***i* SCIENCE YEAR ONE PRIMARY SCHOOL**

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DEDICATION

I dedicate this thesis project to my parents, Sir Che Lah Bin Mahmud and Madam Hamisah Binti Idris, who taught me that the best kind of knowledge to have is that which is learned for its own sake. It is also dedicated to my family especially my siblings that gives me an idea about choosing the title of this project. Lastly, to all my lecturer and friends that always give me the excellence idea and helping me in finishing this final year project.

ACKNOWLEDGEMENTS

Bismillahirrahmanirrahim

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Not forgotten, thank you very much for people that contribute and helping me in completing my project. Thank you to all of you.

ABSTRACT

iBook of topic Dunia Sains Dan Teknologi is an electronic book that supports various type of interactivity which will be a tool to help on the process of learning the subject for primary schools students. It contains four main multimedia elements which are images, text, animation and audios to help ease of users to understand the step-by-step of the process. The interface of the iBook is very simple and it allows its users to interact with the interface to help engaging students to learn the subject.

The multimedia elements in the iBook are created using open source software's available on the internet. The images are designed using Adobe illustrator and Adobe Photoshop while the animation are created using Adobe Flash.

Adobe Captivate,one of most popular eLearning tool. Adobe system brought the rights and changes its name to Captivate. Adobe Captivate uses objects to create interactivities. By using this tool, the developer can create responsive eLearning courses that can be accessed on all handheld devices. Three units in Dunia Sains Dan Teknologi which has been considered as basic topic have been chosen as subject's matters in order to develop the iBook.

ABSTRAK

iBook topik Dunia Sains Dan Teknologi adalah sebuah buku elektronik yang menyokong pelbagai jenis interaktiviti yang akan menjadi alat untuk membantu dalam proses pembelajaran subjek untuk pelajar-pelajar sekolah rendah. Ia mengandungi empat elemen multimedia utama iaitu imej, teks , animasi dan audio untuk membantu memudahkan pengguna memahami langkah demi langkah proses itu. Rekabentuk iBook adalah sangat mudah dan ia membolehkan pengguna untuk berinteraksi dengan rekabentuk iBook untuk membantu pelajar belajar dengan subjek ini.

Elemen-elemen multimedia dalam iBook dicipta menggunakan perisian sumber terbuka yang boleh didapati di internet . Imej-imej yang direka menggunakan Adobe ilustrator dan Adobe Photoshop manakala animasi adalah dicipta menggunakan Adobe Flash.

Adobe Captivate , salah satu alat eLearning paling popular. Adobe Captivate menggunakan objek untuk mencipta interaktiviti . Dengan menggunakan alat ini , pemaju boleh mewujudkan kursus-kursus eLearning responsif yang boleh diakses pada semua peranti pegang tangan. Tiga unit dalam Dunia Sains Dan Teknologi yang telah dianggap sebagai topik asas telah dipilih sebagai perkara-perkara yang tertakluk dalam usaha untuk membangunkan iBook .

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CHAPTER I

INTRODUCTION

1.1 Project Background

Since early in the century, textbooks became crucial teaching instruments in schools, when education became compulsory. Textbooks are basically tools of instruction in any branch of study, and are usually created in several at different level. Different level textbooks may either contain different information, or different level explanations.

There are many ways and tools of making the students get interesting of learning in the classroom. iBooks is a brilliant apps for buying, organising and accessing books and with more publishers getting involved the choice of iBooks is increasing every day. For teachers this choice can make finding great books a chore, meaning we are sticking to books we already have copies of in the classroom or we are missing some of the advantages of having electronic copies. iBooks is not only a fantastic e-reading app on iPhone or iPad, but it's also a fantastic study tool. If students need to read books for class or own learning objectives, they can use iBooks to highlight words or passages, search the text for specific words or phrases, and make notes that appear in the margins as little colored sticky notes.Using these tools could help students become a much more organized studier, letting go back to a passage in a book to remember the important things with a couple of taps.

1.2 Problem Statement

The problem statements of using textbooks is student have to learn based on the notes given and this is one of the factors why the primary school students can't motivate themselves.

The second problem statement is student may lack the vocabulary and languages skills to read and understand the textbooks. They must spend a lot of money to buy the dictionaries and languages books on the bookshops.

The last problem statement is student lose attention due to boring teacher presentation. It tells that students don't have any experience of learning if they just sit on the classroom without doing any activities.

1.3 Objectives

This project embarks on the following objectives:

- To investigate the factors on how to motivate students learning by using iBooks.
- To develop iBooks Science learning for primary school students
- To evaluate the primary students experience with iBooks

1.4 Project Scopes

This iBook project scope covers the learning Science about Benda Hidup dan Benda Bukan Hidup, Manusia , Haiwan. This project focuses on handheld devices.

This project is primarily designed for primary school student Year 1. This is because the chance for them to learn something new using electronic medium will be more fun and enjoy.

1.5 Project Significances

This iBooks is suitable for the primary school student Year 1 who has the interest to learn using electronic media. It is designed to optimize the satisfaction of students and delivered the simple and interactive information. This is aims to let them to understand the content of the topic easily by using iBook compare to the textbook.

With this iBooks, students do not have to bring much more text book. They can use this iBook's directly using their school devices tools. In addition, they can save energy and parents money to buy a lot of books.

Besides, by developing iBooks, teachers and parents will obtain the benefits respectively. For the teachers who responsible to teach the students in class, they not need to worry about the concentration of students because iBooks will give the students more attention and fun in learning. Parent also can save their money and time to buy their children with a lot of books.

1.6 Expected Results/Benefit

The expected result of this project is:

- An iBook design element to motivate primary students
- iBook for learning science as a new tools for primary school students
- Overview of students experience on using iBook.

1.7 Conclusion

In a nutshell, this project aims to develop an iBook which names iBook For Science Year One Primary School students. This iBook will facilitate students and be much useful for them as they can read the topic and syllabus of Dunia Science dan Teknologi Year One through using handheld devices at anywhere and anytime. Besides that, this can increase their interest on learning due to this iBook. Therefore, this is a convenience media learning and help students to solve the problem faced when they learn in the class.

For the next chapter, the activities will be developed is literature review and project methodology. The literature review will discuss the technology and technique that being applied in schools. While the project methodology is identified the method that used to develop this project and discussed the method used. Project schedule and milestones of this project will provide and explain in the next chapter in order to ensure the progress of this project is step by step and in time that planned.

CHAPTER II

LITERATURE REVIEW AND PROJECT METHODOLOGY

2.1 Introduction

In this chapter, a literature review and project methodology for developing this iBook would be discussed. Literature review plays an important role in developing this project. It is about gathering, analysing and conducting the reading about the related topics of the project that implemented. For this project, most of the reading sources for the literature review are from the reference books, articles, journal, and Internet. The literature review will be done by searching articles about previous study used in primary schools, reference book about Science in library, and information about iBook that is going to implement in my project through the internet.

The methodology for this project is also explained in this chapter. The methodology for this project is also explained in this chapter. The methodology is the method chosen to be as a guide when develop this iBook project. The ADDIE model is applied during the completion of the project. The ADDIE model is approach to meet the specification of learning application development.

Besides that, the project requirement for this iBook project such as software and hardware requirement are defined in this chapter and also described the project schedule and milestones.

2.2 Domain

The main part of this project is the student learning motivation of the subject using iBook. Teachers must teach all the learning styles in classroom with another ways to motivate the students learning. It is unrealistic to expect an auditory learner to be successful and motivated if her sole instruction comes from reading a textbook. The related and relevant information and the project requirement is gathered according to the syllabus this project will be developed based on the appropriate and verified documents and requirements. In the next sections the terms that are used in this project are discussed.

2.3 Existing System

There are few methods and approaches that have been used in learning the subject of Science Year One. Currently, primary students even those who are learn most of their subject based on lecture notes and book given by the teachers. The content of text-based notes is verified by Kementerian Pelajaran Malaysia. One of the text-based notes is developed by the well-known company, Dewan Bahasa Dan Pustaka.

2.3.1 Comparison of Existing System

Table 2.1: Comparison Table of System

System/Apps	Description	Pro And Cons
Text Based Notes (Dunia Sains dan Teknologi Tahun 1, Buku Teks Kementerian Pelajaran Malaysia)	This approach is the normal approach usually used by teachers to teach students. It required printed notes from the teachers or a book that relates with the subjects.	• Easily carried anywhere. • Require the use of paper • No interaction between the user and the paper.
iBook of Science	This is the electronic version of book unlike any other	• Easily carried anywhere

	eBook. This iBook have the interactive elements which allow users to engage with the content of the iBook itself.	• Provide users with interactive elements.
Web-Based Application (http://www.e-learningforkids.org/science/)	The Web-Based application for learning provides a platform for its user which combines element of ICT. Student can learn and do the exercise in interactive content. It is application that makes student fun and enjoys learning with it.	• Students gets more material in one website with one click • Can easy to communicate with teachers. • Students need the WI-FI or connection of internet to learn Science and this make it limited to learn with it.
Learning Science using CD (Rock n Learn Science DVDs)	This approached is similar but not fully with learn using web-based because this way also used interactive content for description but it is publish in CD ROM and it need to run on computer.	• Students can learn an interactive content and can play the games. • Students need the laptop or computer to run the CD to learn Science and this make it limited to bring and run it. • It not expensive like web-based application but difficult to find the CD learning the subject that we want.

2.4 Project Methodology

The methodology is the method chosen to be applied during the complication of the project. There are two types of methodology applied within this project which are project methodology and research methodology.

The project methodology that is used in developing this project is the ADDIE model where all of the five phases in this model will be applied throughout the development as a guideline to finish this project. ADDIE model is choosen in this project because it is suitable for learning content like iBook.It also provides a strategic planning for instructional activities.

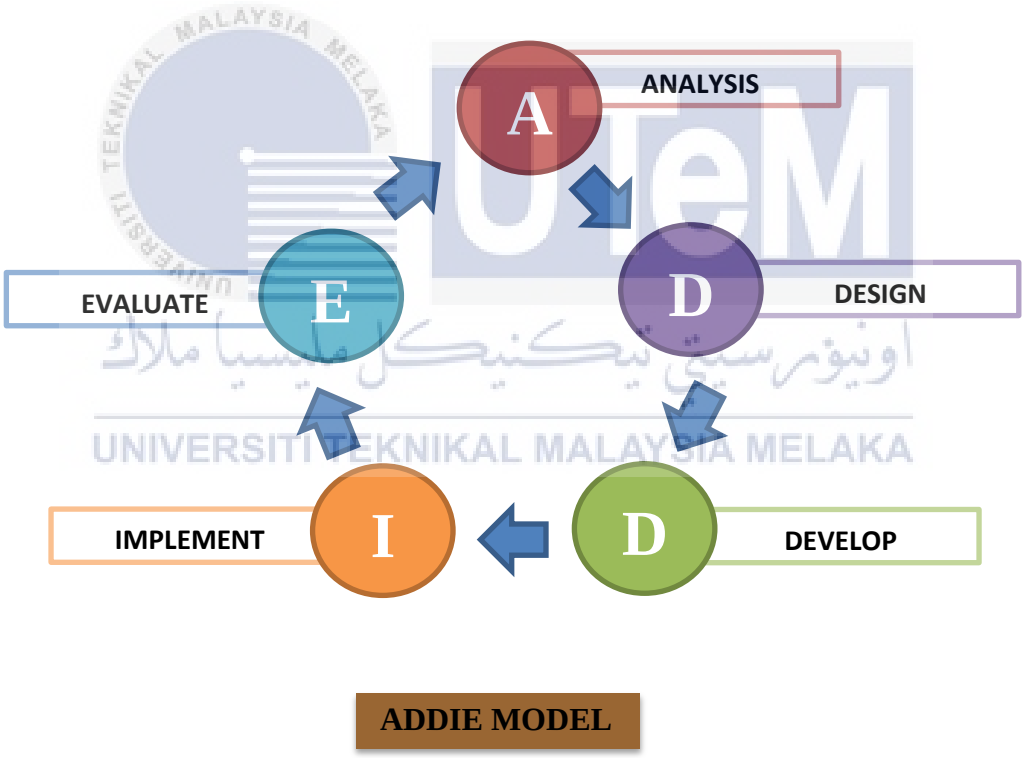


Figure 2.1: Phases in ADDIE Model

PHASE 1: Analysis

In this phase, we need to identify the learning problem, the goals and objectives, the students' needs existing knowledge, and any other relevant characteristics. Analysis also considers the learning environment, any constraints the delivery options, and the timeline for the project. Requirements will be discussed with project supervisor and redefined.

