Final Report for
A Role-Playing Game for Learning Moral Values

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Abstract

With the development of technology, educational games have become popular and crucial in modern education. They help to motivate students and increase their concentration and engagement in class. The team has realized the great potential of educational games and the fact that the number of moral educational games is few. This gives the incentive and interest to the team to start this project. The team has done some research on theories and the current trend of the educational gaming industry. The story of the game has been finalized. Modeling, game settings, and the implementation of game logics are finished. The purpose of this project is to develop a moral educational game that teach the children some moral values.

Acknowledgement

The team sincerely thanks the supervisor Dr. T. W. Chim for the guidance and supports in this project.
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1. Introduction

This section includes four parts: motivation, objective, target audience and the scope of work. In the first part, the team covers the information of the educational gaming industry and VR technology which give the motivation to the project. In the second part, the importance of moral values that introduces the objective is included. In the third part, the team shows the underlying reason of the chosen target audience. In the last part, the team illustrates the content of the project.
1.1 Motivation

Serious games are games that are designed for training and education. The number of serious games has increased steadily since 2008 [7]. The executive director of the Serious Games Association, Sue Bohle [2], commented that the revenue of serious games was increasing on a five-year compound annual growth rate of around 20% globally and that of the industry was expected to be more than double by 2022. According to the results of the systematic mapping study done by Vargas [1] on serious games quality, around 60% of serious games belongs to the educational sector. Educational games become more popular and has a great potential. However, most educational games focus on the knowledge of subjects. For instance, vocabularies in English, formulae in Mathematics, and historical facts in History. The number of educational games that relates to moral values is insignificant.

Virtual Reality (VR) is an experience of being involved in a simulated environment. With the use of VR headsets or multi-projected environments, current VR technology can simulate users’ physical movements like turning their heads around and shaking their hands and generate sounds and images accordingly. This technology is used widely in different industries like gaming and medical. This is due to the fact that with the appropriate hardware, users can immerse themselves in a virtual environment that reacts to some of their physical actions. They will be more focus and engaged in working, learning, or playing in such environment. Engagement is the key to facilitate learning. The use of VR technology in education is believed to catalyze the learning process.

These facts give the interest and incentive to the team to develop a 3D role-playing game to help the children to learn moral values.
1.2 Objective

Moral values are vital to everyone as they are the principles that guide us to behave and make decisions throughout our lives. Developing moral values brings us advantages, including building up good personal and professional relationships, dealing with challenges in life, and motivating ourselves and others. Moral values are as critical as knowledges to one’s development.

This project is developing using Unity, which is a cross-platform game engine, with the objective of teaching the children some moral values.

1.3 Target Audience

This project targets at the children. Developing moral values from a young age is more effective because their values of life are usually not shaped and are often highly moldable.

1.4 Scope of Work

This project develops a role-playing game that runs on the Personal Computer (PC) client. The game is avatar-based with the theme of respect, politeness, honesty, kindness and perseverance. It is about an animal racing challenge and contains five scenes. Scene one is the menu scene with two buttons, “Play” and “Quit”. Scene two is for character selection where players can choose the animal they would like to be. Scene three is a tutorial which teaches players how to control the character. In scene four, players can talk to different non-player characters to know the background of the racing challenge. The last scene is the racing part where players need to finish the race within a time period. The details of the methodology will be discussed in the section 3.
The document is organized as follows.

Section 2 covers the background of the project which includes theories studied, previous educational games evaluated and the current trend of the educational gaming industry. Section 3 is about the methodology which introduces the story, aesthetics, technology, scenes, game settings, and mechanics of the project.

Section 4 presents the results in the area of game design, mesh building, dialogue system, character controls and game area decoration. Section 5 illustrates the difficulties encountered. Section 6 includes the future works of the project and this document closes with a conclusion.
2. **Background**

This section includes three parts: theories, previous work and the current trend of the industry. In the first part, the team mentions the Flow Theory and Experiential Learning Theory. In the second part, the team includes some previous educational games. In the third part, the current trend of the educational gaming industry is introduced.

