UNIVERSITI TEKNIKAL MALAYSIA MELAKA

DEVELOPMENT OF AN ELECTRONIC-BASED EDUCATIONAL BOARD GAME FOR TEACHING KINDERGARTEN KID ABOUT SPELLING OF BASIC ENGLISH WORDS USING ARDUINO AND BLUETOOTH (E-SPELLING)

This report is submitted in accordance with the requirement of the Universiti Teknikal Malaysia Melaka (UTeM) for the Award of Bachelor of Electronic Engineering Technology (Telecommunication) With Honours

by

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BORANG PENGESAHAN STATUS LAPORAN PROJEK SARJANA MUDA

Tajuk: **Development of an Electronic-Based Educational Board Game for Teaching Kindergarten Kid About Spelling of Basic English Words Using Arduino and Bluetooth (E-SPELLING)**

Sesi Pengajian: **2019/2020 Semester 2**

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This report is submitted to the Faculty of Electrical and Electronics Engineering Technology of Universiti Teknikal Malaysia Melaka (UTeM) as a partial fulfilment of the requirements for the degree of Bachelor of Electronic Engineering Technology (Telecommunication) With Honours. The member of the supervisory is as follow:

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Co-supervisor: AMAR FAIZ BIN ZAINAL ABIDIN

ABSTRAK

Matlamat projek ini adalah untuk membangunkan papan permainan pendidikan berasaskan elektronik untuk mengajar kanak-kanak tadika tentang ejaan perkataan Inggeris asas yang menjadikan pembelajaran lebih mudah, responsif dan menarik. Kami membangunkan papan permainan pendidikan berasaskan elektronik ini dengan mewujudkan sebuah aplikasi MIT dengan telefon pintar Android untuk mempaparkan gambar soalan dan menggunakan Arduino Mega sebagai otak yang menterjemahkan kod untuk komponen elektronik. Selain itu, kami juga menggunakan Bluetooth sebagai medium komunikasi untuk mengaitkan antara telefon pintar android dan mikropemproses Arduino. Proses pembelajaran ejaan perkataan asas bahasa Inggeris dengan menggunakan peranti ini berlaku apabila kanak-kanak tadika membuka aplikasi tersebut dan klik pada butang yang sudah diprogramkan untuk memaparkan soalan dalam bentuk imej. Selepas itu, kanak-kanak perlu meletakkan blok abjad pada alat peranti tersebut. Kemudian, Arduino akan memberi tindak balas terhadap blok abjad yang sudah diletakkan pada alat peranti yang telah dibina. Ia akan bertindak balas dengan mengahasilkan suara sekiranya kanak-kanak tadika telah mengeja dengan betul atau salah. Selain itu, kami juga menggunakan peraturan pembahagi voltan (VDR) ke dalam projek ini untuk mengesan dan membaca setiap blok abjad ini. Hasil projek ini dijangka melalui keberkesanan papan permainan pendidikan berasaskan elektronik Keberkesanan permainan papan pendidikan berasaskan elektronik ini akan diukur dengan melakukan kajian dan menguji produk ini dengan kanak-kanak tadika.

ABSTRACT

This project aims to develop an electronic-based educational board game for teaching kindergarten kid about spelling of basic English words that makes learning easy, responsive and attractive. We develop this electronic-based educational board game by creating an MIT app with Android smartphone to display question pictures and using Arduino Mega as the brain that translates the codes to electronic components. Besides, we also using Bluetooth as a communication medium to associate between an android smartphone and an Arduino microprocessor. This learning process of spelling of basic English words by using this device happens when the kindergarten kid enter the application and require to click the specific programmed button in the application to display the question in an image and the children required to place the alphabet blocks on its connection point depending to the image shown. Then Arduino embedded circuit will response when the alphabets block is correctly organized or properly sort it. It will respond by generating sound if the kindergarten kid spelling it correctly. Besides, we also applying voltage divider rule (VDR) into this project to detect and read each of the alphabet's blocks. The expected outcome of this project is the functionality of electronic-based educational board game. The effectiveness of the electronic-based educational board game is measured by doing a survey and test the product with the kindergarten kid.

DEDICATION

Thank you to my beloved parents, Mohd Azlan Bin Daiman and Noraida Binti Ab Manaf, family, lectures and friends.

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V	-	Voltage
R	-	Resistance
%	-	Percentage
Ω	-	Ohm

LIST OF ABBREVIATIONS

DC	-	Direct Current
LCD	-	Liquid Crystal Display
LED	-	Light Emitting Diode
PCB	-	Programmable Logic Controller
VDR	-	Voltage Divider Rule

CHAPTER 1

INTRODUCTION

1.1 Introduction

The objective of this chapter is to create the framework and introduce the project's brief idea. It focused on the project description, outlining the objectives, briefly explaining the problem, scope, and presenting the project outcome. The structure of the entire project can therefore be visualized accurately.

1.2 Background Study

In Malaysia a percentage of young children in pre-school that masters in learning English are not satisfactory which can be refer in research paper of Norlida Ahmad et al. (2004). This is because the children have less interest in learning English in in early age of preschool. Learning English in Malaysia for preschool children is so important because they will use as second language in primary, high school, universities and work in the future which made them understand English better. Therefore, we need to persuade them to learn basic English starting their childhood age in preschool education.

There is various way to make children easy to learn English. The interactive learning method for children is through game as they love to play. One of the ways to attract children interest is by using a game Basically, a game's concept is an activity