PHASE 2: Design

In this phase, the requirement specifications from the first phase are studied and the project design will be prepared. The rough interface design is needed and will be constructed and overall sketch of multimedia element will also be able to be seen. The project design specification serves as an input for the next phase of the model.

PHASE 3: Development

The development phase focuses on building the outcome of the design phase. Thus process consumes much of the time spent in developing iBook of course.

PHASE 4: Implementation

The project will be tested directly to the group of selected students to fulfil the last objective of this project.

PHASE 5: Evaluation

This phase consists of formative and summative evaluation. Formative evaluation is present in each stage of the ADDIE process .Summative evaluation consists of tests design for criterion –related referenced items and providing opportunities for feedback from the users.

2.4.1 Instructional Design

This section consist of the educational goals, course map/flowchart, detailed course content, test questions and the metaphor of this project.

- **Educational Goals**

  This section describes the learning content of the iBook. After completing the learning, student will be able to have fully understanding about the concepts. This includes the methods of solving the topics. The main goal in this project is to increase the user's understanding and the engagement between the user and the notes. By using this iBook, student will be able to easily understand the whole topic.

- **Course map/flowchart**

  These figure following show about the chapter that must focused in subject of Science, Subtopic and Multimedia element that covered are also shown in the section. In this project, there have examples and exercises to be illustrated and there have multimedia elements to be applied respectively.

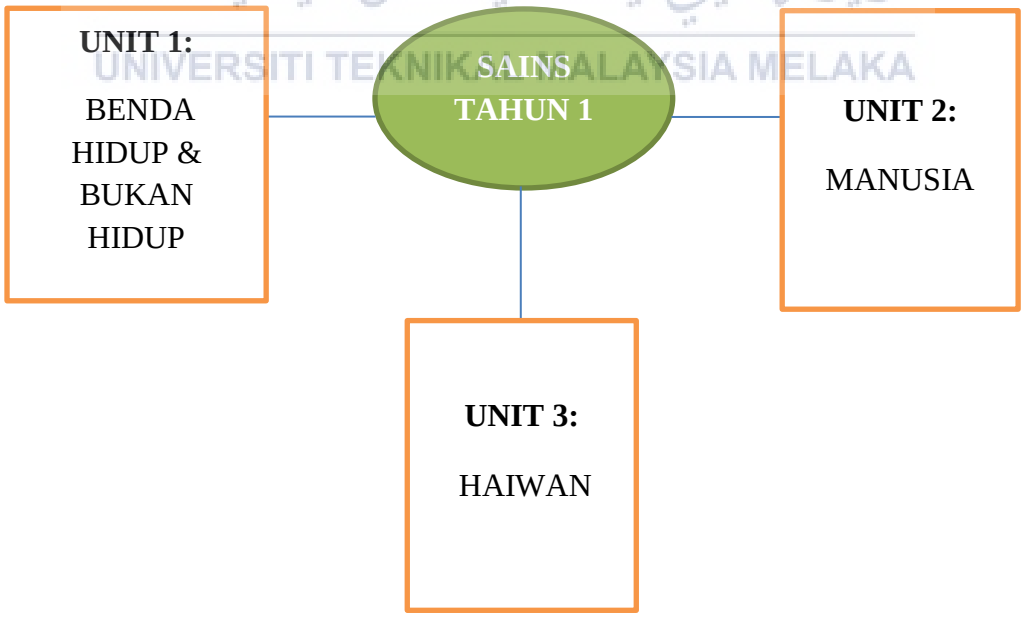


Figure 2.2: Topic of Dunia Sains & Teknologi Tahun 1 That Focused

- **Detailed Course Content**

Refer to Figure 2.3 and Figure 2.4 is the overall of course map that need have when develop this project. Below are the chunks of the general course map before.

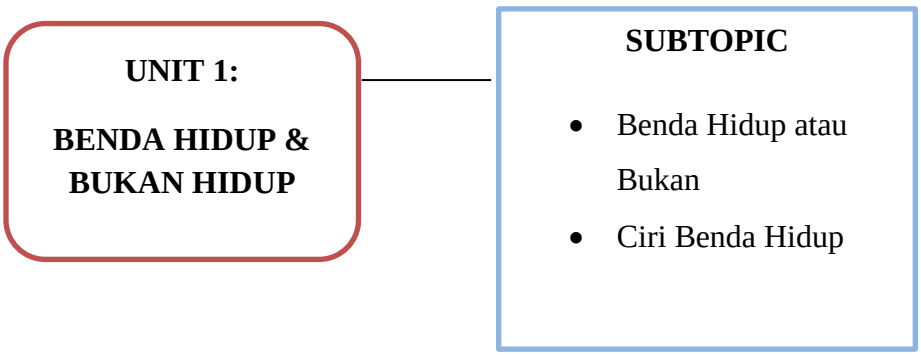


Figure 2.3: Subtopic of the Unit 1 That Was Focused

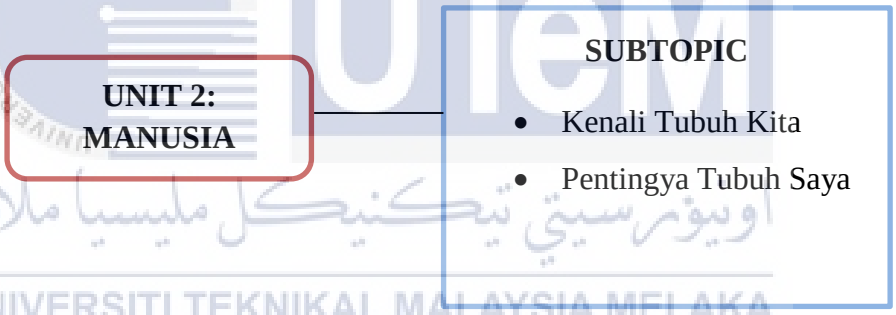


Figure 2.4: Subtopic of the Unit 2 That Was Focused

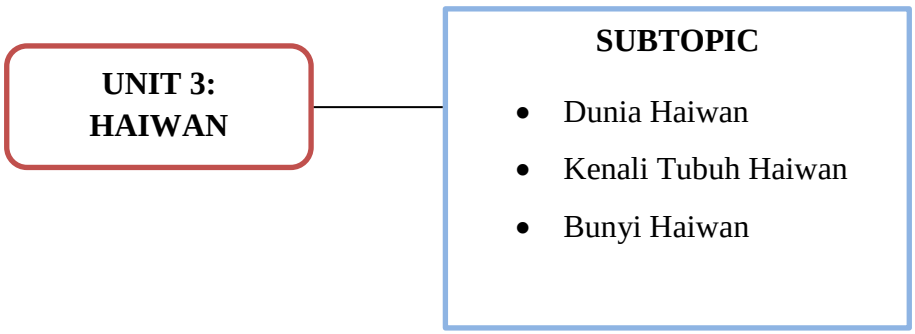


Figure 2.5: Subtopic of the Unit 3 That Was Focused

- **Test Question**

  In this project, developer did not focus more on the exercise or activities because developer focused more on how to deliver Science subject that is Dunia Sains dan Teknologi using new approach which is iBook. Therefore, for the exercise, teacher will create the test for students to test student what student learn based on notes given in iBook.

- **Metaphor**

  As usual, every application needs to have theme graphics that will more fun and look cheerful to capture user interests to buy the application. The theme that developers decided to use in this iBook project is the nature and inside house theme but in cartoon version of design and also the metaphor or approaches that are used in this project development are the unique designs that will capture user interest to explore more on the subject. There are several multimedia elements such as animation, audios and images to be insert in the iBook to increase the level of user interest on the subject. The following figure shows the project themes.

Figure 2.6: Image of Science Year 1 in front page before start notes.

2.5 Project Requirements

The project requirement covers on hardware and software requirement for this project.

2.5.1 Software Requirement

Software requirement is the minimum condition of the software capacity that is needed to develop this project.

Table 2.2: List of Software Requirement

SOFTWARE	DESCRIPTION
Adobe Captivate	Use to develop the iBook
Adobe Flash	Use to create video of learning
Adobe Photoshop cs5	Use to create the design any sources for this project
Adobe Illustrator cs5	Use to create the design any sources for this project
Adobe Audition	Use to edit audio and sound for this project

2.5.2 Hardware Requirement

Hardware also plays important for developing the end product. The minimum requirements of hardware for the end product are:

- Type of Device: Handheld device which support iBook
- User Interaction : Touch Screen

Other Requirement

Other requirement used for finishing this project. The requirements that have been used in this project are:

- **Laptop**
  - Model : ASUS A455L
  - Graphic : Intel inside core i5
  - HDD : 1TB
  - RAM : 4GB
  - Precessor : Intel ® Core™

- **Browser** (for searching information)
  - Mozilla Firefox
  - Google Chrome
  - Internet Explorer

- **Social Network** (for searching information)
  - You Tube

- **Removable Device**
  - Pendrive 8GB
  - External Drive 500GB

2.6 Conclusion

All of the reviews of the literature of existing systems are discussed and analysed in this chapter. The comparisons are made between these chosen systems to produce a new system of quality which in hope can overcome the deficiencies. The requirements of both hardware and software are also discussed in this chapter. The selection of appropriate hardware and software is made to build the project.

CHAPTER III

ANALYSIS

This chapter will explain more details about the current scenario and the requirement analysis. Analysis is a technique of studying the nature of something or of determining important features and their relations. It is also will help us to look over and decide whether something is good or bad and to describe something about what developer analyst.

This chapter also discuss the effectiveness of having interactivity between the user and the notes in order to capture user interest and increase their engagement with the subject. It will also tell about the system flow or navigation flow, system requirement analysis such as project analysis of learning content. During analysis phase, information that was composed from chapter one and two will be explained more details.

3.1 Current Scenario Analysis

The current scenario analysis contains the generic flow of existing system. The existing system that relates to this research is the text based notes. For now, the current system uses are lack of user interactivity and low engagement from the user.

The traditional way of reading and digesting the notes decrease user's desire to explore and have themselves to self-learning the subject. The printed notes do not have any interactivity between the content and the user. Thus, making the user to have least interest in the learning the subject. Not only that, the existing learning is also difficult to bring anywhere

students want. It is very difficult for them to bring a lot and heavy books to learn this subject when they are outside of schools.

In iBook, there is a lot of content that can give student more interesting to learn and easy to understand. Developer develop the iBook based on referred to the text book and create something new and interesting tools to apply in iBook system. There are four elements that developer applies in making the iBook look fun such as animation, text, graphic and audio.

3.2 Requirement analysis

3.2.1 Project Requirement

- **Learning Content**

  This section briefly describes the various analysis to develop the iBook including the requirement gathering.

  - **Need Analysis**

  The main reason of developing this iBook is because the students are lack interest in studying this subject. Therefore, this iBook is developed in order to encourage students to learn the subject and to increase the level of user interest in learning Science subject. The traditional way of learning which is by using normal notes does not have interactive and multimedia elements that can capture user interest on learning the subject not to mention to understand the subject.

  - **User Analysis**

  The students does not interest with this subject as the subject involves many complex notes and words. Moreover, the normal printed note is quite boring and does not have any interaction between the user and the system at all. Students are found out to have more attention to learn Science in a different way on the beautiful design and all of the multimedia elements that involves interactivity.

- **Technical Analysis**

The technical analysis involves the type of multimedia elements used including the images, audio, text and animation. In this project, developer creates that element to give easier way to student understand that topics was covered. Not only have that, developer also analysed the theme background colours that are applied for this system to give effectiveness to students to encourage them to study of refresh a note of Science in which where they are.

- **Resources Analysis**

For subject of Science Year 1 are have twelve units covered. But the content of the iBook chosen is only three units which is the basic unit. The three units was focused in this project are Benda Hidup Dan Benda Bukan Hidup, Manusia, Haiwan. This unit is randomly chosen by the developer based on the level of students. All of the content of this iBook are referred from the text books used by the primary schools and some of the information are based on the trusted source from the internet.