2.1 **The Flow Theory and Experiential Learning Theory**

The Flow Theory, named by Mihály Csíkszentmihályi in 1975, describes the mental state of a person being involved in an activity. According to Csíkszentmihályi, an experience of flow is enclosed by six aspects which can be dependent or independent of each other [3]. Designing and building a game based on the Flow Theory could create an environment that changes one’s subjective experience of time which is one of the six aspects. For example, majestic and realistic or elementary sceneries with warm colors can comfort the players and draw their attentions. This helps them to immerse themselves to the game environment. These environments could help players to concentrate and engage in the game.
Experiential Learning Theory, proposed by David Kolb, focuses on the learning process of an individual through experiences which covers many factors like cognitions and emotions. In Kolb’s experiential learning model (Figure 1), Kolb suggested that one can grab experiences from concrete experience and abstract conceptualization. He also pointed out that reflective observation and active experimentation are the ways of transforming the experience [4].

This 3D role-playing educational game will be designed based on the features of the Flow Theory and Experiential Learning Theory so that players can learn through experiences effectively and efficiently.
2.2 Previous educational games in teaching

Educational games need to be designed in a way that integrates with learners’ engagement.

Get Water! (Figure 2) is a 2D endless runner mobile gaming application developed by Decode Global Studio and released in 2013. This game is about the scarcity of water in India and how does it influence children’s education. Players can control the character, Maya, to collect water for her family so that Maya can go back to school and learn. The game conveys the message that we need to treasure not only water but also the stable learning environment. Moreover, endless runner games are usually addictive as players would like to pursue a higher score. This provides engagement.
WolfQuest [5] is a 3D role-playing wildlife simulation video game developed by the Minnesota Zoo and Eduweb. It is released in 2007. This game aims to help players to study the wolf ecology and understand the role that wolves play in nature. The scenes and graphics (Figure 3) are realistic which may increase players’ engagement.

The proposed 3D moral educational game will be developed to run on the PC client and the details will be described in section 3.

Figure 3. Screenshot of the gameplay of WolfQuest.
Retrieved from https://www.wolfquest.org/game_info.php
2.3 Current trend of the industry

The popularity of educational games has risen in recent years. They have been useful and successful teaching tools in many subjects and courses. For example, 97% [6] of teachers polled reflected that their students were motivated to read more by the gamified reading platform Whooo’s Reading. 70% [6] of teachers perceived that educational video games increased students’ engagement. These data may indicate that teachers are satisfied with the positive impacts of educational games and are willing to use them as a teaching tool.

Although educational games prevail, the number of educational games for delivering moral values is insufficient.
3. **Methodology**

This section includes six parts: story, aesthetics, technology, scenes, game settings, and mechanics.

### 3.1 Story

In the animal village, every animal is required to attend an event named “Virtue Race” in their young age. The event is a challenge with the aim of developing one’s moral values. Players will be one of the animals and are required to finish the race within a period of time in order to win the prize, which is the “Flying Fruit” given by the celestial panda.
3.2 Aesthetics

Low-poly is the art style adopted. Creating low poly assets is easier and faster because texturing may not be required and the number of vertices that need to consider in low-poly models is much smaller than that of realistic models. This can save time and avoid inappropriate scheduling. Moreover, low poly games would not look outdated as they do not focus on looking realistic but showing the contour of objects (Figure 4). The game could be used as a teaching tool in moral education even technology on computer graphics advances.

Figure 4. Screenshot of CARTOON LOW POLY FOREST ISLAND 2.0 BY ANTON MOEK. Retrieved from https://shop.bitgem3d.com/products/cartoon-low-poly-forest-island-2-0-anton-moek
3.3 Technology

Unreal Engine 4 and Unity are the popular game engines in game development. The team uses Unity as the game engine because it has experiences in Unity. In addition, the graphics and lightening of the game are not the priority. The programming language used will be C# as it has better supports and the team has learnt some C# before. For modeling, the team uses Blender as it is free and has many supports and tutorials. Photopea, which is a free, online advanced image editor, is used for making texture and creating sprites.
3.4 Scenes

3.4.1 Menu

The first scene is the menu of the game (Figure 5) which consists of two buttons, “Play” and “Quit”. When the “Play” button is clicked, the scene for selecting character is loaded. When the “Quit” button is clicked, the game is closed.

