EDUCATIONAL GAME BASED LEARNING: LEARN AT HOME

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EDUCATIONAL GAME BASED LEARNING: "LEARN AT HOME"

FAKHRUR RADZIQ BIN MOHAMAD FORZAN

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

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FACULTY OF INFORMATION AND COMMUNICATION TECHNOLOGY
UNIVERSITI TEKNIKAL MALAYSIA MELAKA

2020/2021

DECLARATION

I hereby declare that this project report entitled

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

STUDENT : FAKHRUR RADZIQ BIN MOHAMAD FORZAN Date : 2 / 9 / 2021

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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 (Game Technology)] with Honours.

SUPERVISOR : TS. DR. IBRAHIM BIN AHMAD Date : 4 September 2021

DEDICATION

Alhamdulillah, all praises to Allah.

I dedicate my dissertation work to my family and many friends. A special feeling of gratitude to my loving parents, whose words of encouragement and push for tenacity ring in my ears.

I also dedicate this dissertation to my many friends who have supported me throughout the process. I will always appreciate all they have done.

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ABSTRACT

This project implements a game-based learning system to boost student self-efficacy in the classroom. This simple game aimed to capture the attention and interest of primary students in order to enable students to better integrate themselves into activities of cooperative learning in academic course, for reach their motivation of self – learning and further improve their learning effectiveness. Course digitization has become more prevalent as technology has advanced, and there are a number of computer games available. Furthermore, as computers and the Internet have grown in popularity, researchers have begun to look into the GBL of computer platforms. GBL can improve students' learning motivation more than standard teaching tactics, and teachers can assist students learn and acquire new knowledge in games by establishing activities that blend course content with games.

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ABSTRAK

Projek ini melaksanakan sistem pembelajaran berasaskan permainan untuk meningkatkan keberkesanan diri pelajar di dalam bilik darjah. Permainan mudah ini bertujuan untuk menarik perhatian dan minat pelajar-pelajar sekolah rendah untuk membolehkan pelajar untuk mengintegrasikan diri mereka dengan lebih baik ke dalam aktiviti-aktiviti pembelajaran koperasi dalam kursus akademik, untuk mencapai motivasi diri mereka - belajar dan meningkatkan lagi keberkesanan pembelajaran mereka. Pendigitalan kursus telah menjadi lebih lazim kerana teknologi telah maju, dan terdapat beberapa permainan komputer yang tersedia. Tambahan pula, apabila komputer dan Internet telah berkembang popular, penyelidik telah mula melihat ke dalam GBL platform komputer. GBL boleh meningkatkan motivasi pembelajaran pelajar lebih daripada taktik pengajaran standard, dan guru boleh membantu pelajar belajar dan memperoleh pengetahuan baru dalam permainan dengan mewujudkan aktiviti yang menggabungkan kandungan kursus dengan permainan.

