

**THE DEVELOPMENT OF INSTRUCTIONAL LEARNING OBJECTS FOR
TEACHING OPERATING SYSTEM TO TERTIARY STUDENTS USING
IBOOK**

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UNIVERSITI TEKNIKAL MALAYSIA MELAKA

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IBOOK**

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This report is submitted in partial fulfilment of the requirements for the
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FACULTY OF INFORMATION AND COMMUNICATION TECHNOLOGY
UNIVERSITI TEKNIKAL MALAYSIA MELAKA
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DECLARATION

I hereby declare that this project report entitled
**THE DEVELOPMENT OF INSTRUCTIONAL LEARNING OBJECTS
FOR TEACHING OPERATING SYSTEM TO TERTIARY STUDENTS
USING IBOOK**

is written by me with my own effort and no part has been plagiarized without
citations.

STUDENT : _____ Date : _____
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SUPERVISOR : _____ Date : _____
(Dr. MOHD HAFIZ BIN ZAKARIA)

DEDICATION

I dedicate my dissertation work to the person I loved the most especially to my family and to the rest of lovely friends. A very special feeling of my sincere gratitude to my mother, father, friends and also to Dr MOHD HAFIZ BIN ZAKARIA on endless advice, encouragement and motivation that never ends. Your support and guidance were never being forgotten.

ACKNOWLEDGEMENT

A thousands thanks to Allah S.W.T for his blessing, development of learning object for Operating System subject (chapter 4 Concurrency: Mutual Exclusion and synchronization and chapter 5 Concurrency: Deadlock and Starvation) was finally done and finished. Throughout all the process, many failure and mistake were made, but eventually at the end, due with all the efforts and love that have been put into this project, the product were finally done in time and satisfy all the requirements needed.

Many thanks to Dr Hafiz Bin Zakaria upon his endless guidance and help from the starting point until the end of the project. Not to forget also towards my lovely family, Mom and Dad, for their love and moral support. Thank you also to Mohd Ashraffi Anderson for always be there for me as this person always get along through thick and thin with me and also to my lovely and super-motivated friends for their non-stop care and guide from the starting day until now. Thank you everybody.

ABSTRACT

This project is about developing learning object for Operating System subject (chapter 4 Concurrency: Mutual Exclusion and synchronization and chapter 5 Concurrency: Deadlock and Starvation). 10 learning object that need to be developed such as an animation, audio, video, simple games and text. But, there was more than 10 learning object being developed. Besides developing the learning object, several widgets being used to help developing the content in iBook. After done developing learning object, it will be included in the iBook (interactive book). This project will be presented to the user using the iPad from Apple. Learning object is a new concept in educational technology. As for this project, an interactive learning object will be develop to make students more attract and can understand well about the topic that will be cover. It is very difficult for some students to understand what they read through the textbook. With some interactive method, it can help them understand easier. The objective of this project is to investigate which methodology is appropriate for developing learning object for IBook, to analyses type of learning object that able to attract student's attention and how far students can understand and give commitment to learn through learning object instead of printed note or lecture and to develop learning object this gives positive impacts on student's attention towards learning process. ADDIE model is the methodology that being used for developing this project. There will be two user involved in this project for testing phase. The major target group is for students of the Technical University of Malaysia Malacca who enrolled subjects Operating System (BITS 1213). Second is for lecturer that teaching this subject. Experiment group that consist of students who enrolled subjects Operating System (BITS 1213) were given a note in the form of PowerPoint, and then they are asked to complete a pre-test questions. The results of the pre-test questions are less than the post-test questions after they were given an iPad that contains the product. Hence, it will guide and help them to easily understand the subject that they learn

ABSTRAK

Projek ini adalah tentang membina serta mereka cipta Objek Pembelajaran bagi subjek Operating System (Chapter 4: Concurrency: Mutual Exclusion and synchronization and chapter 5 Concurrency: Deadlock and Starvation). 10 Objek Pembelajaran yang diperlukan untuk dibangunkan antaranya seperti animasi, audio, video, permainan serta tulisan. Objek Pembelajaran yang dicipta. Selain membangunkan Objek Pembelajaran, beberapa widget digunakan untuk dalam membantu proses membangunkan isi kandungan di dalam iBook. Setelah selesai dengan proses pembangunan, ianya akan di masukkan di dalam iBook .Projek ini seterusnya akan dipaparkan kepada pengguna menggunakan iPad. Objek Pembelajaran bertujuan untuk menambahkan minat ke dalam diri pelajar, dan juga menambahkan lagi pemahaman terhadap satu subjek tersebut dengan lebih mendalam. Objektif projek ini adalah untuk mengkaji metodologi yang sesuai untuk Objek Pembelajaran bagi tujuan dimasukkan ke dalam iBook. Selain itu, objektif projek ini juga adalah untuk menganalisa jenis Objek Pembelajaran yang mana dapat menarik lebih minat pelajar dan sejauh mana pemahaman serta komitmen mereka untuk mempelajari sesuatu subjek tersebut. Metodologi ADDIE telah digunapakai dalam projek ini. Ia akan melibatkan dua pengguna dicalonkan untuk menjalankan fasa percubaan projek kelak. Kumpulan untuk ujian percubaan bagi projek ini adalah tergolong daripada pelajar Universiti Teknikal Malaysia Melaka (UTeM) yang mengambil subjek Operating System (BITS 1213). Kemudian, kepada para pensyarah yang mengajar subjek ini. Kumpulan eksperimen yang terdiri daripada pelajar yang mengambil subjek Operating System (BITS 1213) telah diuji sebelum dan selepas mereka mengujikaji produk. Mereka diberikan nota dalam bentuk PowerPoint, dan kemudian mereka di minta untuk melengkapkan soalan pra-ujian. Hasil soalan pra-ujian adalah kurang berbanding dengan soalan pasca ujian selepas mereka diberi iPad yang mengandungi produk. Maka dengan itu, dengan wujudnya Objek Pembelajaran ini, para pelajar akan dapat lebih fokus dan memahami subjek.

