

THINK SAFE: A ROAD SAFETY AWARENESS THROUGH 3D ROLE
PLAYING GAME



UNIVERSITI TEKNIKAL MALAYSIA MELAKA

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THINK SAFE: A ROAD SAFETY AWARENESS THROUGH 3D ROLE
PLAYING GAME

MOHD NAJIB BIN ABD HALIM



This report is submitted in partial fulfilment of the requirements for the Bachelor
of Information Technology (Game Technology) With Honours.

FACULTY OF INFORMATION AND COMMUNICATION TECHNOLOGY
UNIVERSITI TEKNIKAL MALAYSIA MELAKA

2021

DECLARATION

I hereby declare that this project entitled
**THINK SAFE: A ROAD SAFETY AWARENESS THROUGH 3D ROLE
PLAYING GAME**
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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
Information Technology (Game Technology) with Honours.

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DEDICATION

Praise to Almighty Allah S.W.T

To my supervisor, Ts. Dr. Muhammad Haziq Lim Bin Abdullah who always giving so much motivation and attention in term of guiding me throughout the project development process and report writing

To my beloved parents, wife and son, thank you for understanding and great support of encouragement and motivation through the time

Finally, not to forget to Universiti Teknikal Malaysia Melaka that giving such a great opportunity for me to enhance my skills and resources to make this project possible

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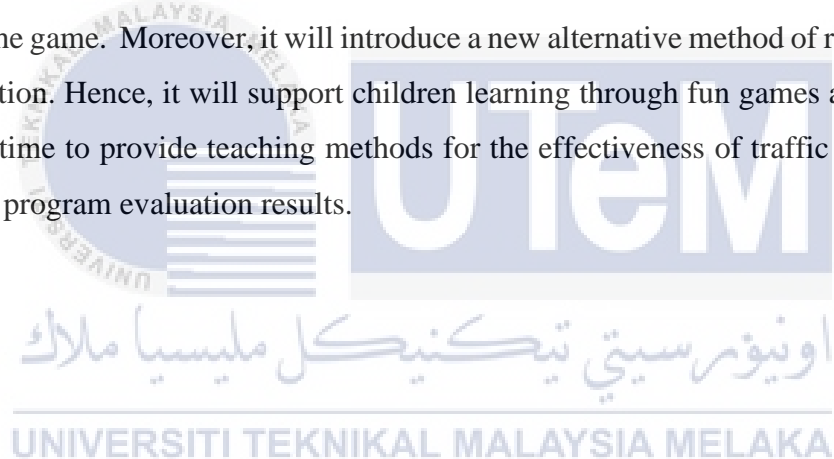
Furthermore, a huge appreciation to my beloved parents, wife and son for understanding and great support when come to words of encouragement and motivation through the tough time.

Finally, not to forget to Universiti Teknikal Malaysia Melaka that giving such a great opportunity for me to enhance my skills and resources to make this project possible.

ABSTRACT

This project was focusing on the development of the Role-Playing Game genre that are inspired from Road Safety Awareness program conducted by related authorities in road safety in purposes as alternative way to teach people especially children about road safety through video game. This project starts with finding problem that relevant to game development. The problem is the children with basic of road safety without experience of scenario on the road is unsuitable for being safe in the road, road safety awareness approach is still not effective because children not able to gain useful knowledge and children still get negative effects because some approaching method maybe not reach to the expectations and can be harmful for them if it makes a false sense of safety and overconfident. Furthermore, schools with road safety learning programme still use a traditional way (say and write) without hands on method and suitable timing, there are young people are not interested with so much theoretical learning and there are still insufficient of materials provided to family and teachers in order to teach students. In fact, children may search a right road safety awareness program outside by using web-based application, but it is still differed with road rules and environment in Malaysia if children want to use the application as medium for learning road safety. This project aims to determine the improvement of knowledge about traffic rules and conditions after children play, to introduce a new alternative road safety teaching method, to transfer knowledge about road safety to children aged seven to twelve years old, to analyse the factors that can influence learning through playful learning and presents a new alternative

