UNIVERSITI TEKNIKAL MALAYSIA MELAKA

DEVELOPMENT OF LEARN-IN-A-BOX ELECTRONIC-BASED EDUCATIONAL KIT FOR SIGNAL BLOCK DIAGRAM DESIGN CONCEPT USING ARDUINO AND MIT APPS

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

by

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DECLARATION

I hereby, declared this report entitled DEVELOPMENT OF LEARN-IN-A-BOX ELECTRONIC-BASED EDUCATIONAL KIT FOR SIGNAL BLOCK DIAGRAM DESIGN CONCEPT USING ARDUINO AND MIT APPS is the results of my own research except as cited in references.

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ABSTRAK

Teknologi Pendidikan telah menarik perhatian industri kerana memainkan peranan yang penting untuk pengajar dan pelajar pada teknologi masa kini. Pada masa yang sama, Gambarajah Isyarat Blok ialah salah satu subjek Pemprosesan Isyarat Digital yang merupakan salah satu teknologi pendidikan yang telah diajar di kolej dan sekolah.

Walaubagaimanapun, Gambarajah Blok Isyarat sukar difahami dan memerlukan banyak praktis untuk melihat perkembangan terhadap subjek tersebut. Salah satu cara mengatasi masalah tersebut ialah dengan menggunakan perisian Matlab yang boleh menukar isyarat blok kepada persamaan Z-transform, tetapi perisian Matlab tidak boleh menukarkannya semula kepada isyarat blok. Ini menyebabkan pelajar perlu mencari jalan dengan lebih mendalam bagi soalan yang susah. Selain itu, perisian Matlab memerlukan komputer untuk digunakan. Di sekolah bilangan komputer adalah terhad. Oleh yang demikian, pelajar perlu berkongsi komputer untuk belajar.

Bagi meningkatkan pengetahuan tentang Gambarajah Blok Isyarat, kit Learn-In-A-Box direka. Ini adalah untuk menambah pengetahuan pendidik dan pelajar bagi menganalisis and mengetahui lebih lanjut tentang subjek ini. Kit mudah alih ini dibentuk dan sebanyak 50 responden akan dinilai untuk memahami lebih lanjut tentang Pemprosesan Isyarat Digital.

ABSTRACT

Educational technology has captivated all the industry's attention because it plays the main role for student and teacher so it can be in line with nowadays technologies. At the same time, Digital Signal Processing is the one of the educational technologies that learn by the student in colleges and schools. One of the DSP subject are Signal Block Diagram.

Be that as it may, Signal Block Diagram are hard to comprehend. It needs more practices to see the progressively towards the subject. One way to solve are, there is a software called Matlab that can help to simulate the block diagram to form an equation of the Z-transform, yet it not be able to change the equation to form back a block diagram. As for the hard equation, student need to discover more. It needs the hands-on experiences so that student can be envision. Likewise, Matlab need a PC to run the simulink result. In school there have a restricted unit of computer. Along these cases, student need to share the computer to explore and to get more knowledge about the Signal Block Diagram subject.

In order to increase the knowledge about the Signal Block Diagram, the Portable Learn-In-A-Box was developed. It is to make the open stage for the educators and student use to analyze and find out more about the subject. The Portable kit are developed, and 50 respondents evaluate in order to understand more about the subject of DSP.

DEDICATION

It is my genuine thankful and mildness regard that I dedicated this work to my beloved parent, my brother and sister, my respectful supervisor and co supervisor, my precious lecturers and my friends.

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LIST OF SYMBOLS

g	-	Gram
%	-	Percentage
Ω	-	Ohm
cm	-	Centimetre
A	-	Ampere
V	-	Voltage
Hz	-	Hertz
KB	-	Kilo Byte
R	-	Resistance
3D	-	Three Dimension

LIST OF ABBREVIATIONS

DSP	-	Digital Signal Processing
Apps	-	Application
FYP	-	Final Year Project
IoT	-	Internet-of-Thing
UTeM	-	Universiti Teknikal Malaysia Melaka
PC	-	Personal Computer
LED	-	Light Emitting Diode
IT	-	Information Technology
DC	-	Direct Current
AC	-	Alternating Current
PCB	-	Printed Circuit Board
MIT	-	Massachusetts Institute of Technology