UNIVERSITI TEKNIKAL MALAYSIA MELAKA

TABLE OF CONTENTS

PAGE

DECLARATION ..... **II**

DEDICATION ..... **III**

ACKNOWLEDGEMENTS ..... **IV**

ABSTRACT ..... **V**

ABSTRAK ..... **VI**

TABLE OF CONTENTS ..... **VII**

LIST OF TABLES ..... **XI**

LIST OF FIGURES ..... **XII**

LIST OF ABBREVIATIONS ..... **XIII**

LIST OF ATTACHMENTS ..... **XIV**

CHAPTER 1: INTRODUCTION **1**

1.1 Project Background 1

1.2 Problem Statement 1

1.3 Objectives 1

1.4 Scope 2

1.5 Conclusion 2

UNIVERSITI TEKNIKAL MALAYSIA MELAKA

CHAPTER 2: LITERATURE REVIEW AND PROJECT METHODOLOGY . 3

2.1 Introduction 3

2.2 Genre 3

2.3 Existing Games 4

2.3.1 Comparison of Existing Games 6

2.4 Project Methodology 6

2.5 Conclusion 7

CHAPTER 3: ANALYSIS 9

3.1 Current Scenario Analysis 9

3.2 Requirement Analysis 9

3.2.1 Software Requirement 10

3.2.2 Hardware Requirement 10

3.3 Project Schedule and Milestone 10

3.4 Conclusion 13

CHAPTER 4: DESIGN 14

4.1 Introduction 14

4.2 Game Architecture 14

4.3 Game Design 15

4.3.1 Gameplay 15

4.3.2 Core Mechanics 16

4.3.3 Flowboard 16

4.4 Game Art 17

4.4.1 Game World 18

4.4.2 Audio/Sound Effect 18

UNIVERSITI TEKNIKAL MALAYSIA MELAKA

4.5 Conclusion 18

CHAPTER 5: IMPLEMENTATION 20

5.1 Introduction 20

5.2 Creation of Game Art 20

5.3 Integration of Game Components 22

5.4 Game Configuration Management 23

5.5 Implementation Status 23

5.6 Conclusion 24

CHAPTER 6: TESTING AND EVALUATION 25

6.1 Introduction 25

6.2 Test Plan 25

6.2.1 Test User 25

6.2.2 Game Feature 26

6.3 Test Implementation 26

6.3.1 Test Description 26

6.4 Test Result and Analysis 29

6.4.1 Introduction 29

6.4.2 Demographics 30

6.4.3 Usability/Playtesting 33

6.4.4 User Experience 34

6.4.5 Learning Motivation/Knowledge Improvement 34

6.4.6 Respondents Suggestions 35

6.5 Conclusion 35

CHAPTER 7: CONCLUSION 36

UNIVERSITI TEKNIKAL MALAYSIA MELAKA

7.1 Introduction 36

7.2 Project Summarization 36

7.3 Contribution 36

7.4 Conclusion 37

REFERENCES 38

APPENDIX 39

UNIVERSITI TEKNIKAL MALAYSIA MELAKA

LIST OF TABLES

	PAGE
Table 2.1: Comparison of Existing Game……...	**6**
Table 3.1: Gantt Chart for Project Development……...	**11**
Table 3.2: Milestone for Project Development……...	**12**
Table 6.1: Scoring for Evaluation Test……...	**27**
Table 6.2: Demographics Factors……...	**27**
Table 6.3: Usability/Playtesting Factors……	**28**
Table 6.4: User Experience Factors……	**28**
Table 6.5: Knowledge Improvement Factors……	**29**
Table 6.1: Usability/Playtesting Mean and Standard Deviation……..	**33**
Table 6.2: User Experience Mean and Standard Deviation……..	**34**
Table 6.3: Knowledge Improvement Mean and Standard Deviation……...	**34**

UNIVERSITI TEKNIKAL MALAYSIA MELAKA

LIST OF FIGURES

	PAGE
Figure 2.1: Fox's Tale……	**4**
Figure 2.2: Fox's Tale Level 1……...	**4**
Figure 2.3: Platformer 2D……	**5**
Figure 2.4: Platformer 2d Playthrough……...	**5**
Figure 2.5: Game Development Life Cycle……..	**7**
Figure 3.1: Flowchart of Fox's Tale……..	**9**
Figure 3.2: Flowchart of Platformer 2D……..	**10**
Figure 4.1: Game Architecture Diagram……	**14**
Figure 4.2: Hierarchy of Game……..	**15**
Figure 4.3: Flow board of Game……...	**16**
Figure 4.4: Game Art Design……	**17 - 18**
Figure 5.1: Creation of Game Art……	**21 – 22**
Figure 5.6: Process of Game Creation……..	**23**
Figure 5.7: Implementation Status Project……..	**24**
Figure 6.1: Pie Chart Data……	**30 - 32**

UNIVERSITI TEKNIKAL MALAYSIA MELAKA

LIST OF ABBREVIATIONS

FYP	**-**	**Final Year Project**
GUESS	**-**	**Game User Experience Satisfaction Scale**
GBL	**-**	**Game – Based Learning**
ODL	**-**	**Online Distance Learning**

UNIVERSITI TEKNIKAL MALAYSIA MELAKA

LIST OF ATTACHMENTS

		PAGE
Appendix A	**Questionnaire**	**39**
Appendix B	**Coding Script**	**43**

UNIVERSITI TEKNIKAL MALAYSIA MELAKA

CHAPTER 1: INTRODUCTION

1.1 Project Background

This project is a 2D platform game or side – scrolling genre, and potentially can be one of game – based learning, where the target user is primary school children. The purpose of this game is to helps every student who has faced difficulty in Online Distance Learning (ODL) classes, during this pandemic that totally takes over the world. Game – based learning can be a part of curriculum activity in school, in order to engage the student to learn more about a subject, thoroughly by playing this game. The syllabus of basic subjects which is English and Mathematics will be covered and included in this project.