- **Requirement Gathering**

In this project, requirement gather using text book to identify the topic need to cover and give more attention to that topic because it is the basic topic for students to understand. Not only that, developer also referred to the text book to make an interactive ibook and create the interactive pages of the system or product. Science teacher and people in any ages for this system that which designs is suitable to use when they learn Science.

3.2.2 Software Requirement

Software requirement is the minimum condition of the software capacity that is needed to develop this project.

Table 3.1 : List of Sofware Requirement

SOFTWARE	DESCRIPTION
Adobe Captivate	Use to develop the iBook
Adobe Flash	Use to create video of learning
Adobe Photoshop cs5	Use to create the design any sources for this project
Adobe Illustrator cs5	Use to create the design any sources for this project
Adobe Audition	Use to edit audio and sound for this project

3.2.3 Hardware Requirement

- **Laptop**
  - Model : ASUS A455L
  - Graphic : Intel inside core i5
  - HDD : 1TB
  - RAM : 4GB
  - Processor : Intel ® Core™

- Type of devices : Handheld device that support iBook
- User Interaction : Touch Screen

3.3 Project Schedule and Milestone

There are specific schedule and milestone that have to be followed during implementation of Project Sarjana Muda (PSM). The project schedule are divided into several section based on the activities need to be completed. This project schedule is to ensure the task and activities are done by the specified time. The project schedule and milestone are attached in Appendix B.

List of stage and activities.

The project milestones are described based on the methodology used and the days needed to completed project is estimated.

Table 3.2: Project Milestone

No.	Milestone	Duration
1	Confirmation of Supervisor and Project Title	2 days
2	Submission of Project Proposal	2 days
3	Information Gathering and Research for Chapter 1	5 days
4	Submit Chapter 1- Introduction	1 day
5	Explore Adobe Captivate and make research for Chapter 2	7 days
6	Submit Chapter 2 – Literature Review	1 day
7	Review and Complete Project Methodology	5 days
8	Modification of Chapter 1 & 2 and submission of Chapter 1 & 2	3 days
9	Analyzation of Project Requirement and Information Gathering for Chapter 3	3 days
10	Create the plan for iBook development – Sketch the interface	7 days
11	Submit the interface	1 days
12	Get approval of interface and submission of Chapter 3	1 day
13	Screen Design – The iBook Cover Page, table of content	5 days
14	Improvement on the Sketch of the interface to be put in Chapter 4	3 days
15	Screen Design – The Content of iBook	7 days

16	Project Evaluation Part 1	1 day
17	Design 2D image to be put in the iBook	14 days
18	Submission of Chapter 4	1 day
19	Project Implementation Analysis	3 days
20	Completion & Submission of Full Report (Draft)	7 days
21	Presentation of PSM 1	1 day
22	Submit Chapter 4&5 – Design and Implementation	5 days
23	Presentation of Movement 1 for Chapter 5	5 days
24	Submit Chapter 5&6 – Implmentation and Testing	5 days
25	Presentation of Movement 2 for Chapter 6	5 days
26	Submit Chapter 6&7 – Testing & Conclusion	5 days
27	Submit Correction of Chapter 6 & 7 and full draft of report PSM	5 days
28	Last Presentation of PSM	2 days
29	Do the correction draft of report PSM and get the marks	5 days
30	Submission of full report of PSM	4 days

3.4 Conclusion

As a conclusion, the analysis part defines all of the process in analyse the existing system in order to produce a better proposed system.

CHAPTER IV

DESIGN

4.1 Introduction

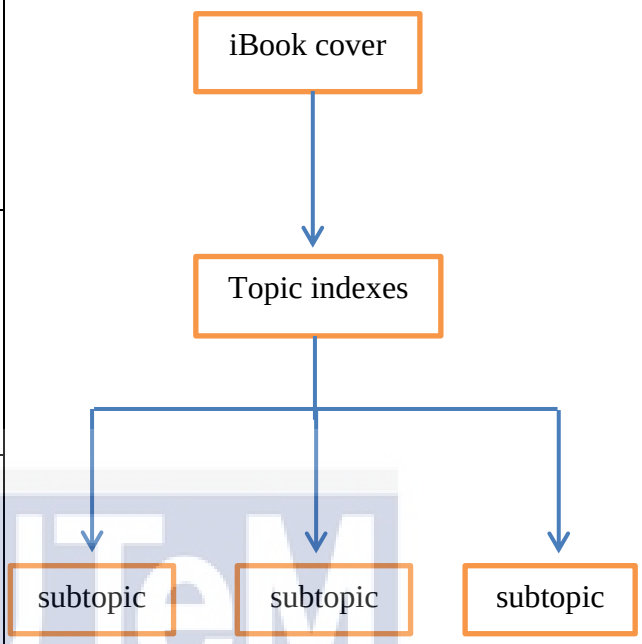
This is the fourth phase of the development phase and the designs of the interfaces of the iBook will be shown in this phase. In this chapter, it will define the results of the analysis of the preliminary design and the results of the detailed design.

4.2 System Architecture

Before develop the product, the most important thing the developer need to do is the planned how the structure design of iBook and the system architecture. System architecture is the conceptual model that defines the structure, behaviours and more view of system. The figure below shows the flow of the delivery of iBook to the process which by the student to achieve the iBook. Then, it already can be used by teacher or students.

Structural design of the iBook should be made clear that the developer knew how to apply the design in order to properly and there will be no problem where users are confused about the content of information in order iBook. For the structure design of iBook, the developer only produced one of basic flow for iBook and it will apply same flow for each unit. The table below show about the basic flow for iBook design.

Table 4.1 : Basic Flow For iBook Design

LEVEL OF INTERFACE	FLOW OF IBOOK
Level 1	
Level 2	
Level 3	

4.3 Preliminary Design

The preliminary design is about the storyboard design and the User Interface Design.

4.3.1 Storyboard Design

(refer Appendix A)

4.4 User Interface Design

User interface design includes the important element of multimedia such as visual, font, and text. To produce the interesting learning tool, the interfaces should have several elements in multimedia like image, text, audio and animation. When incorporating these elements together, developer need to make sure this elements are consistent with each other.

I. Navigation Design :

In this iBook, there do not have specific navigation design because it use the basic navigation such as next and previous button, the certain picture that can rollover image and play the sound. Users need to tap on the image or icon if they want to open it.

II. Input Design :

It is important for users to interact with the iBook. Instruction at below of widget used to assist the users recognize where they should tap to get more information. The widget without the instruction, it might the users miss some of the essential information that is hidden.

III. Output Design :

To gain more interest in the Science subject from the students especially gen-y, the iBook need to act same like textbook but it can insert a lot of image. There also have animation and sound that can get more understanding in some chapter. Besides that, it is more interactive book than the textbook.

IV. Metaphor :

In this project needs to have theme graphics that will more fun and look cheerful to capture user interests to buy the application. The theme that developers decided to use in this iBook project is the nature and the inside house theme but in cartoon version of design that will capture user interest to explore more on the subject. There are several multimedia elements such as animation and images to be insert in the iBook to increase the level of user interest on the subject. The following figure shows the project themes.

Figure 4.1 : The interface of iScience for chapter 1

Figure 4.1 : The interface of iScience for chapter 1

Figure 4.2 : The interface of iScience for chapter 2

Figure 4.2 : The interface of iScience for chapter 2

Figure 4.3 : The interface of iScience for chapter 3

Figure 4.3 : The interface of iScience for chapter 3

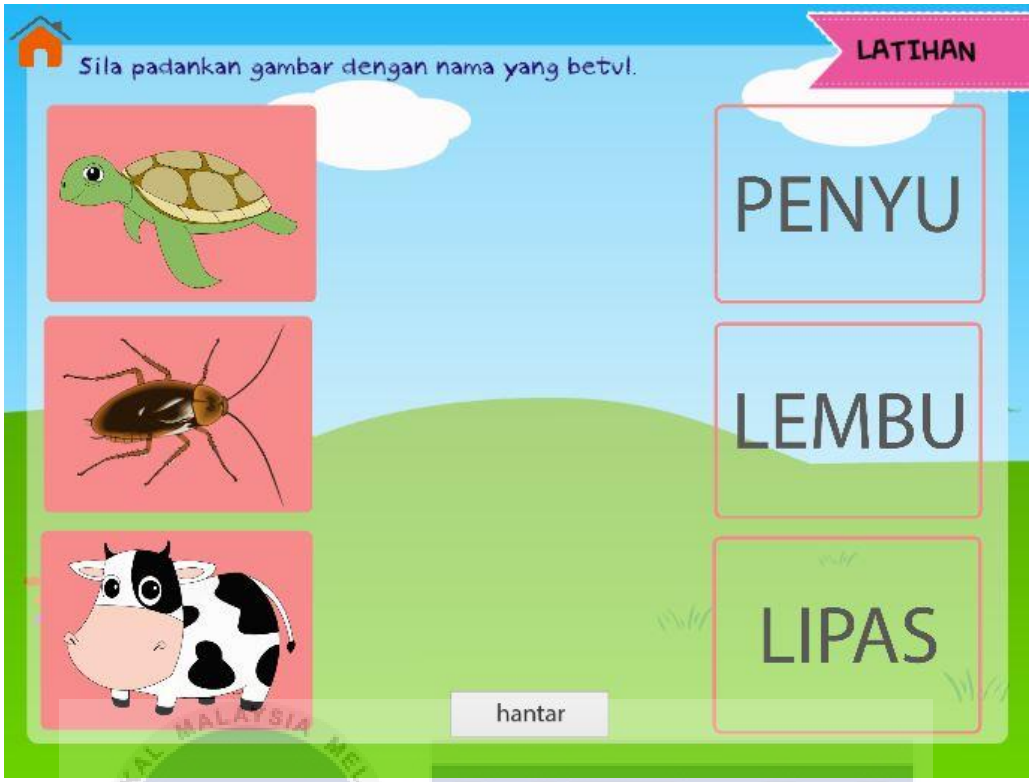


Figure 4.4 : The interface of iScience for exercise

I. Template Design :

The figure below show about the basic interface that was produced before developing the iBook.

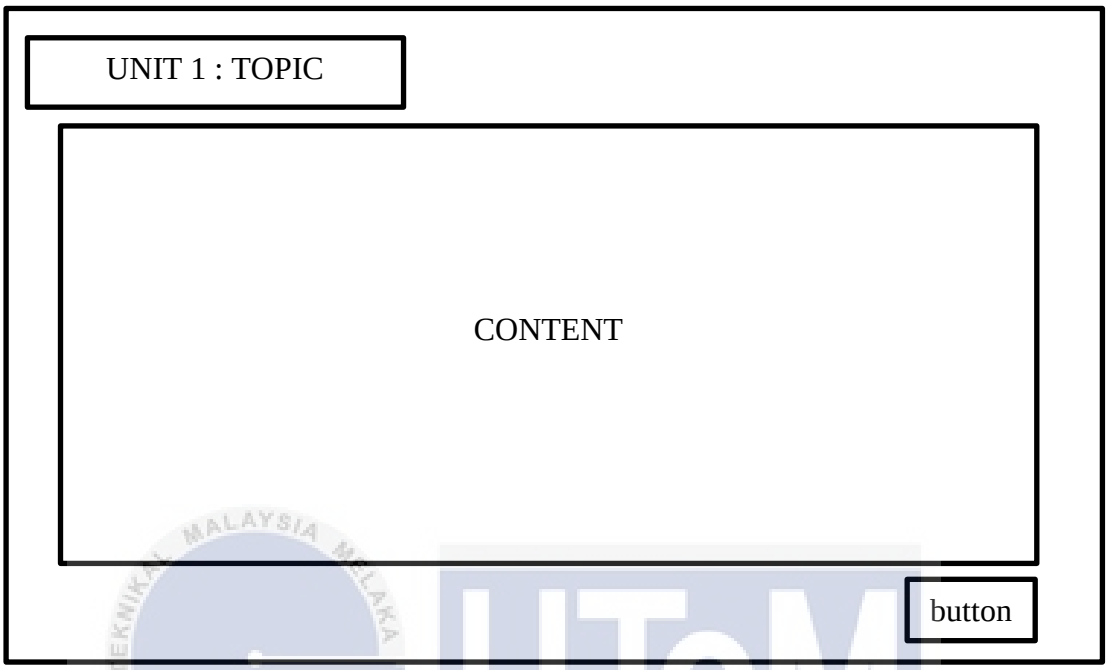


Figure 4.5: The Basic Interface of unit 1 in iScience (Before develop the IBook)