teaching method for road safety education. The project uses the Game Development Life Cycle model as a methodology that consists of four phases such as start-up phase, pre-production phase, production phase and testing phase before turning into a gold master release. Through a literature review, developer found four findings which are 3D RPG game can visualize virtual environment to trigger players reaction, the game design can be effectiveness tool for children learning, the game approach can improve road safety awareness advocation and the game can trigger behaviours and experience of learning. In conclusion this game was developed to approach younger generation with a new way to learn the road safety rules, code of conduct and safely practise in virtual mode as well as become support system of current children road safety awareness learning program especially for children. The significance of this project is aimed to teach children about traffic safety, realize their familiarity with road rules and conditions after play the game. Moreover, it will introduce a new alternative method of road safety education. Hence, it will support children learning through fun games and on the same time to provide teaching methods for the effectiveness of traffic education in the program evaluation results.



ABSTRAK

Projek ini bertumpukan kepada pembangunan permainan video dalam bentuk RPG yang diinspirasikan dari program Kesedaran Keselamatan Jalan Raya yang telah diaturkan oleh pihak berkuasa keselamatan jalan bertujuan sebagai jalan alternatif untuk mendidik orang ramai terutama kanak – kanak menerusi permainan video. Projek ini bermula dengan pencarian isu yang berkaitan dengan pembangunan permainan ini. Isunya ialah kanak-kanak dengan asas keselamatan jalan raya tanpa pengalaman berhadapan senario di jalan raya adalah tidak sesuai dan selamat semasa berada di jalan raya, pendekatan kesedaran keselamatan jalan raya masih tidak berkesan kerana kanak-kanak kurang memperoleh pengetahuan yang berguna dan kanak-kanak masih mendapat kesan negatif kerana beberapa kaedah pendekatan mungkin tidak menepati jangkaan dan boleh memudaratkan mereka sekiranya mempunyai kesedaran keselamatan dan keyakinan diri yang salah. Tambahan pula, program pembelajaran keselamatan jalan raya di sekolah masih menggunakan cara tradisional (lisan dan tulis) tanpa kaedah dan masa yang sesuai, kanak – kanak dan juga orang muda tidak berminat dengan pembelajaran teori yang begitu banyak dan masih tiada bahan yang mencukupi untuk ibu bapa dan guru untuk mengajar pelajar berkaitan keselamatan jalan raya. Sebenarnya, kanak-kanak mungkin mencari program kesedaran keselamatan jalan raya yang betul di luar dengan menggunakan aplikasi berasaskan web, tetapi masih berbeza dengan peraturan jalan raya dan persekitaran di Malaysia jika anak-anak ingin menggunakan aplikasi tersebut sebagai media untuk mempelajari keselamatan jalan raya. Projek ini bertujuan untuk meningkatkan pengetahuan mengenai

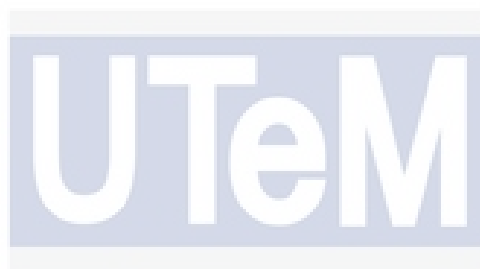
peraturan dan keadaan lalu lintas kepada kanak-kanak selepas bermain, memperkenalkan kaedah alternatif yang baru bagi pembelajaran keselamatan jalan raya, mendedahkan pengetahuan mengenai keselamatan jalan raya kepada kanak-kanak berumur tujuh hingga dua belas tahun, menganalisis faktor-faktor yang dapat mempengaruhi pembelajaran melalui pengalaman bermain dan menyampaikan kaedah pengajaran alternatif yang baru untuk pendidikan keselamatan jalan raya. Projek ini menggunakan model Kitaran Hayat Pembangunan Permainan sebagai metodologi yang terdiri daripada empat fasa seperti fasa permulaan, fasa pra-produksi, fasa pengeluaran dan fasa pengujian sebelum bertukar menjadi produk akhir. Melalui ulasan literatur, pembangun mendapat empat penemuan iaitu permainan 3D RPG dapat memvisualisasikan persekitaran maya untuk mencetuskan reaksi pemain, reka bentuk permainan dapat menjadi alat keberkesanan untuk pembelajaran anak-anak, pendekatan permainan dapat meningkatkan advokasi kesedaran keselamatan jalan raya dan permainan dapat mencetuskan tingkah laku dan pengalaman belajar. Kesimpulannya, permainan video ini dibangunkan untuk mendekati generasi muda dengan cara yang baru dalam mempelajari peraturan keselamatan jalan raya, kod aturan dan praktis selamat dalam mod virtual serta menjadi sistem sokongan kepada program pendidikan kesedaran keselamatan jalan raya yang sedia ada khususnya kepada kanak – kanak. Kepentingan projek ini adalah bertujuan untuk mengajar kanak-kanak mengenai keselamatan lalu lintas, menyedarkan mereka dengan membiasakan peraturan dan keadaan jalan raya setelah bermain dengan permainan ini. Selain itu, ia juga dapat memperkenalkan kaedah alternatif baru dalam pendidikan keselamatan jalan raya. Oleh itu, ia dapat menyokong pembelajaran kanak-kanak melalui permainan yang menyeronokkan dan pada masa yang sama menyediakan kaedah pengajaran untuk menilai keberkesanan program pendidikan lalu lintas.

