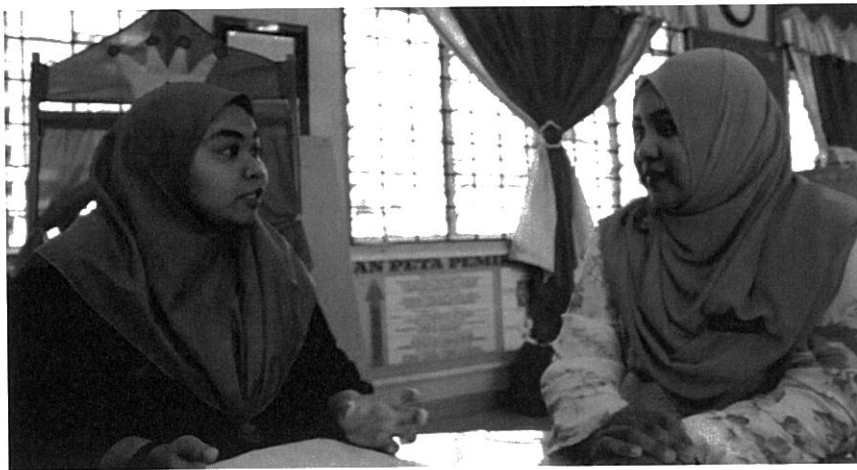


Figure 1. 2 Interview session with Pre-School Teacher

In addition to help make sure that this upcoming android smartphones will be very helpful for the children educational environment, a few preschool and kindergarten were involved in the research process. The preschool involved includes SK Tun Sas and Tadika Awlad Imtiyaz. Based on the surveys and interviews conducted, shows that children nowadays in preschool have no access to the technology due to the lack of quality that were provided in the existing children educational mobile application in the Google Play Store. Furthermore, the feedbacks from teacher of both kindergarten and preschool mostly emphasis on the lack of interaction occurs between the children with their environment when they are allowed to use the existing mobile application. This problem come across due to the lack of interactivity that the existing mobile application offers for the child in order to give inputs in their educational activity. These are the factors that helps prove that this interactive mobile application that will be developed that promotes this kind of learning process will helped the children to improve their growth and development because they were having fun at the moment them playing with the mobile application The research on the syllabus for kindergarten and pre-school also have been done to ensure that features in this android

educational mobile application are aligned with what they learned in school for maximum impact in their educational system and environment.

1.3 Problem Statement

Child always get bored faster when they try to learn something new. This is due to the condition where there are not allow to do active learning while using the available gadget at home. This situation will be worst when they could not even see the real things of what they are learning physically instead just get to see only the picture drawn by the author and this will drive them to get bored when they try to learn new words or new things and even new languages. This will results in the failure in the transition of information to the child brain as they will refuse to study as they often feel bored and this will result in the slow pace of mental development of the child themself.

After that the uses of E- learning disregards the space- time barrier of people's contact to realize communication everywhere and at any time without being present, besides to overcome social barrier in real world in order to make people communicate freely, in terms of social status, life style, cultural background. This kind of study can help communication more well-organized, convenient and pleasant. As we all know, nowadays people practice more one this kind of unrestricted network study based on the attractiveness of E- learning. (Mortaza, 2013). Besides, E – learning that are available nowadays also contribute to gadget addiction while stimulating the child brain to be an anti-social person which will contribute to the unhealthy growth of the children.

After that, studies also shows that modern technologies such as smartphones, tablets, and computers are widely developed and become increasingly wide-ranging over the

past decade to be beneficial and to create health risks for children. It seems that children's incorrect use of such technological devices in terms of content, duration, frequency, and the posture they implement while using them stance a variety of health risks, including developmental problems, musculoskeletal problems, physical inactivity, obesity, and insufficient sleep quality. This study analyses the writings on the clinical problems that digital technology use has on children. (Rustem, Emrah, Zeynal & Arzu, 2018). This is due to the lacking of interactive features presents in the mobile applications that are available in markets.

Moreover, while e-learning can be quite interactive these days, through the use of video conferences as medium of communications, webinars that allows child to hear the lectures from teachers online, and face-to-face video call, it still isn't the similar as sitting across the room and learn from the real teacher. Basically, there is no substitute for the face-to face learning that are eligible besides directly from human for now. (Jordan James, 2018). Along with that, supposedly in school, children also need to have interaction with the surrounding in order for them to use their highest brain function for a better child development instead of just receiving passive input from the e-learning application. This could not happen because actually most of the content that are available on the E-learning application in the market are mostly not aligned with what children learn and their syllabus in school and this what make it so hard for the teachers use the new technology of E-learning in their teaching method.