Figure 5. Screenshot of the menu scene
3.4.2 Character Selection

The second scene of the game is for selecting characters (Figure 6). This scene is loaded when the “Play” button is clicked in the menu scene. In this scene, players can choose the animal they would like to be in the game. There are in total four animals that are available to players, which are bear, deer, rabbit, and golden retriever. Each of them has their own indexes and they are the children of an empty game object named “CharacterList” (Figure 7). The details of these player characters will be introduced in section 3.5.1.
Players can click the “<” or “>” button to change the animal and click the “Confirm” button to confirm their choices. Once the “Confirm” button is clicked, the tutorial scene is loaded and the index of the selected animal is saved to an integer variable in the “PlayerPrefs” with the key of “CharacterSelected” (Figure 8), so that only the selected animal is active in the following scenes.

```
PlayerPrefs.SetInt("CharacterSelected", index);
```

**Figure 8.** Screenshot of the code that set an integer variable with the key of “CharacterSelected”

### 3.4.3 Tutorial

**Figure 9.** Screenshot of the beginning of the tutorial scene
The third scene of the game is a tutorial (Figure 9) that teaches players the basic controls and useful inputs in controlling the player character. It is loaded when players click the “Confirm” button in the character selection scene. Players need to complete some simple tasks instructed and enter a portal subsequently in order to move to the next scene (Figure 10), which is the gathering place of the “Virtue Race”. The details of portal will be mentioned in section 3.5.6.

Figure 10. Screenshot of the portal in the tutorial scene
3.4.4 Gathering Place

This scene is loaded (Figure 11) when players enter the portal in the tutorial scene. Players can talk to different non-player characters to know the information of the “Virtue Race”. Players can get a blessing from one of the non-player characters which is helpful in the race. The “Level1” scene is loaded when players enter the portal somewhere in this scene. The details of blessing and portal will be mentioned in section 3.5.2 and section 3.5.6 respectively.
3.4.5 Level1

This scene is loaded (Figure 12) when players enter the portal in the gathering place scene. This is the first and only scene developed for the “Virtue Race”. There are in total four stages. To pass into the next stage, players need to either find and enter the portal in a stage or find and answer a gatekeeper’s question correctly and enter the portal behind it subsequently. Players need to finish the four stages within a period of time. Players is sent back to the gathering place scene either when they finish the four stages or the time is up. The details of portal will be mentioned in section 3.5.6.
3.5 Game Settings

3.5.1 Virtue Race

The name of the event that every animal is required to attend in their young age. It aims at helping young animals to learn moral values.

3.5.2 Control

The basic controls of the player character are as follows.

WSAD or arrow keys are for the movement direction. Z key is to consume the energy and speed up. F key is to strike up a conversation with a non-player character nearby. X key is to use a kit. The details of energy bar and kit will be mentioned in section 3.5.3 and 3.5.4.

3.5.3 Energy

![Figure 13. Screenshot of the energy bar](image)

Energy is a special power given by the celestial panda to the four player characters. The amount of energy is visualized by the energy bar which is located at the top right corner in the screen (Figure 13). When a player character is using its energy, the amount of energy decreases and the movement speed of it increases. It is visualized by some effects (Figure 14) when using this special power.
Players can only activate energy when the amount of energy is full. When the energy is used up, the speed of a player character decreases back to normal and the energy recovers slowly. When a player characters is talking to a non-player character or a kit is used, the amount of energy remains unchanged.

The increase in speed and the recovery rate of the energy are different for different player characters as player characters have their own statistics. The details of the player character will be introduced in section 3.5.6.2.