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LIST OF ABBREVIATIONS



RPG	Role Playing Game
JKJR	Jabatan Keselamatan Jalan Raya
MIROS	Malaysian Institute of Road Institute
KPM	Kementerian Pelajaran Malaysia
UI	User Interface
GUI	Graphical User Interface
GDLC	Game Development Life Cycle
NPC	Non-Playable Character
VFX	Visual Effects

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CHAPTER I

INTRODUCTION



1.1 Project Background

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Road Safety Awareness campaign has been held several years in Malaysia. In search of program effectiveness instead of criticism for road safety awareness program delivering system, this will open a new chance to develop a 3D RPG interactive game to ensure the road safety awareness program is relevant for now. This game projects combines role-playing game (RPG) genre in game-based learning. This project is purposes to create road safety awareness to communities especially children because it is suitable interactive media to learn road awareness and traffic rules. Plus, it will clearly show road surroundings and able to help them familiarize with the surroundings. Although road safety awareness application or game is existing and can be played by anyone still it has a constraint and different environment. Hence, this project can be a catalyst for road safety awareness program enhancement in Malaysia.

1.2 Problem Statement

Road Safety Awareness is a campaign for people to understand about road safety. Every country including Malaysia has implemented this campaign in such way like forum, seminars, training and get a support from public & private sector to organize it. Despite of all effort and approach to make road safety awareness program reach at target people especially for children, there are still have constraints and issues on it. There has a factor why this project is dedicated to this age group, kids with a basic of road safety without experience of scenario on the road is unsuitable for being safe in the road. Moreover, road safety awareness approach is still not effective because children not able to gain useful knowledge without stimulation and motivation. Hence, children still get negative effects because some approaching method maybe not reach to the expectations and can be harmful for them if it makes a false sense of safety and overconfident. In fact, schools with road safety learning programme still use a traditional way (say and write) without hands on method and suitable timing. In addition, there are young people are not interested with so much theoretical learning and there are still insufficient of materials provided to family and teachers in order to teach students. In another way, children may search a right road safety awareness program outside by using web-based application, but it is still differed with road rules and environment in Malaysia if children want to use the application as medium for learning road safety.

1.3 Objectives

The main objectives of this project are:

- i. To investigate the game elements of 3D role playing for Road Safety Awareness.
- ii. To develop 3D role playing game based on identified elements.
- iii. To evaluate children awareness towards road safety through 3D role playing game.

1.4 Scope

The game development is more on educational game oriented. So, it needed to focus on children group target age between 7 to 10 years old. The platform suggestion of this project is through Web (online) and PC Windows. This is because it widely uses, easy installation and flexibility. It also used as a testing environment for collecting data for qualitative and quantitative analysis. For game genre, it will focus on how RPG game design can blend together with game-based learning and create interaction.