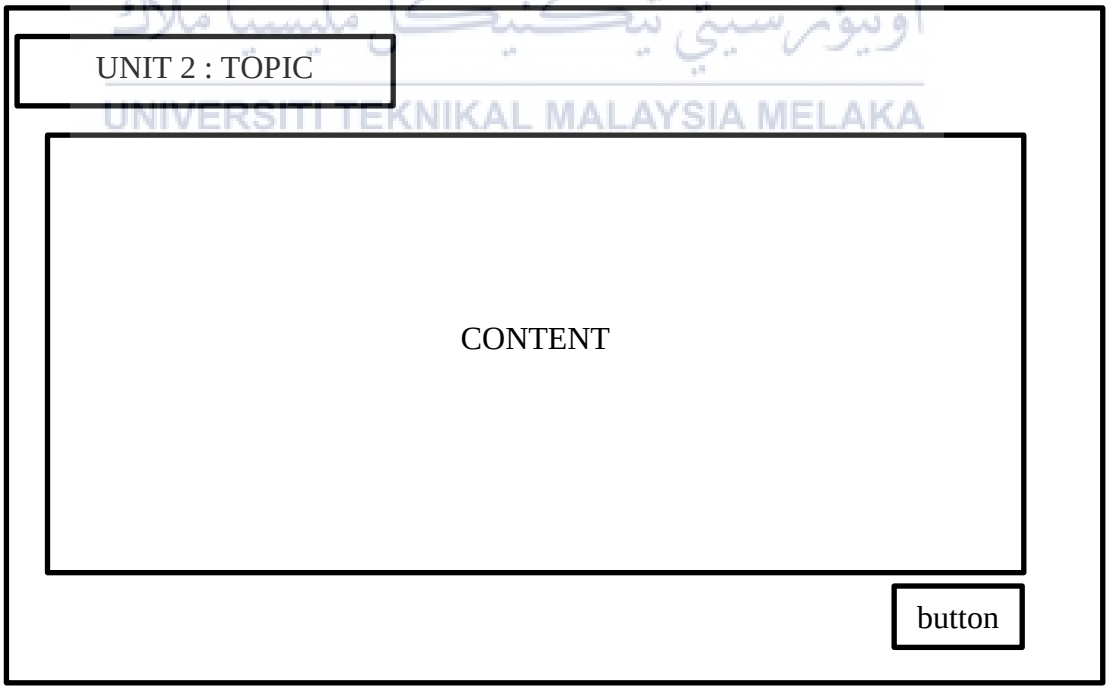


Figure 4.6: The Basic Interface of unit 2 in iScience (Before develop the IBook)

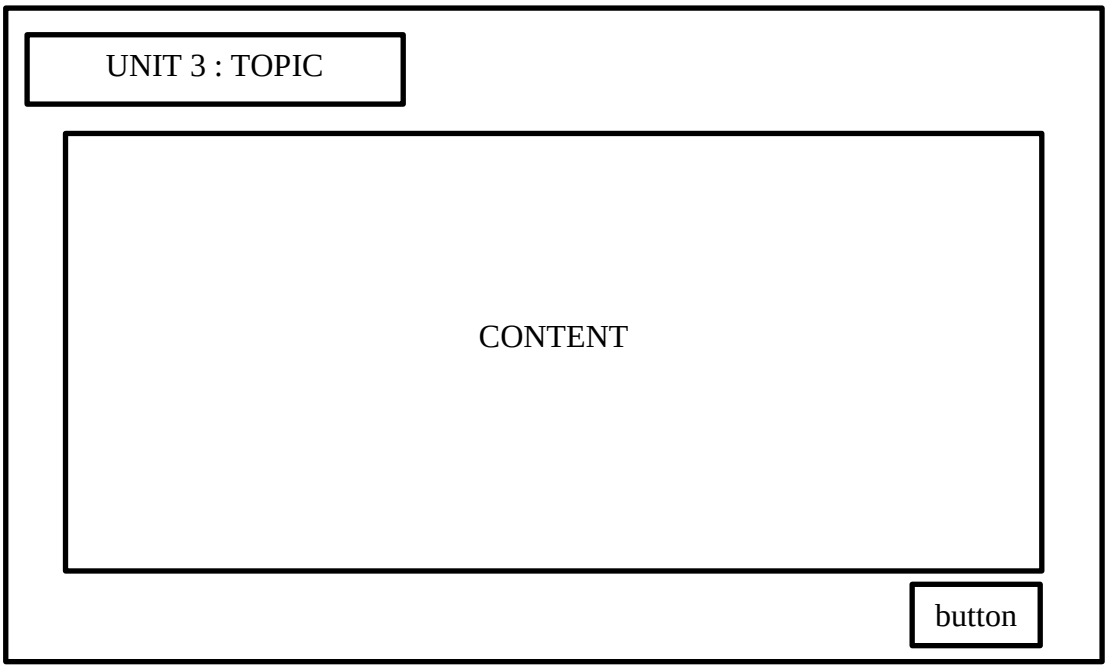


Figure 4.7: The Basic Interface of unit 3 in i iScience (Before develop the IBook)

CHAPTER V

IMPLEMENTATION

5.1 Introduction

This chapter will explain about the activities concerned in the implementation and the expected output that will be displayed. System implementation is the process that will be displayed. System implementation is the process that operationalizes the projected system into practice and is the media creation used is compatible to user.

All of the created media elements are integrated to be put into the iBook. The integration process of each media is explicated in detail in the subtopic of this chapter. The next subtopic is regarding on the environment setup and the version control procedure which describes in detail about the plug- in, the process of implementing the product, as well as the version of the product. There is some control to be taken while doing the product configuration management.

The last part of this chapter describes about the status for each of the progress of development which is observed through a Gantt Chart built in the previous chapter. The conclusion of the whole chapter is then concluded in the conclusion part of the chapter.

5.2 Media Creation

Media creation is one of the core parts for developing an iBook as putting text alone is not enough to encourage student's engagement. As we concerned, there are various elements of multimedia such as image, text, animation and audio. This section describes in detail about each of the media involves in creating the iBook.

- **Production of Text**

When implement the iBook, developer uses the default text provided by the Adobe Captivate. The iBook developed is the Science subjects and require the design to be minimized. Therefore, there are differences in the terms of font handling such as bigger font is used for the header and the subtopic of the subject while the medium font is used in the content creation. Font sizes and formats plays an important role in differentiate each part of the iBook.

Types of text are used in iBook are (type of font/size/color):

Title: Myrid pro, 45pt, black

Subtitle: Kindergarten, 21pt, blue black

Body: Tempus Sans ITS, 41 pt, dark purple

Title of image/table/interactive: Buxton Sketch, 48pt, purple

- **Production of Graphics**

For the graphics, developer uses majority the PNG as graphic format because it was created as free and better alternative. The developer also used this iBook is just a 2D image which is created using Adobe Illustrator and editing using Adobe Photoshop and Adobe Illustrator. All of the images used in this iBook are taken from the internet and originally edited and created using Adobe Illustrator.

Figure 5.1: Adobe illustrator software and Adobe Photoshop software

- **Production of Audio**

  Audio also is one of element in multimedia. Most of the concept of audio designed in this iBook is obtained from the free internet. In this project, are used to gain more interest from student to learn Science. Audio used as sound effect and also as voice that explains the images.

- **Production of Animation**

  For the animation, the developer produces the interactivity of between the images and text because the user can interact with the iBook and it will not bored when studies. The developer used Adobe Flash as a tool to animate the animation to be put in this project.

Figure 5.2: Adobe Flash software

5.3 Media Integration

The last process of the media production is the media integration. In this era, many free software that easy to get it. The software that used , it has advantages and disadvantage because it is open source, where owner of products wants user try using their products and they will define that user satisfied or not when using their products. All of the media elements created are organized and integrated based on the subtopic provided. Different 2D graphics are places in every single page of the iBook to encourage and interest user to have better engagement with the system.

5.4 Product Configuration Management

This section explains on the design and the process of configuration management setup for this project.

- **Configuration Environment Setup**

  After completed the iBook that was created using Adobe Captivate, the developer needs to export the file from .swf to .pdf format. The iBook also can be transferred into iPad. File format for the Adobe Captivate is .swf and the audio format that can be insert into iBook are .mp3, .mov and others. The other information is the iBook can be open in handheld devices.

5.5 Implementation Status

The status of the progress of development for each of the component and module involves during the production of this iBook is briefly explained to indicate the implementation status for each of them. The details are shown in the table below.

Table 5.1: Status of Component Implementation

Component	Description	Duration to Complete	Date Completed	Status
(Research and Explore)	Information gathering regarding on Adobe Captivate application and types of media element to be include.	2 weeks	Week 2	On time
(Create Development Plan)	Plan and sketch the interface of iBook content along with the media element	2 weeks	Week 6	On time
(Screen Design iBook Content)	Apply and complete the screen design for iBook content	4 weeks	Week 15	Delay
(Development of Multimedia Element)	Create and integrate media elements (image, animation, audio)into Adobe Captivate.	1 week	Week 7	On time
(Implementation of iBook	Complete and export the iBook into pdf format and launch on iBook application.	1 week	3 days	On time
(System Testing)	Perform System testing and results obtained is analyzed and conclusion is made.	4 weeks	Week 5	On time

5.6 Conclusion

As a conclusion, this chapter concludes the process of implementing the media elements such as text, images, animation and audios into the iBook. In addition, the process of configuring each of the software and application used to create the media elements are also discussed in this chapter. As there are different media elements need to be integrated in an iBook, there is various way of integrating each of the elements that is briefly explained in the chapter of implementation. The conclusion has been made and table showing the status of implementation for each module is constructed.

The next chapter is the chapter where all of the testing will be made. The next process is to tabulate the data obtained from the survey and to analyse the results. The user acceptance testing is also tested in order to measure user's interest on using the iBook.

CHAPTER V1

TESTING

6.1 Introduction

In this chapter, testing stages are explained. Testing stage one consist of Lecturers of Multimedia Design, stage two consists of Teachers who teach the Dunia Sains dan Teknologi subjects in primary school and the last stage is students who takes Dunia Sains dan Teknologi subject in primary schools. Stages one and two which are Lecturers of Multimedia Design and teachers are made to evaluate the students experience using iBook.

The good and best way to investigate the product should be done with the planned users. Besides, it will show the product's absences which need to be improve. In every three stages which included Multimedia Designer, teachers and students, the results of the test will be analyzed.

6.2 Test Plan

6.2.1 Test Organization

In this iBook project, the test users divided into three types of users such as the Multimedia Design lecturer, the primary school teacher who teaches the Dunia Sains Dan Teknologi subject and the students who take the Dunia Sains Dan Teknologi subject in primary schools.

a) The Multimedia Design lecturer

These testers are the lecturers who were involved in the field of multimedia design and they have experienced and knowledge about interaction and interface design in the products. Using their experience and knowledge, they will give their comment and respond about the product. The lecturers of multimedia were test which is including the overall reaction to the software, the screen design, the system capabilities and the consistency of the product.

a) The Primary School Teacher

In this testing phase, developer decided to take the teachers who teach Dunia Sains dan Teknologi in primary schools as the second tester. It is very important because they have experienced in teaching the Science subject and they know about content and syllabus that provided in this iBook suitable or not to student use in learning. The teachers were test which is including the visibility of the system, user control and freedom, consistency of the product, the flexibility and efficiency of use, the feedback response and the satisfaction of the product.

b) Students who take Dunia Sains dan Teknologi subject in primary schools.

This user will be testing based on the content of iBook and the element of multimedia that applied in iBook. It can be included the satisfaction, the usefulness, the ease of use and the ease of learning of the product. They can make the comparison based on their experience learning in the classroom using Textbooks and iBook which

students feel more interested to learn the Science subject as other learning tools to support their study.

6.2.2 Test Environment

The testing process was held at Universiti Teknikal Malaysia Melaka (UTeM), Melaka and Sekolah Rendah Kebangsaan Taman Selasih, Gombak Selangor. The process and testing was accomplished by using handheld devices provided for them. First of all, the users need to explore the iBook by their own and then, the developers start to observe the students and give the teachers some of questionnaire to fill it. The testing product with some of the user testers is attached in Appendix E

6.2.3 Test Schedule

In this test schedule, it is control the timing for users to test the product during the testing activities. The testing has been done in three stages. The first stage is the lecturer of Multimedia Design, the second stage is the teachers who teach the Dunia Sains dan Teknologi in primary schools and the last stage is the students who were take Dunia Sains dan Teknologi subject in schools.