1.2 Problem Statement

Being physically present in a classroom is not the only learning option anymore – not with the rise of the internet and new technologies, at least. Nowadays, as long a student has access to a computer, then they can access a quality education whenever and whatever they want. We are now entering new era – the revolution of online education. My project focuses on trying to attract the students who has faced difficulty in ODL classes during this pandemic.

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1.3 Objectives

i. To identify the elements and requirements of game-based learning development.
ii. To develop player ability on how to interact with game based – learning.
iii. To evaluate player feedback on overall experience from the game.

1.4 Scope

This project is targeting on children between 7 to 12 years old where mostly children around this age already exposed to online learning techniques and can easily interact to teachers, as long their parents keep alongside them. Furthermore, this project also focused on children because the aim of this project is to know whether the target audience are suitable with simple 2D platform game or not.

1.5 Conclusion

As conclusion for this chapter, it describes the overall idea of this project. It stated that this project will developing a simple 2D platform game that potentially become one of attraction for people nowadays not even in gaming but as well as in education and medical education and others. According to the most recent survey from Babson Survey Research Group, over 30 percent of higher education students in United States are taking at least one distance course. This shows that education is sensible choice whether a teenager or an adult. As a student, this can be useful learning method for sharpening the skills in a difficult subject, or learning a new skill.

Therefore, in the next chapter will be the elaboration about the methodology of the project would be explain as well as the process of project development.

UNIVERSITI TEKNIKAL MALAYSIA MELAKA

CHAPTER 2: LITERATURE REVIEW AND PROJECT METHODOLOGY

2.1 Introduction

Game-based learning is where game characteristics and principles are embedded within learning activities. Components of game-based learning include system points, badges, leaderboards, discussion boards, quizzes and classroom response system. Badges can be given to students if they reach certain success level. Game-based learning also an active learning technique where games are used to enhance student learning. It can be accomplished with digital or non-digital games and may include simulations that can allow students to experience the learning method.

2.2 Genre

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The game genre for this project is 2D platform game which elements of game-based learning will be applied. Player able to move left and right, run, jump and crouch in the entire game. At first, player must face the enemies which consist of eagle, frog and opossum, then player able to answer like trivia quiz that become additional challenges for characters.

2.3 Existing Games

(a) Fox's Tale

Figure 2.1: FOX'S TALE
(Source: https://yukichen.itch.io/2d-platformer)

Fox's Tale (as in Figure 2.1) is a 2D platformer game created by game indie developer, Yuki Chen. The game is made by Unity. It is about a fox that lost in deep forest, that need to find a way out from there. In the journey, the fox needs to avoid from the enemies which consist of frog, opossum and eagle. Fox need to collect gems as many as possible in order to proceed to next level that need to unlock the door. Player guide the fox through colorful levels, avoiding enemies and jumping over different obstacles.

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Figure 2.2 Level 1
(Source: https://yukichen.itch.io/2d-platformer)

As shown in Figure 2.2, player control the fox and need to destroy opossum by jumping on the body. If player fail to work on that, the life count (heart icon) will be depleted. If there is no life left, player will restart the game as where the nearest checkpoint close to player.

(b) Platformer 2D

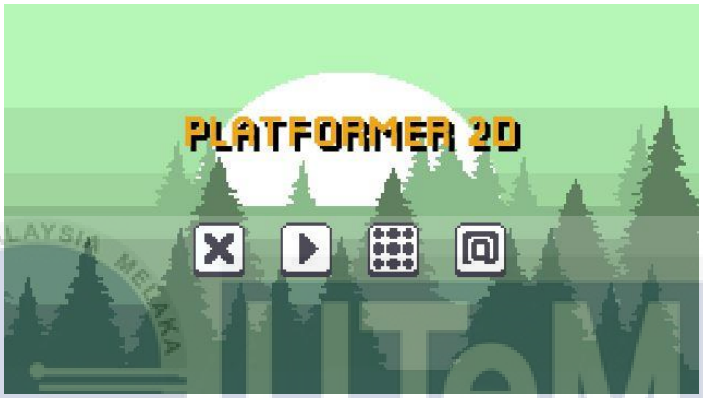

Figure 2.3: PLATFORMER 2D
(Source: https://yusastudios.itch.io/platformer-2d)

This game is a challenging 2D platformer game that created by Yusa Studios, using Godot Engine for PC based. Player will control character look like spaceman and make progress through the portal that can proceed to next level. The only game mechanic in this game is only jump and need to avoid from obstacles that consist of spikes ball and traps.