1.5 Project Significance

The project is aimed to teach children about traffic safety, realize their familiarity with road rules and conditions after play the game. Moreover, it will introduce a new alternative method of road safety education. Hence, it will support children learning through fun games and on the same time to provide teaching methods for the effectiveness of traffic education in the program evaluation results. In addition, it will create stimulating environment through social stories and digital stories to educate children about road safety awareness. Therefore, the aim is to assist primary school students in learning and teaching methods and implement transportation education. Besides that, it also to evaluate the main characteristics of traffic training evaluation plan, the impact criteria used and the characteristics of the potentially effective programme. Moreover, it can help developer to analyse the factors that affect learning through play learning in game, and to investigate whether first-person game interactions are more immersive than third-person games to be implemented in this 3D RPG game.

Therefore, the expected results of this project are to achieve all game development goals which is to investigate the game elements of 3D role playing for road safety awareness. Moreover, it will develop 3D role playing game based on identified elements. Besides that, it will evaluate children awareness towards road safety through 3D role playing game.

Overall, this project is expecting to help people especially children adapt virtual road environment and road scenario in their real life. Hence, children have ability to explore, learn and decide what the right action and teach them to obey the traffic rules and regulation. In addition, it will help and enhance road safety awareness program in Malaysia with effective solution to ensure the program still relevant to run. Besides that, it will show an ability of RPG game genre collaborate with game-based learning especially in road safety awareness and how this collaboration can be a best combination through 3D game development.

1.6 Summary

In the conclusion, overall idea for this project assembles on this chapter. The purposes, target audience and problem are a basic discovery to kick start for next chapter. This is to ensure all idea is in line with the objective of this project. As matter of facts, it will define a learning and play experience factor to suit with the project requirements and at the same time help developer have a deeper understanding of the characteristics and limitations of different teaching strategies.

Therefore, the development of project methodology and the process of project development will be explained in the next chapter.

CHAPTER II

LITERATURE REVIEW & PROJECT METHODOLOGY



2.1 Introduction

This chapter will discuss about past literature related to proposed project. It is a requirement to guide developer design a game based on literature review and get overview about road safety awareness approach, a game design useful in learning and related theories.

2.2 Domain

The domain for this project is 3D Role Playing Game. The design and development of the game would combine 3D RPG Game with learning base element. Hence, the project will indirectly become as a medium to deliver awareness of road safety. Serious game in 3D RPG game have possibility to create as if virtual environment without need to assist player in real situation. In fact, the game with AI driven would enhance traffic situation in order to immerse player based on road situation in real life.

RPG game genre widely become popular genre today. This game genre shows behavioural shape regarding to characteristics of the game character. While the character is a person, it can be followed by children in positive aspect without destroy the fun. As mentioned before in article written by Vinogradovaa and Ivanova (2016), when design and develop RPG game for children, a plots and contents is fixed and only can change the characteristic by recurrence plots.

By using the literature review, a developer found four (4) findings which are:

i. 3D RPG game can visualize virtual environment to trigger players reaction.

A 3D Role Playing Game (RPG) game-based learning is one of the alternative ways to visualize real scenario without compromise on safety. M. Ariffin et al (2004) stated that simulating virtual environment scene can be benefited in terms of reducing risk and cost rather than conducting in real situation. In addition, game have ability to visualise player in realistic environment and trigger reaction when some scenario on the road is happen (Herold et al, 2019). Hence, a game should be typical, varied, broad in knowledge, and able to reflect the cultural characteristics of the times. (Wang et al, 2019).

As matter of facts, a character in 3D RPG game is to visualise children itself. Dennisova and Cairns (2018) stated that game with third-person perspective allows players to watch the actions of the protagonist without making the player feel that they are really a character. For example, characters in the games must meet the needs of educational goals, convey certain educational information, and serve the goals. (Wang et al, 2019). Moreover, it is being stated the characters in the game must meet the cognitive level of the learner in order to be accepted and loved by the learner. Therefore, it is important to allow player discover open world in virtual environment game without to practise on real environment. Hence, the characters visualise inside this game project can shaping a nature of children itself to be disciplined and always careful when they are on the road.

ii. 3D RPG game design can effectiveness tool for children learning

A 3D RPG game with learning based preferably designed with a right gamification concept can be effectiveness for children learning. Wang et. al