Table 6.1: Schedule of testing activities

	Stage 1	Stage 2	Stage 3
Tester	Lecturers of Multimedia Design	Teachers who teaching Dunia Sains dan Teknologi subject	Students who take Dunia Sains dan Teknologi subject
Number of testers	2 person	4 person	10 person
Test start	9.30 a.m	8.30 a.m	11.30 a.m
Test end	11.30 a.m	10.30 a.m	12.30 p.m
Duration	2 hours 30 minutes	2 hour 30 minutes	1 hour 30 minutes
Date	04 August 2016	05 August 2016	05 August 2016

6.3 Test Strategy

The testing strategy is to make convinced the users enjoy their time playing and does not feel boring and uninterested with this iBook product when they are given the opportunity to investigate, explore and observe the product by themselves. The test strategy that is used in completing the project is by measuring student's data before and after the learning process done.

For user tester of Lecturer in Multimedia Design, developer gives the product to them and then the expert will judge the overall of the products which include the screen design. For user tester of Teacher who teaches the Dunia Sains dan Teknologi subject, they also are given the product and make a judgement of visibility of the system, user control and freedom, the consistency of the product, the flexibility and efficiency of use, feedback response and the satisfaction of the product. The purpose of this test to expert users like Lecturer in Multimedia and the teachers is to evaluate the students experience of using iBook. For user tester students, they are exposed to two different approaches of learning process which are by using the text book and by using the iBook to testify the experience and able to increase student's interest of this new learning approach using iBook. Table below shows the detail of the test strategy made.

Table 6.2: Detail test strategy

	Text Book	**iBook**
Duration (minute)	20	20
Participant (students)	10	10
Reference Material	Text book – Dunia Sains dan Teknologi	iBook – Dunia Sains dan Teknologi

6.4 Test Implementation

6.4.1 Test Description

The product must be tested in an iBook which is an application on handheld devices. Users need to explore the product by themselves. Besides, users like teachers and lecturers in Multimedia Design also need to answer the questionnaire to give their comment and response about the iBook project.

There are three different questionnaire distributed for this project. First questionnaire is for the experts in Multimedia Design and Dunia Sains dan Teknologi which is included the question about the screen, system capabilities, consistency, visibility of the system, user control and freedom, flexibility and efficiency of use, feedback, satisfaction. Next, the questionnaire is for teachers who teach Dunia Sains dan Teknologi subject included the visibility of the system, user control and freedom, the consistency of the product, the flexibility and efficiency of use, feedback response and the satisfaction of the product. The last observation is for the students who take Dunia Sains dan Teknologi. In the observation, the answers that developer needs to know are the usefulness, ease of use, and ease of learning. For all questionnaire, the user's level satisfaction for experts and students is used below.

Table 6.3: User's level satisfaction for experts

bad	**1**	**2**	**3**	**4**	**5**	good

Table 6.4: User's level satisfaction for students

Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
□	□	□	□	□

6.4.2 Test Data

The result of questionnaire from user's tester will be together noted in a table according to their tests. The data that have been tested will be categorized according to the test individually. The table below shows the list name for each user's tester and the data is tabulated by separating the results obtained for each expert users and students. The sample of data obtained is attached in the appendix (see Appendix c).

Table 6.5: The list name of the lecturers in Multimedia Design

NAME	ACADEMIC QUALIFICATION	COMPANY
Dr. Naim Bin Che Pee	Lecturer Interactive Multimedia	Universiti Teknikal Malaysia Melaka
Muhammad Helmy Bin Emran	Lecturer Interactive Multimedia	Universiti Teknikal Malaysia Melaka

Table 6.6: The list name of the teacher in Dunia Sains Dan Teknologi

NAME	ACADEMIC QUALIFICATION	COMPANY
Suhaila Mansor	Ketua Panitia Sains Tahap 1	SK Taman Selasih
Silvi a/p Koundyannan	Guru Sains Tahap 1	SK Taman Selasih
Mohd Hafiz Azham Bin Elias	Guru Sains Tahun 1	SK Taman Selasih
Razak Bin Mohd Ali	Guru Sains Tahun 1	SK Taman Selasih

User Acceptance Testing (2 Multimedia Design lecturers)

Table 6.7: Tabulated data from User Acceptance Testing (Multimedia Design lecturers)

Question	Answer (scale)				
	1 (bad)	**2**	**3**	**4**	**5 (good)**
1.**Overall reaction to the software**	**-**	**-**	**--**	**1**	**1**
2.**Screen**					
Question i	**-**	**-**	**-**	**2**	**-**
Question ii	**-**	**-**	**-**	**1**	**1**
Question iii	-	-	-	**2**	**-**
3.**System Capabilities**					
Question i	-	-	**1**	**1**	**-**
Question ii	-	-	**1**	**1**	**-**
Question iii	-	-	-	**2**	**-**
Question iv	-	-	**1**	**1**	**-**
4.**Consistency**					
Question i	**-**	**-**	**-**	**2**	**-**
Question ii	**-**	**-**	**1**	**1**	**-**
Question iii	**-**	**-**	**1**	**1**	**-**
Score			**5**	**16**	**2**

Table 6.7 shows the data obtained from two expert users of Multimedia Design Lecturers from Universiti Teknikal Malaysia Melaka while doing the testing. The data is tabulate in a form of table to see the result and the pattern of answering the questions.

User Acceptance Testing (4 teachers)

Table 6.8: Tabulated data from User Acceptance Testing (Teachers)

Question	**Answer (scale)**				
	1 (bad)	**2**	**3**	**4**	**5 (good)**
1.Visibility of the system	**-**	**-**	**-**	**1**	**3**
2.User control and freedom	**-**	**-**	**1**	**-**	**3**
3. Consistency	**-**	**-**	**1**	**2**	**1**
4. Flexibility and efficiency of use	**-**	**-**	**1**	**2**	**1**
5. Feedback			**1**	**-**	**3**
6. **Satisfaction**	**Strongly Disagree**	**Disagree**	**Neutral**	**Agree**	**Strongly Agree**
Question 1	**-**	**-**	**-**	**3**	**1**
Question 2	**-**	**-**	**1**	**2**	**1**
Question 3	**-**	**-**	**1**	**1**	**2**
Question 4	**-**	**-**		**2**	**2**
Question 5	**-**	**-**	**1**	**2**	**1**
Question 6	**-**	**-**	**1**	**2**	**1**

	-	-			
Score	-	-	**8**	**17**	**19**

Table 6.8 shows the data obtained from 4 teachers from Sekolah Kebangsaan Taman Selasih, Gombak Selangor while doing the testing. The data is tabulate in a form of table to see the result and the pattern of answering the questions.

User Acceptance Testing (10 students)

Table 6.9: Tabulated data from User Acceptance Testing (students)

Question	**Answer (scale)**				
	Strongly Disagree	**Disagree**	**Neutral**	**Agree**	**Strongly Agree**
(Usefulness)					
Question 1	-	-	**2**	**3**	**5**
Question 2	-	-	-	**6**	**4**
Question 3	-	-	**1**	**4**	**5**
Question 4	-	-	-	**5**	**5**
(Ease of Use)					
Question 1	-	-	**1**	**4**	**5**
Question 2	-	-	**1**	**4**	**5**
Question 3	-	-	**1**	**6**	**3**
Question 4	-	-	**1**	**5**	**4**
(Ease of Learning)					

Question 1	-	-	-	**3**	**6**
Question 2	-	-	**2**	**3**	**6**
Question 3	-	-	-	**5**	**5**
Question 4	-	-	**1**	**5**	**4**
Score			**10**	**53**	**57**

Table 6.9 shows the data obtained from 10 students from Sekolah Kebangsaan Taman Selasih, Gombak Selangor while doing the survey and testing. The data is tabulate in a form of table to see the result and the pattern of answering the questions.

6.5 Test Result and Analysis

This section shows the charts based on the results obtained by the survey. The data are shown in the form of charts to easily analyze and conclude the results based on the data given. From the data above, the charts are summarize the results of students based on their learning approach is developed. The user acceptance Test is conducted to measure the user satisfaction on using the iBook. There are a few questions that are analysed and measured and the results for each of the questions are shown in the form of bar chart.

i. User Expert

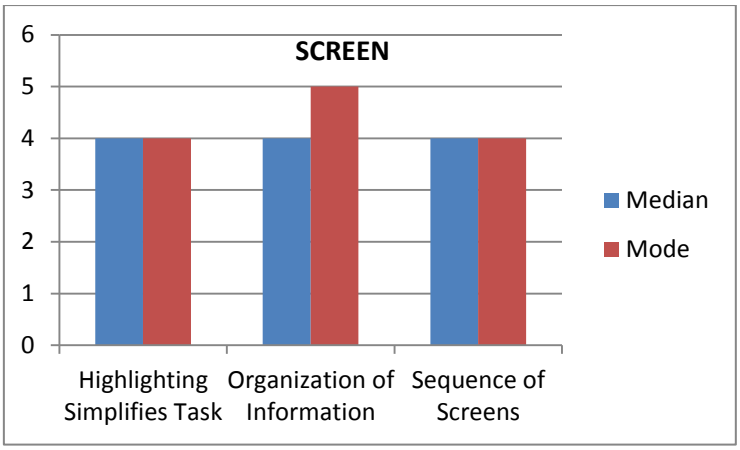


Figure 6.1: Bar chart for Screen

From the bar chart above, the level of the rate for all criteria is achieved which mean that the user experts of Multimedia Designer Lecturer testers are agreed with the screen part of this project. Hence, it can prove that the highlighting simplifies task, organization of information and sequence of screens is acceptable and suitable for students learning.

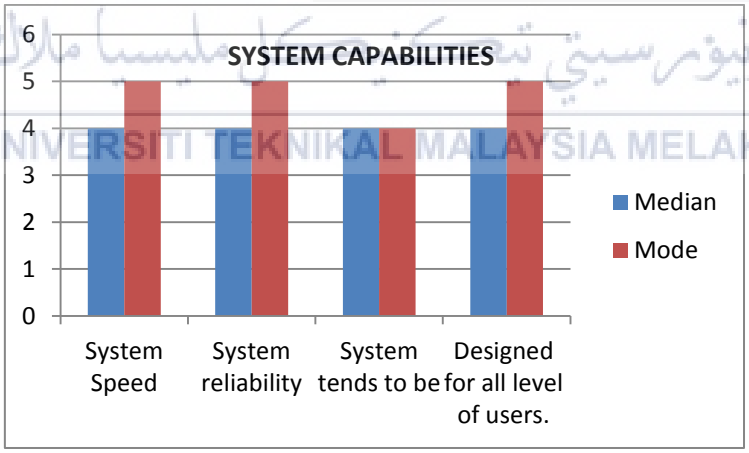


Figure 6.2: Bar chart for System Capabilities

From the bar chart above, the level of the rate for all criteria is achieved which mean that the user experts of Multimedia Designer Lecturer testers are agreed with the system capabilities of this projects. Hence, it can prove that the system speed, system reliability, system tend to be good and designed all of users is acceptable and suitable for primary students learning.

