INTERACTIVE BOOKS FOR COMPUTER GAMES SUBJECT

MUHAMMAD IMAN NAJMI BIN AMINUDDIN

UNIVERSITI TEKNIKAL MALAYSIA MELAKA

UNIVERSITI TEKNIKAL MALAYSIA MELAKA

BORANG PENGESAHAN STATUS LAPORAN

JUDUL: [INTERACTIVE BOOKS FOR COMPUTER GAMES SUBJECT]

SESI PENGAJIAN: [2020 / 2021]

Saya: MUHAMMAD IMAN NAJMI BIN AMINUDDIN mengaku membenarkan tesis Projek Sarjana Muda ini disimpan di Perpustakaan Universiti Teknikal Malaysia Melaka dengan syarat-syarat kegunaan seperti berikut:

1. Tesis dan projek adalah hakmilik Universiti Teknikal Malaysia Melaka.
2. Perpustakaan Fakulti Teknologi Maklumat dan Komunikasi dibenarkan membuat salinan untuk tujuan pengajian sahaja.
3. Perpustakaan Fakulti Teknologi Maklumat dan Komunikasi dibenarkan membuat salinan tesis ini sebagai bahan pertukaran antara institusi pengajian tinggi.
4. * Sila tandakan (✓)

_____	SULIT	(Mengandungi maklumat yang berdarjah keselamatan atau kepentingan Malaysia seperti yang termaktub di dalam AKTA RAHSIA RASMI 1972)
_____	TERHAD	(Mengandungi maklumat TERHAD yang telah ditentukan oleh organisasi / badan di mana penyelidikan dijalankan)
_____	TIDAK TERHAD	

UNIVERSITI TEKNIKAL MALAYSIA MELAKA

(TANDATANGAN PELAJAR)

Alamat tetap: No 32, Jalan 8C, Taman Mawar 2, Bandar Baru Salak Tinggi, Sepang 43900 Selangor

Tarikh: 21 Jun 2021

(TANDATANGAN PENYELIA)

Prof. Madya Ts. Dr. Hjh. Norasiken Bakar

Tarikh: 23 Jun 2021

INTERACTIVE BOOKS FOR COMPUTER GAMES SUBJECT

MUHMMAD IMAN NAJMI BIN AMINUDDIN

This report is submitted in partial fulfillment of the requirements for the Bachelor of [Computer Science (Interactive Media)] with Honours.

UNIVERSITI TEKNIKAL MALAYSIA MELAKA

FACULTY OF INFORMATION AND COMMUNICATION TECHNOLOGY
UNIVERSITI TEKNIKAL MALAYSIA MELAKA

2021

DECLARATION

I hereby declare that this project report entitled

[INTERACTIVE BOOKS FOR LEARNING COMPUTER GAMES

is written by me and is my own effort and that no part has been plagiarized

without citations.

STUDENT : : _____ Date : 21 Jun 2021

MUHAMMAD IMAN NAJMI BIN AMINUDDIN

UNIVERSITI TEKNIKAL MALAYSIA MELAKA

I hereby declare that I have read this project report and found

this project report is sufficient in term of the scope and quality for the award of

Bachelor of [Computer Science (Software Development)] with Honours.

SUPERVISOR : _____ Date : 23 Jun 2021

([Assoc. Prof. Ts. Dr. Norasiken Bakar])

DEDICATION

I might want to communicate my true thanks and appreciation to my supervisor, Assoc. Prof. Ts. Dr. Norasiken Bakar who has support and guide me in this final year project. Despite all the mistakes and errors, we still manage to get through all the obstacles. A million thanks to you.

After that, I want to say a special thanks to my classmates and friend who helped me a lot in this project. Especially my friend, Nurusshahadah Binti Tamby Suleiman who helped in suggesting several application for this project.

Finally, I must say thanks to my beloved parents, Aminuddin Bin Hassim and Murni Binti Muda, for their love, support and continuous encouragement throughout the course.