Lastly, as a platform of E-learning for children, which means the android mobile application will be used by the children themselves, security is the most important things that need to be emphasize in the features of the android mobile applications. Most of the available mobile application in the market are using the IoT (Internet of Things) which actually interact with the Internet worldwide to retrieve data that are given to the children

and this will result in the interchanges of information from the user's device onto the Internet. This will result in the exposure of internal data into the outside world which are not compatible to the users that are categorized as children as there might be inappropriate data that can be exposed into the outside world and also there will be some additional ads which can be unsuitable for children to watch will be shown in the mobile application.

1.4 Objectives

The main objective for this project is to design an interactive educational mobile application for children at the age of four to six years old with the implementation smart phone's camera. This project will also carried out on the following objectives:

1. To study Tensorflow machine learning platform for image classification
2. To develop an interactive children educational mobile application using image classification with Tensorflow machine learning platform.
3. To analyse the accuracy of the image classification implemented on the mobile application.

1.5 Scope of Project

Child The project's scope for implementation are establish based on the objectives that have been stated above. This project basically to provide E-learning android application for children use. This E-learning system is built using Android Studio with integration of Artificial Intelligence (AI) by using machine learning technique includes TensorFlow as the image training medium for this android application.

The image will be detected by the camera provided in the android smartphones and the data is processed and comparison are made in the application itself with the help of the

TensorFlow which is the AI component for this project that provide image training to the android application. The image training will actually done in PC by using TensorFlow by training the application to recognize all of the images inserted in every angle specified to obtain the correct results and to provide accurate answer to the user.

The mainly focused of this application is to provide an interactive E-learning application for children to allow them to learn things by interacting with their surroundings to obtain active learning environment. This application will emphasise the brain development of the children to be more alert and open their vision towards the things that evolved within their environment and simultaneously helps to stimulate their brain development towards a better growth.

1.6 Organisation

Chapter one is basically a brief introduction on the problem, objective and scope of the project. After that, in chapter two show the literature review that mainly discussed the literature on existing methods and technologies implemented in previous projects that have been reviewed. The comparison regarding the pros and cons of the project will also be done at this chapter. Moreover, in chapter three will be the description on the components and methods that are planned to be used in the project will be stated and reviewed. Furthermore, an overview of the project based on the flowchart will be shown in this chapter. Next, the findings of the project that comprises of project analysis and project hypothesis will be illustrate and discussed in chapter four. Lastly the conclusion of this research project and future recommendation will be analysed and considered in the final chapter of this project which is the chapter five.

1.7 Summary

In conclusion, this chapter mainly discussed on the introduction to the idea of making this project. This project were discussed into divided parts such as problem statements, objectives of this project, scope of project where the overview of the project have been discussed. Lastly, the organization of the project also been discussed in this chapter that will a helpful part to organize the structure of developing this project.

CHAPTER 2

LITERATURE REVIEW

2.0 Introduction

In order to make this project successful, some studies and research have been discussed to find the appropriate information about the development of this android application for e-learning purpose and the evolution of e-learning from when it is first started until now and what are the mechanism of action for this android application and how to relate this e-learning android application and the other e- learning android application that are available in the market nowadays. Therefore, the appropriate interfaces for this application must be used to ensure the source of attraction for the children as this e- learning android application is basically designed for children education platform. Next, the evolution of android will also be discussed. Some studies have been done based on the components that are related to this project. Information that found are basically from some sources such as journals, articles and the internet. Lastly, the information that are gained from this study is used as the reference and guidance in order to achieve the target of completing this project within the specified time and also to have smooth working process of development oh this project.

2.1 Development

2.1.1 The Evolution of E-Learning: from Baby Steps to Giant Leaps

E-Learning is defined as the use of the Internet and other digital technologies to educate people without environmental limitations. The definition as through the term e-Learning was first used in the year 1999 when the word was first utilized at a

Cognitive Behavioral Therapy (CBT) seminar. This is also one of the reason why nowadays e-Learning is still considered as a new form of learning even for now in 2019.

E-Learning has progressed in different ways in the education, business and training sectors, and it has different explanations for different divisions. At school level, e-Learning refers to a learning process that uses both software-based and online learning tools, meanwhile in business sectors, preparation of trainers and higher education sectors, e-Learning exclusively refers to online learning. (Akansha Arora, 2016).

2.1.2 An E-Learning Timeline

Modern Times: 2011 Onwards (until now)

From 2011 onwards, online learning has progressive tools available that added to simplify e-Learning course creation. Today, e-Learning courses are popular among students, businesses and trainers. The implements used in the industry have become more easy to use. There is more content, expert advice, simulated classrooms, and a lot of communication.

Students use these technologies to gain knowledge in any one subject. Professionals use learning courses to improve their skill set and accomplish a better position in their career path. The future of e-Learning is bright and set to expand along with evolving technologies.