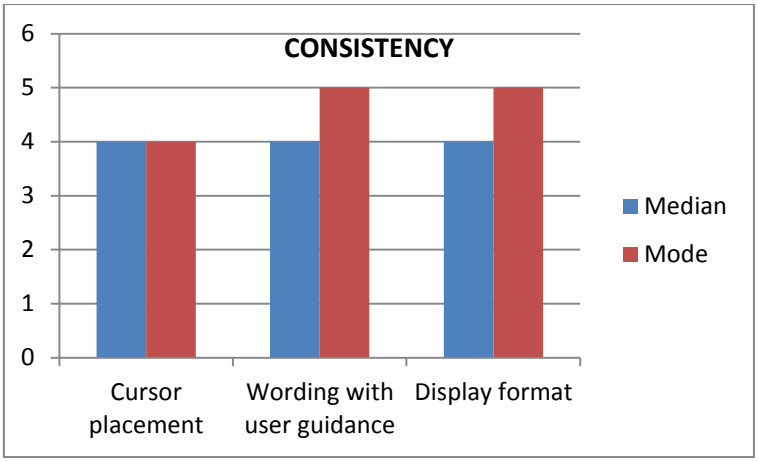


Figure 6.3: Bar chart for Consistency

From the bar chart above, the level of the rate for all criteria is achieved which mean that the user experts of Multimedia Designer Lecturer testers are agreed with the system capabilities of this projects. Hence, it can prove that the system speed, system reliability, system tend to be good and designed all of users is acceptable and suitable for primary students learning.

ii. Teacher

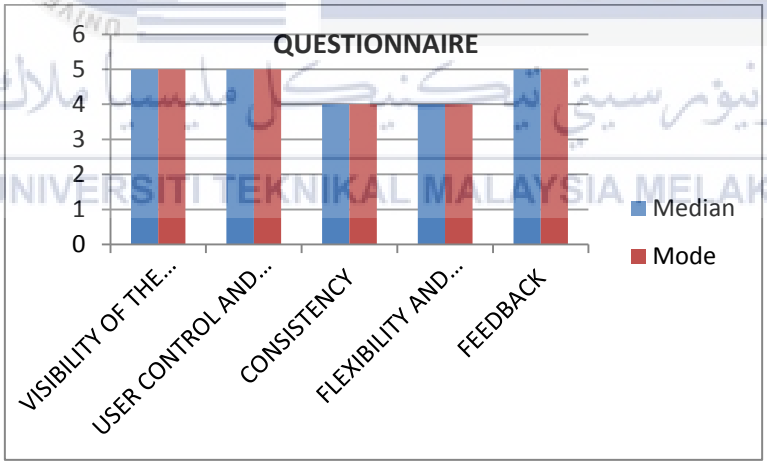


Figure 6.4: Bar chart for General Questionnaire

According to the bar chart above, the level of the rate for all criteria is achieved which mean that the user experts of Multimedia Designer Lecturer testers are agreed with the general questionnaire which include the visibility of the system, user control and freedom, consistency, flexibility and efficiency of use and feedback of this projects. Hence, it can prove that the entire general questionnaire is acceptable and suitable for primary students learning.

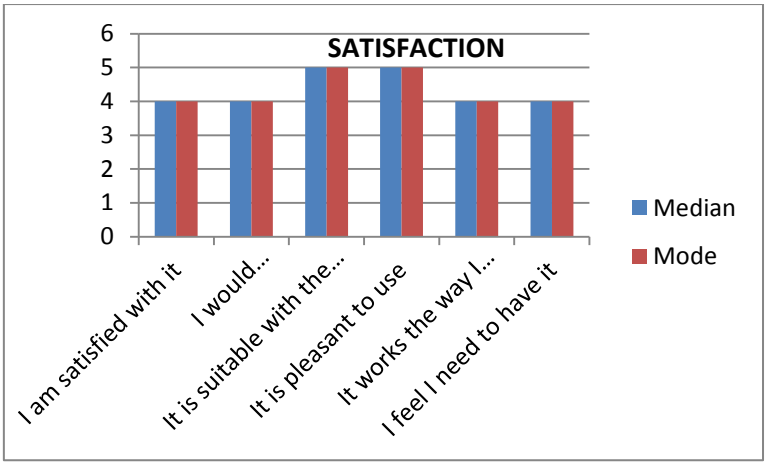


Figure 6.5: Bar chart for Satisfaction

According to the bar chart above, the level of the rate for all criteria is achieved which mean that the user experts of Multimedia Designer Lecturer testers are agreed with the satisfaction of this projects. Hence, it can prove that the entire questionnaire of satisfaction is acceptable and suitable for primary students learning.

iii. Student

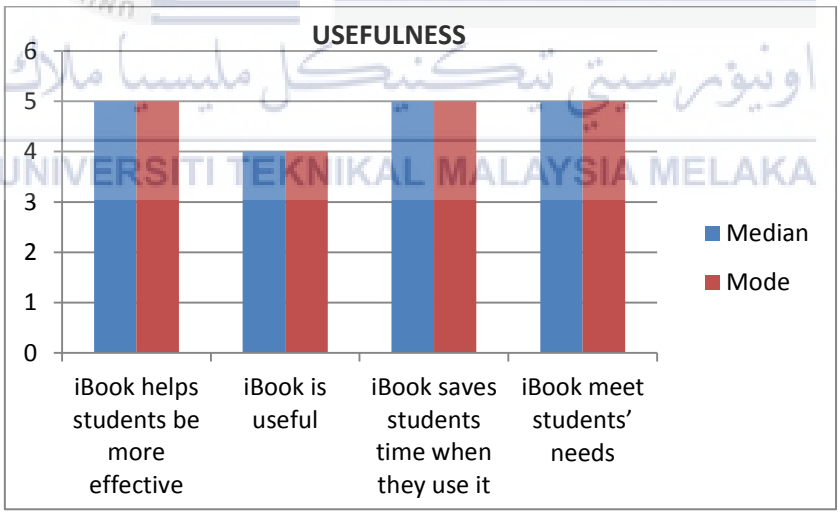


Figure 6.6: Bar chart for Usefulness

Refer to the bar chart in figure above; most of the students strongly agreed with the usefulness of the iBook. It is included iBook help them be more effective, iBook is useful, ibook saves time when they use it and iBook meet their needs.

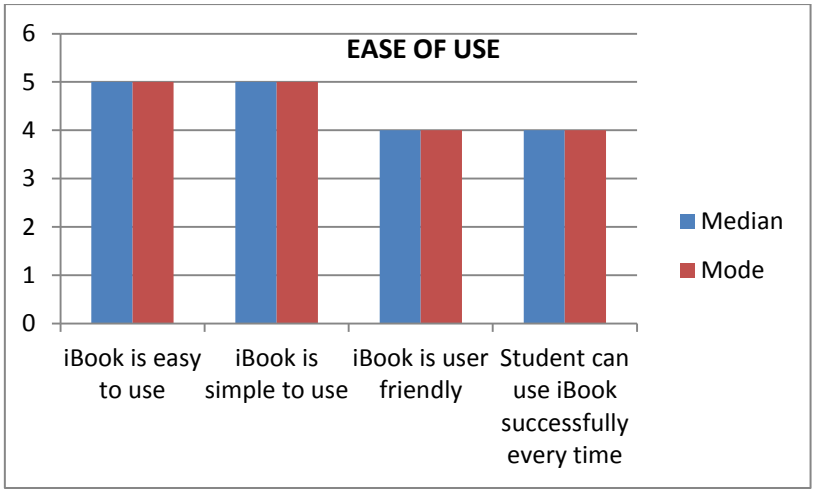


Figure 6.7: Bar chart for Ease of Use

From the bar chart above, most of the students strongly agreed with the ease of use of the iBook. It means that the iBook is easy to use, simple to use, iBook is user friendly, and students can use iBook successfully every time.

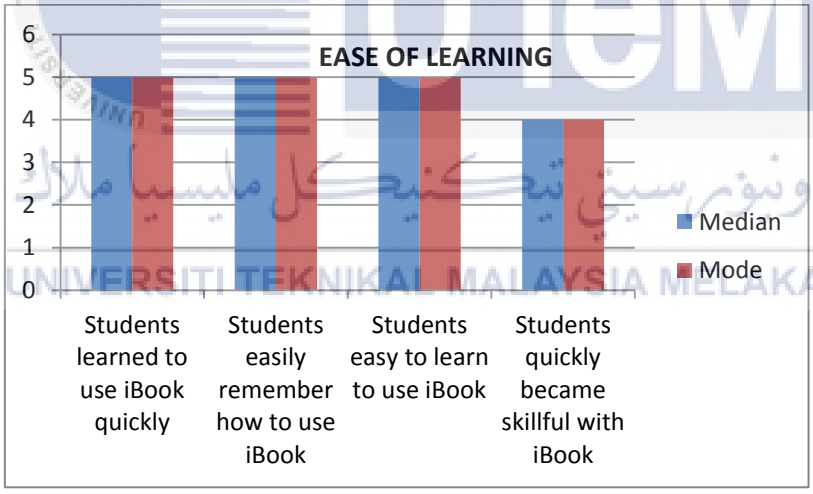


Figure 6.8: Bar chart for Ease of Learning

Refer to the bar chart in figure above; most of the students strongly agreed with the ease of learning of the iBook. It means that students learned to use iBook quickly, students easily remember how to use iBook, studnts easy to learn to use iBook and students quickly became skilful with iBook.

6.6 Conclusion

As a conclusion, all of the data obtained are analysed in details in order to measure the required information to fullfill the objectives of developing this iBook. The results analyzed are shown in the form of bar graphs and pie charts to facilitate the process of evaluating the data.

CHAPTER VII

CONCLUSION

7.1 Observation on Weaknesses and Strengths

After completed the all phases in developing product especially testing process, developer get from the observation how user feel about the system is for those who that familiar using handheld devices in their life. It also get define the strength and weakness of the product and need to improve in next time.

7.1.1 Project Strengths

- **Suitable to use as learning support tool after attend the class**

  This iBook can be uses as learning tool in the class and it must support the information discussion in the class between teachers and students. It is encourage them to study or do the revision after the revision after the session in class. iBook produced to attract students to study Science using the other tool after the tool currently used in the class.

- **Available to use anytime and anywhere**

  iBook can be used anytime students wants and easy to bring anywhere they want because normally iBook run in handheld devices. The student not to worry if they lost the notes because iBook not easy to broken or lost and it can download anytime they want and it can be shared with the others.

- **Interactive of textbook**

  This project has been done to create the interactive textbook of Dunia Sains dan Teknologi and it will build student interest toward that subject. The differentiation of the iBook and the textbook in usage of element in Multimedia because the students wants to fun and enjoy while study the Dunia Sains dan Teknologi especially the new generation now have different learning style. They will bored if the book is just using the picture and text in the black and white colour only.

7.1.2 Project Weaknesses

- **Only can be used on certain handheld devices.**

  The availability of iBook only can be used on certain handheld devices. It means only using certain devices like laptop can support the animation build in adobe flash. As we know that in other handheld device like ipad and tablet, their adobe reader was different format like in the laptop.

- **Lack of response feedback to user**

  The weaknesses of this iBook also that the response feedback for the system should be improve.

- **Lack of interactive activity**

  There are only one activity create in this iBook project. Developer should create more activity in every topic to make students and other users feel interesting and understand when using this iBook.

7.2 Propositions for Improvement

The improvement of the product is very important to produce high quality of product. From the analyzation and observation made, there are a few ways to improve the product in order to increase the students engagement with the iBook such as in future maybe developer can develop some apps to support .swf file animation in all types of handheld device. Next,

the existing activity is still not enough to capture user engagement with the iBook because each of the topic require different activity in the way of understanding the notes given.

7.3 Project Contribution

After successful of development the product, developer maybe will contribute the product at any schools for used to next year who teach and take the Dunia Sains dan Teknologi subject. This product will contribute from schools teacher to students and it will encourage students to explore themselves and study with it.

7.4 Conclusion

In a nutshell, the iBook of Dunia Sains dan Teknologi manage to be finished according to the schedule. The project has met all the three objective that are set. The project is able to investigate the factors on how to motivate the primary students by using iBook and this is proved in the study that had been done to Sekolah Kebangsaan Taman Selasih, Gombak Selangor teachers and students.

The second and the third objective is also met when the elements of multimedia are integrated with the content of the iBook and appears in each of the subtopic of the iBook. Last but not least, in the evaluation and testing phase, it is proved that using iBook is more effective than using the text book.

Besides, with all of three objectives met, it is conclude that the project is a success and proved to increase the students affectivity in learning the Dunia Sains dan Teknologi.

