



**UNIVERSITI TEKNIKAL MALAYSIA MELAKA**

**QUIZU BOARD: DEVELOPMENT OF EDUCATIONAL  
BOARD THAT TEST STUDENT KNOWLEDGE ON  
SIGNAL BLOCK DIAGRAM**

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

by

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## APPROVAL

This report is submitted to the Faculty of Electrical and Electronic 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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## ABSTRAK

Tercetusnya kotak pembelajaran (Quizu Board) adalah untuk menguji pemahaman pelajar mengenai gambarajah signal yang berkaitan dengan subjek Pemprosesan Isyarat Digital. Pemprosesan Isyarat Digital (DSP) adalah salah satu topik komunikasi elektronik. Matlamat Quizu ini adalah untuk mereka bentuk dan membina teknik pembelajaran yang menguji pengetahuan pelajar mengenai konsep gambarajah signal yang menguji pelajar untuk menukar persamaan kepada gambarajah blok signal. Quizu ini telah dihasilkan dengan menggunakan Arduino Mega sebagai komponen utama kerana penghasilan Quizu ini mengandungi banyak input untuk dikendalikan. Penghasilan Quizu juga akan disambungkan ke Aplikasi MIT yang menggunakan bluetooth yang menjadikan pembelajaran menjadi lebih menarik dan menyeronokkan. Keberkesanan Quizu diuji dengan melakukan ujian kepada pelajar fakulti FTKEE (Fakulti Teknologi Kejuruteraan Elektrik Elektronik). Matlamat projek juga adalah untuk mewujudkan sesuatu yang lebih menarik, bijak dan menyeronokkan untuk belajar DSP.

## **ABSTRACT**

Development of the educational board (Quizu Board) is to measure student understanding on Signal Block Diagram that relate to the subject Digital Signal Processing. Digital Signal Processing (DSP) is one of the electronic communication subject. This Quizu Board aim is to design and built an educational board which tests student knowledge on concept of signal block diagram which is how the student convert an equation to the block diagram. This board's architecture is using Arduino Mega as a main component because this Quizu Board contains a lot of input to handle. The Quizu Board also will connected to the MIT App Inventor using bluetooth which make the learning become more attractive and fun. The Quizu Board effectiveness is measured by conducting a survey towards student FTKEE (Faculty of Electric Electronic Engineering Technology). The project aim is also to create something that is more interesting, thoughtful and enjoyable to learn DSP.

## **DEDICATION**

This report is dedicated to my beloved parents who educated and supported me throughout the process of doing this project. I am also wanted to say thank you to my supervisor and my friends who have encouraged, guided and inspired me to complete this project.



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## **LIST OF ABBREVIATIONS**

<b>DSP</b>	Principal Component Analysis
<b>FYP</b>	Final Year Project
<b>LED</b>	Light Emitting Diode
<b>LCD</b>	Liquid Crystal Display
<b>LAN</b>	Local Area Network
<b>ICT</b>	Information and Communication Technology
<b>USB</b>	Universal Serial Bus
<b>GILE</b>	Game Based Intelligent Learning Environment

# CHAPTER 1

## INTRODUCTION

### 1.1 Introduction

This chapter purposes to create the framework and introduces the project's idea. It focused on the project overview, detailing the goals, briefly explaining the problem, scope, and providing the project result. Therefore, the structure of the overall project can be visualized accurately.

### 1.2 Background Study

Educational board is a teaching tool used to assist learning methods on users while in the class where it helps bridge the gap between theory and practical measurements among students. According to Aashari (1999), educational board is described as a teaching equipment that functions as an introduction to the student's in their learning session. The use of educational board in tertiary education is lower because most of the educational methods are depending on theory only. Games are a very effective way to attract attention and retain interest, and at the same time can be fun, educational and cognitive. Thus one of the new e-learning trends is the development of different approaches which complement with educational games to make the learning more interesting. These educational games can be seen as a means of determining multiple learning activities for one or more players with predictable outcomes, objectives,

constraints, payoff rules and consequences are precisely defined in school education, universities and professional training courses.

The design for Quizu Board is to evaluate student knowledge of Signal Block Diagram. Signal Block Diagram is a subtopic in DSP subject for an electronic communication bachelor student. This subtopic is include in topic introduction to DSP. Students will also learn in this Quizu Board about how to convert the signal equation to the signal block diagram. That's why the Quizu Board is being developed to test student understanding on the equation being converted.

Development of Quizu Board is used to measure student understanding of the DSP Block Diagram concept. The board was created to attract the interest of students in the basic block diagram for primary, secondary and a beginner as well. An android application which is MIT Inventor were used in this project. An equation will be displayed on the Android and student need to do a connection of the block diagram on the Quizu Board. So students can check whether their block diagram relate to the equation is correct or not. If the connection are true, the android will produce the correct sound and green LED will be turned on. If the answer is wrong, the android will produce wrong sound and the red LED will be turned on. This educational kit is a method for students to study the DSP block diagram process. If the first approach is fun and interesting, the student's interest in a subject will be easier. It will make it easy for the student to understand how to learn it. Furthermore, the practical application of the knowledge obtained from the textbooks makes the learning process much more fun.