UNIVERSITI TEKNIKAL MALAYSIA MELAKA

ACKNOWLEDGEMENTS

I would also like to express my sincere thanks and appreciation to my Subject Matter Expert, Dr Ahmad Naim Bin Che Pee @ Che Hanapi who has helped me in giving feedbacks regarding my Interactive E-Book Development. He had given me a lot of advice and guidance when carrying out this project. A million thanks to him.

Plus, I might want to offer my thanks to my companions for giving me backing and help during the way toward finishing this venture. At long last, I should express profound gratitude to my folks and my family for their affection, tolerance, unrestricted help, and ceaseless support all through the course.

UTeM
اونيۏرسيتي تيکنيکل مليسيا ملاک
UNIVERSITI TEKNIKAL MALAYSIA MELAKA

ABSTRACT

The name of this project is Interactive Books For Computer Games Subject which is proposed by my Supervisor, Assoc. Prof. Ts. Dr. Norasiken Bakar. The main purpose of this project is to design an interactive book that could aid the students to understand even more regarding the contents of the subject. Besides that, it is also to identify the suitable media elements when developing an interactive e-book. The interactive book can be accessed by any application that able to open a .epub file format such as Kotobee Author or Books on Mac. The methodology that has been chosen to develop this project is ADDIE Model. The reason for choosing this model is because it is proven to be a suitable method for designing a learning material. The project will be developed using various software but mainly Kotobee Author as it is the main application to create an interactive e-book. Using the said application, it can implement the media elements chosen such as text, images, video, audio and animations into the interactive e-book. The project design will refer to the questionnaire that had been delivered to the target users and the teaching plan designed by UTeM. From this project, the multimedia elements will be fully utilized to ensure the success of the development of the interactive book. Students will be able to learn more additional content regarding the subject as it will increase the effectiveness of studying when using an interactive e-book. The Evaluation method used is the Pilot Test while the Testing method used is The Control and Experiment group method, which both phases has been able to carry out exactly as planned. Conclusively, the project is a success with the objectives of the project was able to achieved.

UNIVERSITI TEKNIKAL MALAYSIA MELAKA

ABSTRAK

Nama projek ini adalah Buku Ineracktif Untuk Subjek Permainan Komputer yang telah dicadangkan oleh penyelia saya, Prof. Madya Ts. Dr. Hjh. Norasiken Bakar. Tujuan utama projek ini adalah untuk menghasilkan sebuah buku interaktif yang boleh membantu pelajar untuk memahami lebih banyak mengenai subjek tersebut. Selain itu, projek ini juga bertujuan untuk mengenal pasti elemen media yang sesuai untuk digunakan bagi menghasilkan sebuah interaktif e-book. Buku interaktif yang dihasilkan boleh diakses oleh mana-mana aplikasi yang dapat membuka format fil .epub seperti kotobee Author atau Books di Mac. Projek metodologi yang dipilih adalah ADDIE Model. Antara sebab model tersebut dipilih adalah kerana ia terbukti menjadi sebuah kaedah yang sesuai untuk merancang projek yang melibatkan bahan pembelajaran. Projek ini akan dibangunkan dengan menggunakan pelbagai perisian terutamanya Kotobee Author kerana ia adalah aplikasi utama untuk membuat interaktif e-book. Dengan menggunakan aplikasi tersebut, ia dapat menerapkan elemen media yang dipilih seperti teks, gambar, video, audio dan animasi ke dalam interaktif e-book. Reka bentuk projek akan merujuk kepada soal selidik yang telah diedarkan kepada pengguna sasaran dan rancangan pengajaran yang dihasilkan oleh pihak UTeM. Melalui projek ini, elemen multimedia akan digunakan sepenuhnya untuk memastikan kejayaan pengembangan buku interaktif. Pelajar akan dapat mempelajari lebih banyak kandungan tambahan mengenai subjek yang akan membantu dalam meningkatkan keberkesanan belajar ketika menggunakan interaktif e-book. Kaedah Penilaian yang digunakan adalah kajian rintis manakala kaedah yang digunakan bagi fasa pengujian adalah Kumpulan Kawalan dan Eksperimen. Kedua-dua kaedah berjaya dilaksanakan dengan jayanya. Secara konklusif, projek ini telah berjaya mencapai objektif yang telahditetapkan.