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Appendix A : Storyboard

Ibook Title

Image Of Cover Page

COVER PAGE

List Of Three Unit

Image

Table of content

Image

TABLE OF CONTENT

Home icon

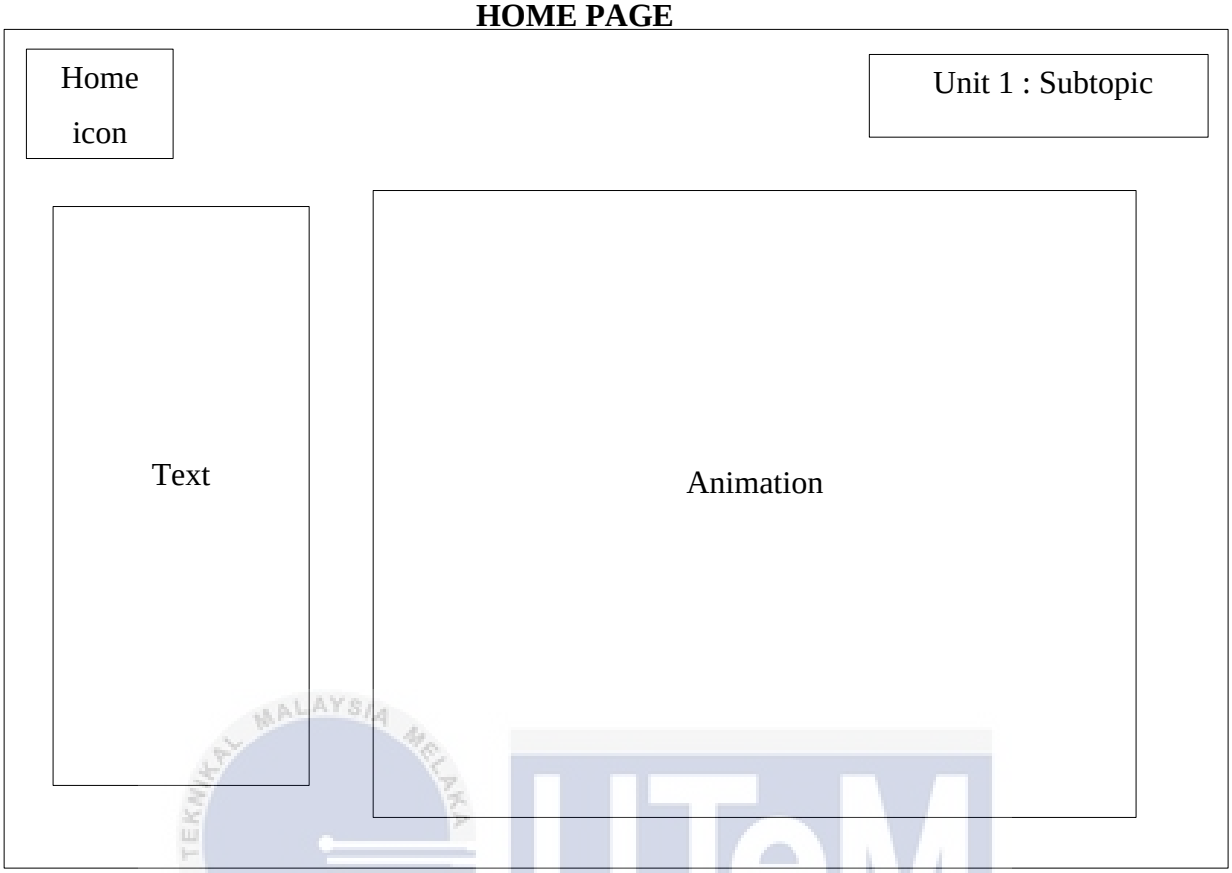
Unit 1 : Topic

Subtopic 1

Subtopic 1

Image

HOME PAGE



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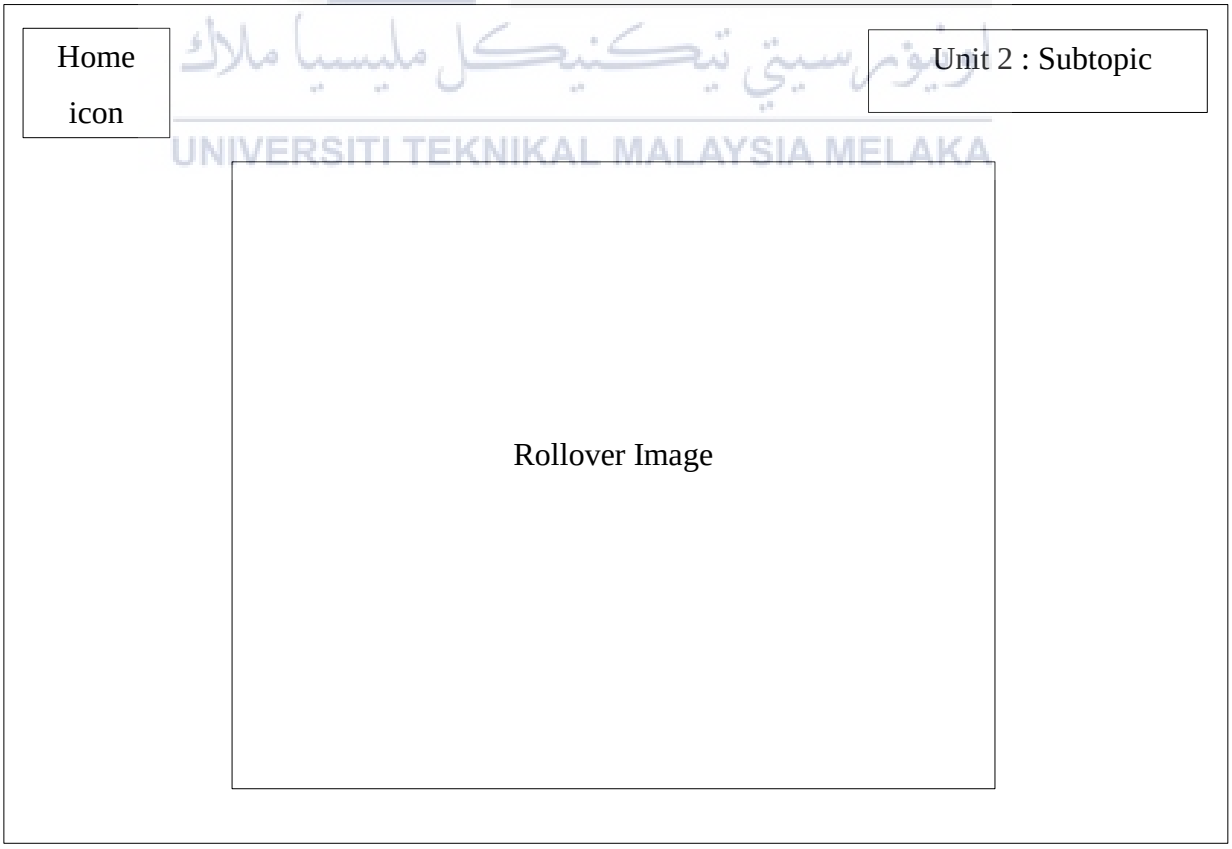

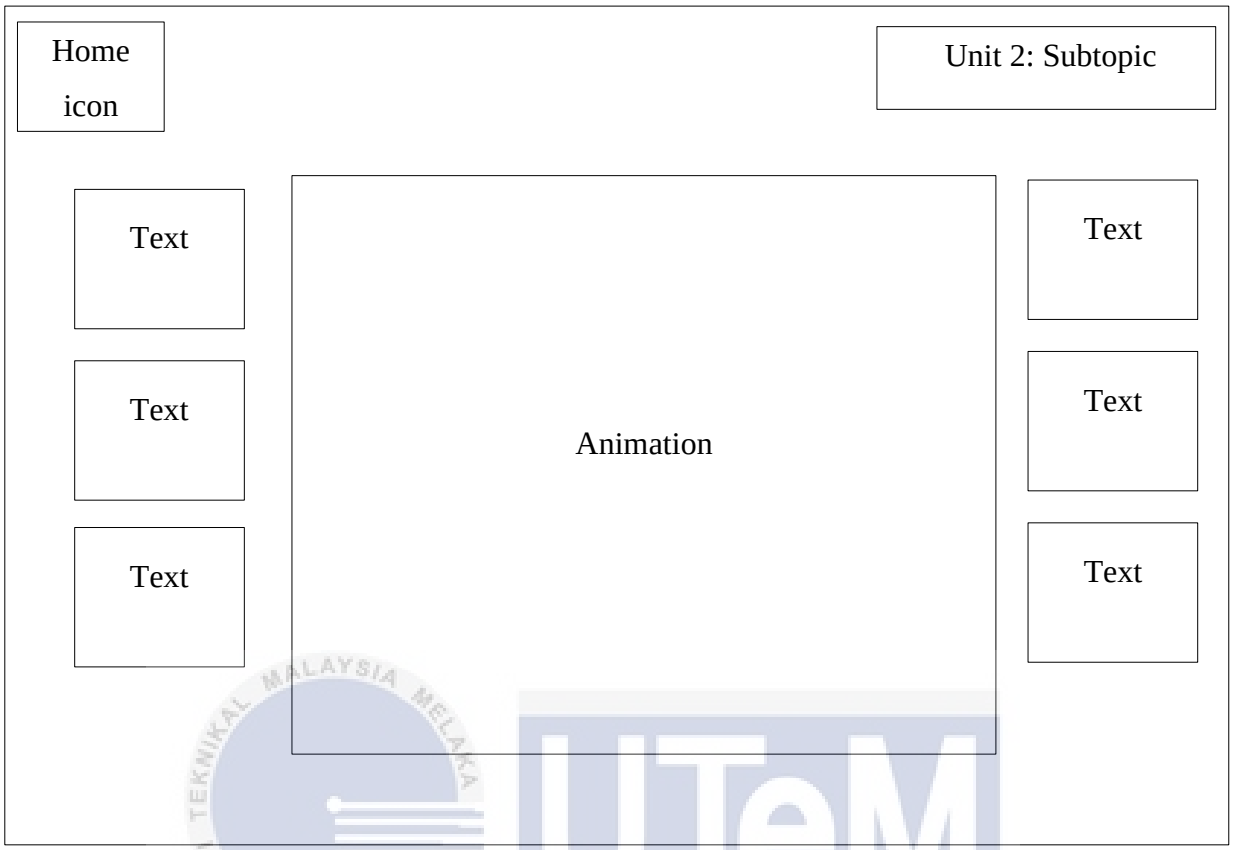

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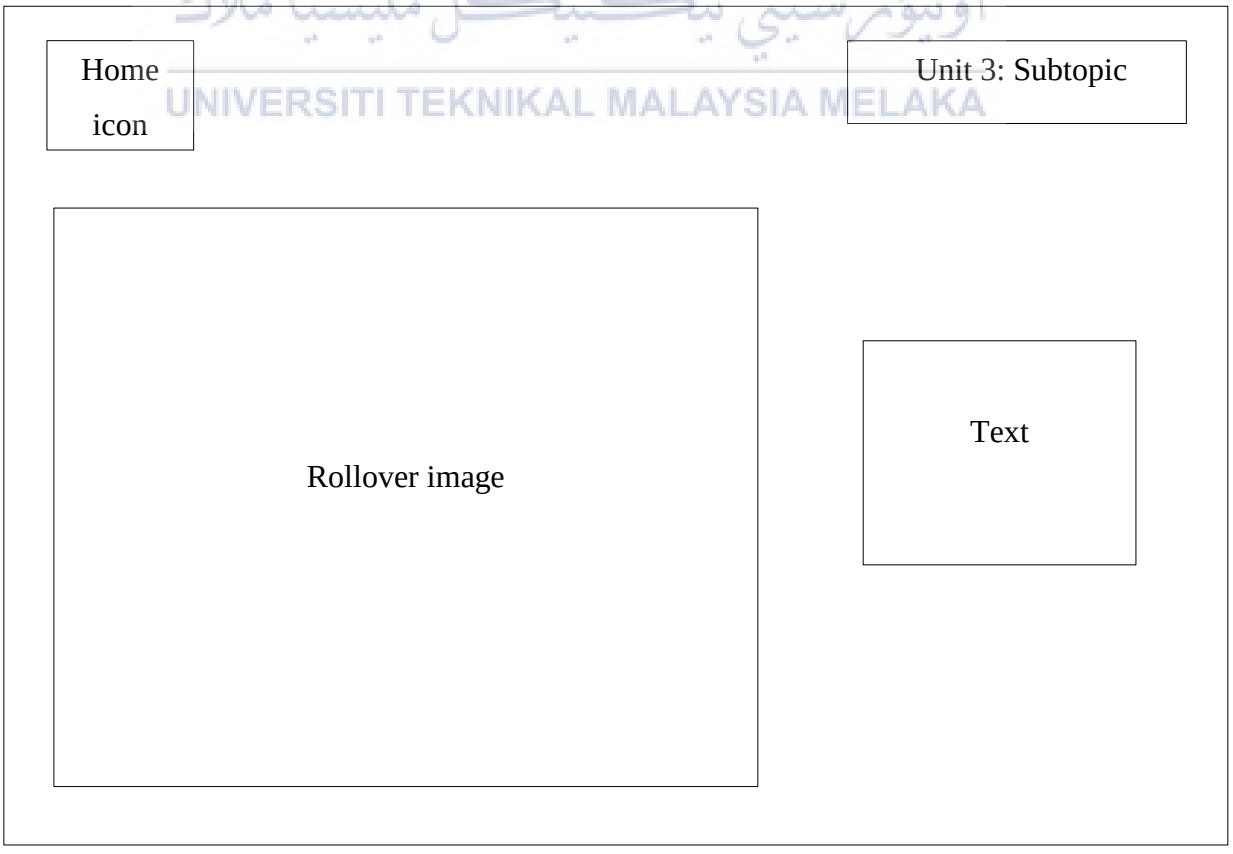