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LIST OF ABBREVIATION

ABBREVIATION	DESCRIPTION
2D	2 Dimensions
3D	3 Dimensions

CHAPTER I

INTRODUCTION

1.0 Project Background

Nowadays, students are relying on technology to gain knowledge. Beside attend to college; they are more likely to learn from the online resource. Laptop, tablets and smart phones are part of their life because they rather to communicate with each other are through social network. They also do their assignment by using laptop or desktop. Nowadays it is a new era where students do not really tend to go to the library to get any information they want, especially about their studies. Now is the new era where we can get information at your fingertips.

Under supervision of Dr. Mohd Hafiz Bin Zakaria, companionable with the development of technology for the time being, the projects that will be developed are learning objects for Operating System subject. Operating system subject is an essential subject that needs to be registered by student enrolling Operating System in Computer Science course. Operating system has been chosen because there are some difficult topics for students to understand. The topics have been chosen is chapter 4

Concurrency: Mutual Exclusion and Synchronization and chapter 5 Concurrency: Deadlock and Starvation. This two topics will be developed in the form of learning objects to facilitate students for understand the concept that want to be deliver. After done developing learning object, it will be included in the iBook (interactive book). This project will be presented to the user using the iPad from Apple.

Learning object is a new concept in educational technology. Learning objects, as specified by the Committee on Standards in Technology Education in the IEEE's (<http://ltsc.ieee.org>), is "any entity, digital or non-digital, which can be used, reused or referenced during technology supported learning ". There is many example to do learning object. Such as animation, video campaign, cognitive tools and much more.

As for this project, an interactive learning object will be develop to make students more attract and can understand well about the topic that will be cover. The outline for topic Concurrency: Mutual Exclusion and Synchronization is students will be introduced to the Concept of Concurrency, What cause of concurrency, Multiple process, Difficulties of Concurrency, Operating system concerns related to concurrency, Process Interaction, Requirement for mutual exclusion, and Type of solution. For the next topic that is Concurrency: Deadlock and Starvation, students will be introduced to the about Concurrency: Deadlock and Starvation, students will be introduced to the Concept of Deadlock, Resources Categories, Condition for deadlock, Method for handling deadlock, Strategies once deadlock detected and Dining philosophy problem.

This project will be developing to create a new learning environment. Beside learn through PowerPoint or notes, students will be able to watch an interactive learning object in their own iPad or iPhone. This iBook will covey the information to students in interactive way. Students can absorb information, increasing their attention, and commitment of this particular subject. Each chapter will develop in interactive way.

1.1 Problem Statements

The difficulty is that there are a number of students who learn slowly. Nowadays, students are relying on technology to gain knowledge. Some of them cannot understand the subjects described by the lecturer in the classroom. If students read the book, they are easily bored and sleepy when they see a lot of writing in textbooks. There are also students who could not understand what they read, even if they try to read it quite a few times.

A few of the textbooks contain images in it to sustain the explanation, however mostly they make use of black and white. It is not interactive at all and excessively plain. Therefore, the explanation for this situation in the form of learning objects might be helpful. For lecturers, it is hard for them to catch the attention of the students to be more participate in class. To be sure, there will be students who are sleeping in class, playing with their cell phones, chatting with friends while lecturers teach in front of the class and some of them do not focus as to think of other things.

Chapters 4(Concurrency: Mutual Exclusion and Synchronization) and chapter 5 (Concurrency: Deadlock and Starvation) were selected for the development of learning objects is because based on the observation that shows the results of last semester that many students fail to subject's operating system. Based on information from the lecturers who teach the subject, they said topics 4 and 5 are two of the most difficult topics for students to grasp. Thus, the development of the object to topics 4 and 5 learning will be developed.

The appearance of learning object, students will have more precise focus in order to fully understand the message delivered. Hence, it will guide and help them to easily understand the subject that they learned. ADDIE model is selected to be use throughout the development process. Optimistically, with development of this project, students are able to understand chapters 4 and 5 easily because of the interactive learning object and exercise that provide that can help students to better sharpen their understanding of this chapter.

1.2 Objectives

1. To investigate what learning approach is appropriate for developing learning object for IBook.
2. To analyse which of learning object can attract student's attention and how far students can understand and give commitment to learn through learning object instead of printed note or lecture.
3. To develop learning object this gives positive impacts on student's attention towards learning process.

1.3 Scopes

The project scope focused on two areas, to be precise the user and specified learning object. Each area specified in section 1.4.1 and 1.4.2 for specific users and specified learning object

1.3.1 Specified User

The major target group is for students of the Technical University of Malaysia Malacca who enrolled subjects Operating System (BITS 1213). The learning object will be included in the iBook. The iBook is literally similar to a textbook, but they are more interesting and easy for any students to understand about topic that will be covered. This learning object were created by developer and after done develop; it will be included in the iBook. Second is lecturer that teaching this subject.

1.3.2 Specified Learning Object

Table 1.0 Specified learning object

No	Learning Object	Description
1	Video	Enable users to watch videos that included in the iBook. Video is record and edited by the developer.
2	Animation	Enable users to watch the animation in the form of process-related in real life activities. Animation was developed by the developer.
3	Interactive Image	Enable users to see and touch the images, when touch the image description will pop up to show the detail of image.
4	Crossword puzzles	Users can play with the game