UNIVERSITI TEKNIKAL MALAYSIA MELAKA

UNIVERSITI TEKNIKAL MALAYSIA MELAKA

TABLE OF CONTENTS

PAGE

DECLARATION ..... **II**

DEDICATION ..... **III**

ACKNOWLEDGEMENTS ..... **IV**

ABSTRACT ..... **V**

ABSTRAK ..... **VI**

TABLE OF CONTENTS ..... **VIII**

LIST OF TABLES ..... **XIII**

LIST OF FIGURES ..... **XVI**

LIST OF ABBREVIATIONS ..... **XXI**

LIST OF ATTACHMENTS ..... **XXII**

CHAPTER 1: INTRODUCTION **1**

1.1 Introduction ..... **.1**

1.2 Problem Statements……**2**

1.3 Objectives……**2**

1.4 Project Scope……**3**

1.5 Project Significant……**3**

1.6 Conclusion……**4**

UNIVERSITI TEKNIKAL MALAYSIA MELAKA

CHAPTER 2: LITERATURE REVIEW AND PROJECT METHODOLOGY..5

2.1 Introduction..... 5

2.2 Objective Definition……..……..5

2.2.1 To identify the suitable elements of multimedia in developing an interactive book throughout the duration of the project……...5 - 7

2.2.2 To design an interactive book that could aid the students to understand even more regarding the contents of the subject……..8 -10

2.2.3 To develop more knowledge regarding the Computer Games Development subjects especially upon computer games genre, hardware and software used in modern time…….11 - 13

2.2.4 To evaluate the effectiveness of the Computer Games Development content within the interactive book using the media elements that can be used with E-Book Software tools…….13 - 14