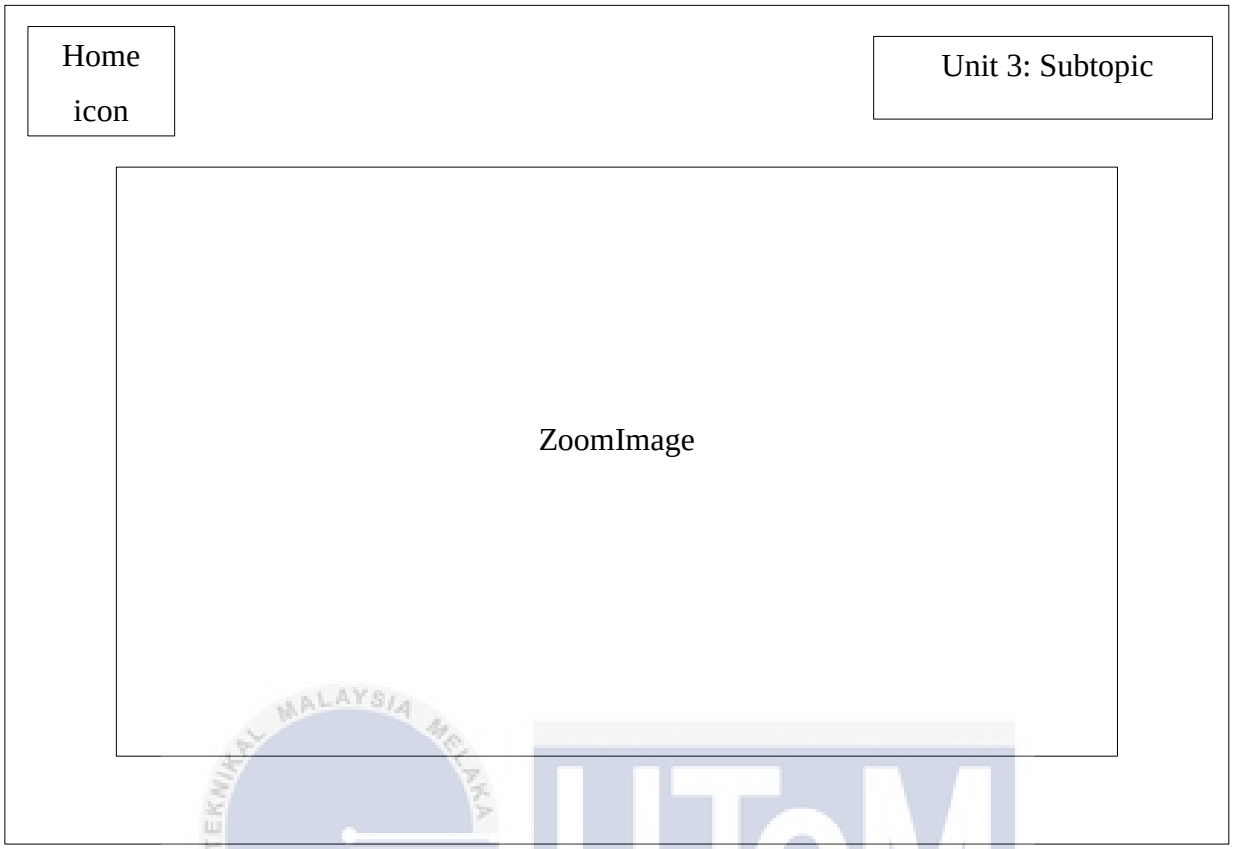

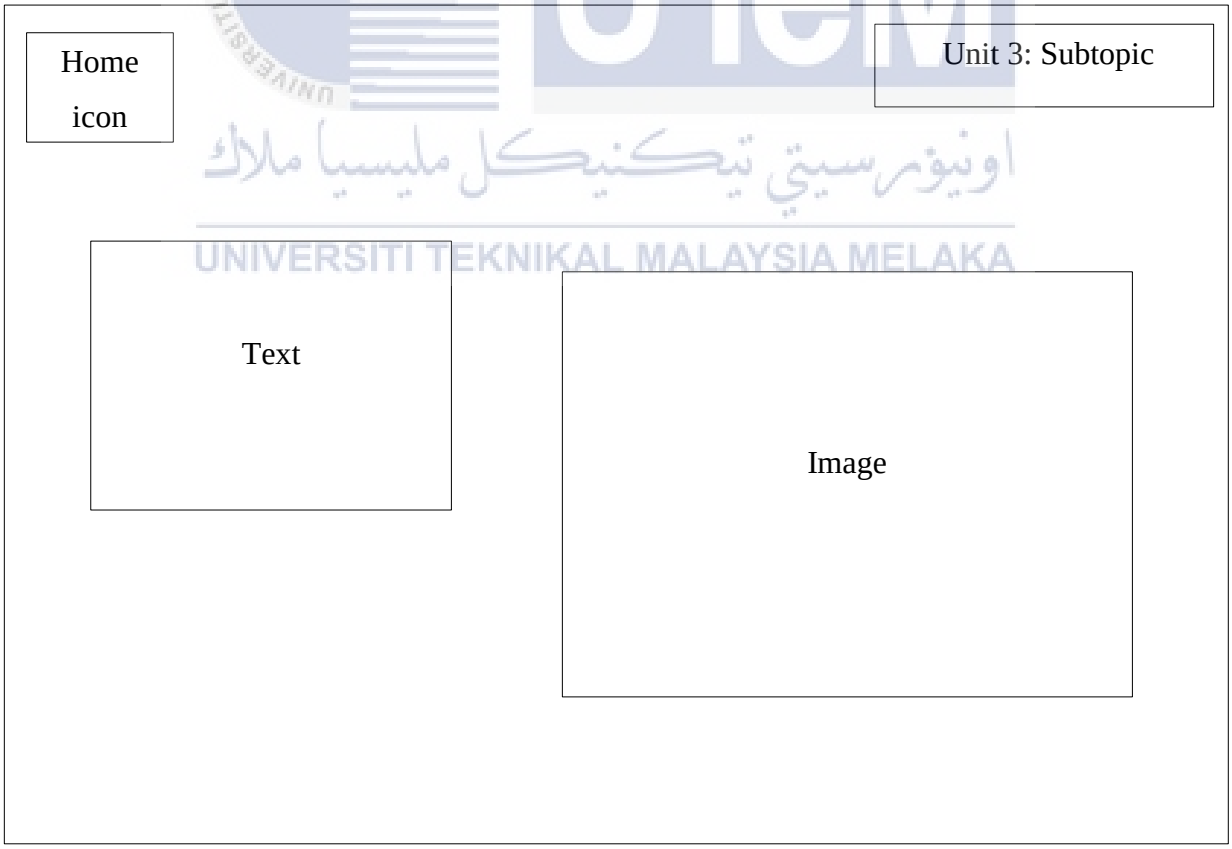

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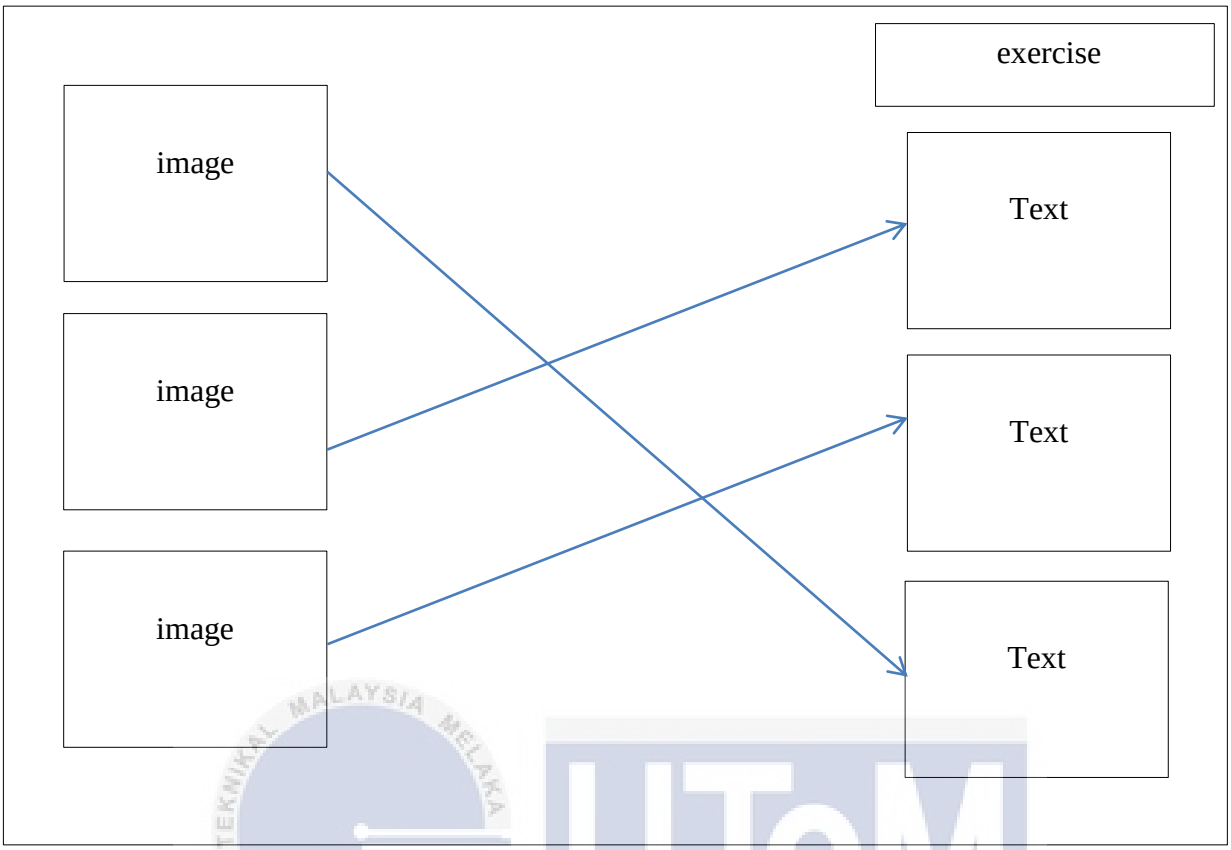

EXERCISE PAGE

Appendix B: Gantt chart

Duration of Task	Weeks															
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Confirmation of Supervisor and Project Title																
Submission of Project Proposal																
Information Gathering and Research for Chapter 1																
Submit Chapter 1- Introduction																
Explore Adobe Captivate and make research for Chapter																
Submit Chapter 2 – Literature Review																
Review and Complete Project Methodology																
Modification of Chapter 1 & 2 and submission of Chapter 1 & 2																
Analyzation of Project Requirement and Information Gathering for Chapter 3																
Create the plan for iBook development – Sketch the interface																
Submit the interface																
Get approval of interface and submission of Chapter 3																
Screen Design – The iBook																

Cover Page, table of content															
Improvement on the Sketch of the interface to be put in Chapter 4															
Screen Design – The Content of iBook															
Project Evaluation Part 1															
Design 2D image to be put in the iBook															
Submission of Chapter 4															
Project Implementation Analysis															
Completion & Submission of Full Report (Draft)															
Presentation of PSM 1 and II															

Appendix C: Sample Data

Appendix D : User Testing Product

Testing product with students

Testing product with teachers