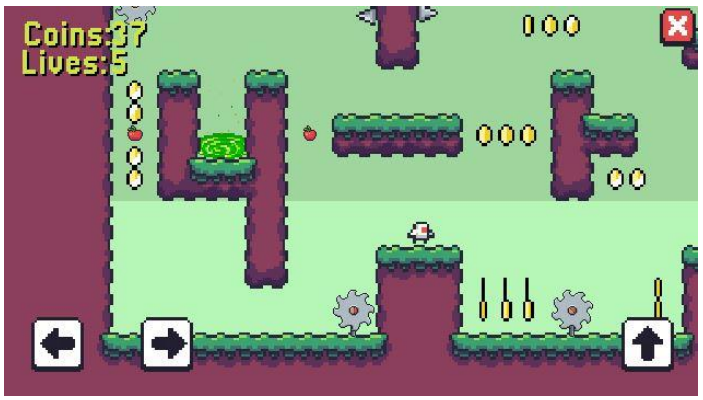

Figure 2.4 Playthrough
(Source: https://yusastudios.itch.io/platformer-2d)

In this scene (Figure 2.4), it shows that player need to collect coins and apple that can refill the health to surpass the level, the green portal.

2.3.1 Comparison of Existing Games

	Fox's Tale	Platformer 2D
Gameplay	Player collect coins and gem as a rule to proceed next level.	Player adventure through the levels and challenges,
Game Mechanic	Key A and D to move left and right, space to jump and destroy enemies.	Arrow keys to move left and right. Avoid obstacles and get enter green portal to get through next level.
Platform	HTML5 support browser with a physical keyboard.	Windows compatible.
Duration	3 – 5 minutes	3 – 10 minutes

Table 2.1: Comparison of Existing Game

Table 2.3.1 shows the comparison of existing game between Fox's Tale and Platformer 2D game, in terms of gameplay, game mechanic, platform used and duration time of playing for the game. Main difference for these two games is how the player react and proceed to next level, by collecting coins or entering portals. Additionally, the game level is arranged in manner and let player meet obstacle first, then player will meet enemies that cause chaos to player to reach the goal.

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2.4 Project Methodology

The methodology used in this project is Game Development Life Cycle (GDLC). This life cycle has eased the developer to deliver a good quality game according to criteria at each of the phase.

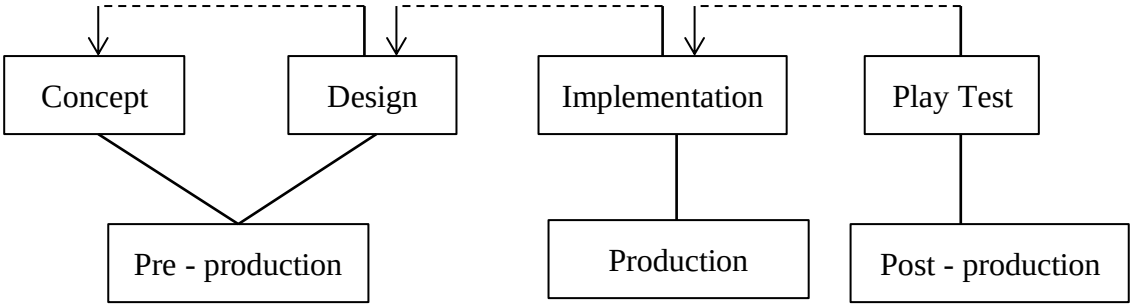

Figure 2.5: Game Development Life Cycle

- Phase One: concept development

  For the beginning, I search for idea and how the project will look like. Having discussion with superior is most important at this phase because I need more knowledge about game development.

- Phase Two: Design

  In this phase, I start to sketches and design all the characters, environments and menus for the game. Plus, I try to compose all the music and sound effect for the gameplay and main menu. I am using Blender to create 3D asset.

- Phase Three: Production

  In this phase, I start to develop the game based on our sketches and designs by compiling all assets in Unity.

- Phase Four: Evaluation/Test Play

  After finished all the phase above, it's time to test the game. I need to fix all the bug and error so that we can counter during test play before it can be presented.

2.5 Conclusion

As conclusion, this chapter discusses about comparison of existing game that available in industry, developed by group of indie developers. Other than that, methodology also mention in this chapter by using GDLC.

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In next chapter will discuss about elaboration more details about data analysis and the flow chart and story board of the game.

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