2.3 Domain……..…….……15

2.4 Existing System……..……15 - 25

2.4.1 Comparison of Existing System……..19 - 25

2.4.2 Media Elements Used By Other Existing System……25 - 32

2.5 Project Methodology……..……....33 - 38

2.5.1 Educational Goals……34 - 38

2.6 Project Requirement……..……38 - 39

2.6.1 Software Requirement……39

2.6.1 Hardware Requirement……..39

2.7 Conclusion……...……..39

CHAPTER 3: ANALYSIS..... 40

3.1 Introduction..... 40

UNIVERSITI TEKNIKAL MALAYSIA MELAKA

3.2 Current Scenario Analysis……40 - 49

3.2.1 Requirement Analysis…….41 - 45

3.2.2 Software Requirement…….45 - 46

3.2.3 Hardware Requirement……..…47

3.2.4 Project Schedule and Milestones……48

3.3 Conclusion……..…..……48

CHAPTER 4: DESIGN..... 49

4.1 Introduction..... 49

4.2 System Architecture……..……...49 - 51

4.3 Preliminary Designs……..……...51 - 52

4.3.1 Storyboard Designs……..……51

4.4 User Interface Design……..52 - 61

4.4 Conclusion……..……..61

CHAPTER 5: IMPLEMENTATION..... 62

5.1 Introduction..... 62

5.2 System Implementation……..…….62 - 68

5.3 Media Integration…….…...……...69- 70

5.4 Product Configuration Management…….…….……..71 - 72

5.5 Conclusion……..……..72

CHAPTER 6: TESTING..... 73

6.1 Introduction..... 73

6.2 System Implementation……..……..……..……....73 - 75

6.2.1 Test User……..……..……..……73 - 75

6.2.2 Test Environment……...…...……..…….……74

6.2.1 Test Schedule……..……..……74 - 75

UNIVERSITI TEKNIKAL MALAYSIA MELAKA

6.3 Test Strategy……..……....75 - 78

6.3.1 Pilot Test……..……..……75 - 76

6.3.2 Testing Phase……..……..…….……77 - 78

6.4 Test Implementation……...……..……...78 - 92

6.4.1 Test Description…….……78- 81

6.4.1.1 Pilot Test……..……..……..78 - 79

6.4.1.2 Testing Phase……..……79 - 81

6.4.2 Test Data……...……...……..……81 - 89

6.4.2.1 Pilot Test……..…..……..81 - 90

6.4.2.1.1 IT Expert……..……82 - 84

6.4.2.1.2 Subject Matter Expert…….……85 - 87

6.4.2.1.3 Students……...……..……88 - 90

6.4.2.2 Testing Phase……..……91 - 92

6.5 Test Results and Analysis……...……..……...93 - 111

6.5.1 Pilot Test……...……..……93 - 108

6.5.1.1 IT Expert……..……93 - 98

6.5.1.2 Subject Matter Expert……..……..…….98 - 103

6.5.1.3 Students……..……..……103 - 108

6.5.2 Testing Phase……...…....……..……109 - 112

6.6 Analysis Testing……...……..…….……...113 - 114

6.6.1 Pilot Test……...……..…….....113 - 111

6.5.1.1 IT Expert……..……..…113

6.5.1.2 Subject Matter Expert……..…...……..……113 - 114

6.5.1.3 Students……..……..……114

6.5.2 Testing Phase……...…....……..……...115

UNIVERSITI TEKNIKAL MALAYSIA MELAKA

6.7 Conclusion……..……..……..116

CHAPTER 7: CONCLUSION..... 117

7.1 Introduction..... 117

7.2 Observation on Strength and Weakness.....117 - 118

7.2.1 Project Strengths ..... 117 - 118

7.2.2 Project Weakness 118

7.3 Proposition for Improvements..... 119

7.4 Project Contribution..... 120

7.5 Conclusion 120

REFERENCES……...170 - 173

ORIGINALITY REPORT……....174 - 182

UTeM
اونيۏرسيتي تيکنيکل مليسيا ملاك
UNIVERSITI TEKNIKAL MALAYSIA MELAKA

LIST OF TABLES

PAGE

Table 2.1 Contents and Descriptions……32

Table 2.2 Software Requirement……39

Table 2.3 Hardware Requirement……...39

Table 5.1 Production of Texts for Interactive Book for Game Development……...……...62

Table 5.2 Production of Images for Interactive Book for Game Development……..……...63 - 64

Table 5.3 Production of Audios for Interactive Book for Game Development……...65 - 66

Table 5.4 Production of Video for Interactive Book for Game Development……...66 - 67

Table 5.5 Production of Animations for Interactive Book for Game Development……...67 - 68

Table 5.6 Hardware Requirement for Interactive book For Game Development…….....71

Table 5.6 Software Requirement for Interactive book For Game Development…….....72

UNIVERSITI TEKNIKAL MALAYSIA MELAKA

Table 6.1 Test Schedule for the Pilot Test……74

Table 6.2 Test Schedule for the Testing Phase……75

Table 6.3 Average Rating for Pilot Test Scoring……76

Table 6.4 Total Mean for Pilot Test Scoring…..……76

Table 6.5 Satisfactory Scale for Interface, Design and Consistency Construct Score by IT Expert in Evaluation Form …..…..……93

Table 6.6 Satisfactory Scale for Ease of Interface Use Construct Score by IT Expert in Evaluation Form……...94

Table 6.7 Satisfactory Scale for Multimedia Elements Use Construct Score by IT Expert in Evaluation ……..……..95

Table 6.8 Satisfactory Scale for Interactivity Construct Score by IT Expert in Evaluation Form ……..96

Table 6.9 Satisfactory Scale for Technology and Accessibility Construct Score by IT Expert in Evaluation Form……..…97

Table 6.10 Satisfactory Scale for Presentation Construct Score by Subject Matter Expert in Evaluation Form……..98

Table 6.11 Satisfactory Scale for Richness of Subject Construct Score by Subject Matter Expert in Evaluation Form……..99

Table 6.12 Satisfactory Scale for Motivation and Attractiveness Construct Score by Subject Matter Expert in Evaluation Form……..100

Table 6.13 Satisfactory Scale for Assessment and Evaluation Construct Score by Subject Matter Expert in Evaluation Form……..……101

UNIVERSITI TEKNIKAL MALAYSIA MELAKA

Table 6.14 Satisfactory Scale for Integrity, Coherence and Connectivity Construct Score by Subject Matter Expert in Evaluation Form…….102

Table 6.15 Satisfactory Scale for Teaching Material Construct Score by Students in Evaluation Form…….103

Table 6.16 Satisfactory Scale for Learning Exercise Construct Score by Students in Evaluation Form…….104

Table 6.17 Satisfactory Scale for Interface Construct Score by Students in Evaluation Form…….105

Table 6.18 Satisfactory Scale for Interface Construct Score by Students in Evaluation Form…….106

Table 6.19 Satisfactory Scale for Practicality Construct Score by Students in Evaluation Form…….107

Table 6.20 The Total Mean for IT Expert Evaluation Form……..113

Table 6.21 The Total Mean for Subject Material Expert Evaluation Form …..113

Table 6.22 The Total Mean for Students Evaluation Form ……..……...114

UNIVERSITI TEKNIKAL MALAYSIA MELAKA

LIST OF FIGURES

PAGE

Figure 2.1 CompEdu Main Interface (Vitali Fedulov (2005))…….6

Figure 2.2 Opinion on improvement of learning results when using CompEdu (Vitali Fedulov (2005))……7

Figure 2.3 Design System Diagram (Nichols Hess & Gerr (2016))……..9

Figure 2.4 Practical Skills and Theoretical Knowledge survey results (J.Swacha et al (2010))…….12

Figure 2.5 Meaningfulness level calculated on use of electronic resources (Ali Viranvand & Ali Akbar Khasseh (2014))……14

Figure 2.6 Summary of the non-equivalent group, post-test only design (Bibiana Chiu-Yiong Lim, Llewellyn Wee-Ling Liu & Chian-Hou Choo (2020))……..21

Figure 2.7 Design of the electronic book on electromagnetic radiation (D. Ambarwati, A. Suyatna & C. Ertikanto (2019)……..23

Figure 2.8 The result of the research (M. Zakiyah and F. Fitrawati (2020))……24

Figure 2.9 Media Elements Contents by Didik D. Prasetya & Aji P. Wibawa (2018) ……..……...…….…...26

Figure 2.10 Media Elements Contents by Hessah Alshaya & Ofanan Oyaid (2017)……..26

UNIVERSITI TEKNIKAL MALAYSIA MELAKA

Figure 2.11 Media Elements Contents by Dan Cristea and Stefan-Georghe Pentiuc (2016)……..……..27

Figure 2.12 Figure 2.11 Media Elements Contents by Dan Cristea and Stefan-Georghe Pentiuc (2016) by Bibiana Chiu-Yiong Lim, Llewellyn Wee-Ling Liu & Chian-Hou Choo (2020)……28

Figure 2.13 Media Elements Contents by D. Ambarwati, A. Suyatna & C. Ertikanto (2019)……29

Figure 2.14 Media Elements Contents by Ahmad Harjono, Gunawan Gunawan, Rabiatul Adawiyah & Lovy Herayanti (2020)……30

Figure 2.15 SECTIONS Model……..……38

Figure 3.1 Andrew Rollings and Ernest Adams on Game Design (2003) by Andrew Rollings and Ernest Adams……44

Figure 3.2 The Art of Game Design (2008) by Jesse Schell……44

Figure 3.3 Kotobee Author……...45

Figure 3.4 Kotobee Reader……...46

Figure 3.5 Adobe Photoshop……46

Figure 3.6 iMovie ……..……46

Figure 3.7 Canva ……..……46

Figure 3.8 Giphy……47

Figure 3.9 BookWidgets……47

Figure 3.10 Youtube……..47

Figure 3.11 Hardware Specification……48

Figure 3.12 Gantt Chart……49

UNIVERSITI TEKNIKAL MALAYSIA MELAKA

Figure 4.1 Open .epub file using Kotobee Reader…….53

Figure 4.2 Chapter 1…….54

Figure 4.3 Chapter 1 when video plays……55

Figure 4.4 Navigating to the next page……56

Figure 4.5 Enlarging the Image……56

Figure 4.6 Animation in page will continuously play…….57

Figure 4.7 Review Section at the end of Chapter 1……58

Figure 4.8 Example of questions…….58

Figure 4.9 Submitting the answers…….59

Figure 4.10 Example of correct answers……59

Figure 4.11 Example of incorrect answers……60

Figure 4.12 Settings in Kotobee Reader……60

Figure 4.13 Notebook function in Kotobee Reader……..61

Figure 6.1 Pilot Test…….76

Figure 6.2 Experiment Group and Control Group Differences…….. 77

Figure 6.3 Total Mean Formula……..…77

Figure 6.4 The before and after process of arrangement of the Pre-Test……....80

Figure 6.5 Gender of the IT Expert……..82

UNIVERSITI TEKNIKAL MALAYSIA MELAKA

Figure 6.6 Organization Name of the IT Expert……..82

Figure 6.7 Major Expertise of the IT Expert……..83

Figure 6.8 Experience of the IT Expert…….……..83

Figure 6.9 Application used to open the Interactive Book by the IT Expert……84

Figure 6.10 Gender of the Subject Matter Expert…….85

Figure 6.11 Organization Name of the Subject Matter Expert…….……..…..85

Figure 6.12 Major Expertise of the Subject Matter Expert …….……..…..…..86

Figure 6.13 Experience of the Subject Matter Expert …….……...…..86

Figure 6.14 Application used to open the Interactive Book by …….……..87

Figure 6.15 Gender of the Students……..……88

Figure 6.16 Current Year of Study of the Students……..……..88

Figure 6.17 Grade received for the subject Computer Games Development of the Students……..……..…..89

Figure 6.18 Experience with Interactive Books by the Students……..…..89

Figure 6.19 Application used to open the Interactive Book by the Students…....90

Figure 6.20 Gender of the Test Users……..…….....91

Figure 6.21 Current Year of Study of the Test Users…….……....91

Figure 6.22 Departments of the Test Users…….....92

UNIVERSITI TEKNIKAL MALAYSIA MELAKA

Figure 6.23 Pre-Test Result Before and After Arrangement……...109

Figure 6.24 Post-Test Results for Experiment (E) Group……110

Figure 6.25 Pre - Test and Post-Test Results Comparison for Experiment (E) Group……...110

Figure 6.24 Post-Test Results for Control (C) Group…….……111

Figure 6.25 Pre - Test and Post-Test Results Comparison for Control (C) Group……...111

Figure 6.28 Post-Test Results Comparison for Control (C) Group and Experimental (E) Group…….……...112

Figure 6.29 Comparison of Total Grades for Control Group and Experiment Group……...115

UNIVERSITI TEKNIKAL MALAYSIA MELAKA

LIST OF ABBREVIATIONS

FYP	-	**Final Year Project**
UTEM	-	**Universiti Teknikal Malaysia Melaka**

UNIVERSITI TEKNIKAL MALAYSIA MELAKA

LIST OF ATTACHMENTS

		PAGE
Appendix A	**Questionnaire for Data Collection**	**121 - 125**
Appendix B	**Test Questions**	**126 – 134**
Appendix C	**Storyboard Designs**	**135 - 151**
Appendix D	**Evaluation Form for IT Expert**	**152 - 156**
Appendix E	**Evaluation Form for Subject Matter Expert**	**157 - 161**
Appendix F	**Evaluation Form for Students**	**162 - 166**
Appendix G	**Pre -Test and Post – Test Questions Form**	**167 - 170**

UNIVERSITI TEKNIKAL MALAYSIA MELAKA