Figure 14. Screenshots of the golden retriever and deer when they are using energy
3.5.4 Kit

A kit is a dialogue that contains a question related to a moral value and it is given by the celestial panda. Each player character has three kits and the content of them is different. For example, the content of kits for the bear focuses on respect while that for the deer focuses on politeness. The number of kits is shown at the top left corner of the screen. The details of the distinct content of kits will be mentioned in section 3.5.6.2.

![Figure 15. Screenshot of using a kit](image)

When players use a kit, a dialogue panel will be displayed with a question (Figure 15). If a correct choice is made, the energy of a player character recovers back to full. Otherwise, nothing happens.

Once it is used, players have to make the choice and it cannot be cancelled.
3.5.5 Blessing

A blessing is a special ability that can pass through certain objects. It is given by the elephant in the gathering place scene. There are three types of blessing that are available to players, which are Rock, Bush, and Tree. Players can only choose one of them in the conversation with the elephant (Figure 16).
3.5.6 Characters

3.5.6.1 Character Statistics

There are four attributes to evaluate the performance of a player character. They are the energy limit, speed, speed multiplier, and recovery. Different player characters have their own statistics.

3.5.6.1.1 Energy limit

Energy limit is the maximum amount of energy that a player character possesses. It is equivalent to the length of time that a player character can speed up.

3.5.6.1.2 Speed

Speed represents the distance a player character can travel in one second.

3.5.6.1.3 Speed multiplier

Speed multiplier is a float number for calculating the energized speed of a player character. The energized speed equals to the multiplication of the speed and speed multiplier.

3.5.6.1.4 Recovery

It is the rate of recovery when all energy is consumed.
3.5.6.2 Player characters

3.5.6.2.1 Bear

Bear (Figure 17) has the highest speed multiplier and the lowest recovery rate.

He does not know respect well and therefore the celestial panda decides to give him kits with the theme of respect.
3.5.6.2.2 Deer

Deer (Figure 18) has the highest recovery rate of energy and has decent performance on other attributes.

She always being rude to others and therefore the celestial panda decides to give her kits with the theme of politeness.
3.5.6.2.3 Golden Retriever

Golden retriever (Figure 19) has the highest speed and the lowest speed multiplier.

He always tells lies and thinks it is funny. The celestial panda decides to give him kits with the theme of honesty.

Figure 19. Screenshot of the golden retriever
3.5.6.2.4 Rabbit

Rabbit (Figure 20) has the highest energy limit.

She has decent performance on other attributes. She often being mean to friends and therefore the celestial panda decides to give her kits with the theme of kindness.
3.5.6.3 Non-player characters (NPCs)

There are two types of NPC which are normal and special.

3.5.6.3.1 Normal NPCs

There is no special credit in their conversations.

3.5.6.3.1.1 Celestial panda

He instructs players the way to use a kit in the tutorial scene. He is a member of the sky with the specialization in telepathy. He is sent to the animal village since a hundred years ago with the mission of preaching moral values. No one knows his appearance.

3.5.6.3.1.2 Cow

A member of the animal village. He greets players in the gathering place scene.

3.5.6.3.1.3 Cat

A member of the animal village. She guides players the location of the “Virtue Race” in the gathering place scene.

3.5.6.3.1.4 Horse

A member of the animal village. He provides the information of the “Virtue Race” in the gathering place scene.
3.5.6.3.2 Special NPCs

There are special credits in their conversations.

3.5.6.3.2.1 Elephant

A member of the animal village. He grants a blessing to players in the gathering place scene. The details of blessing are mentioned in section 3.5.5.

3.5.6.3.2.2 Gatekeepers

The followers of the celestial panda. There is one gatekeeper in each of the first three stages in the “Level1” scene. A question relating to moral values is given when players talk to them. If players answer it correctly, a position teleportation portal appears behind them. Players can enter it and they are teleported to the next stage. The details of position teleportation portals will be introduced in section 3.5.7.2.
3.5.7 Portals

A portal is a game object that handles scene transition and position teleportation.

3.5.7.1 Scene transition portals

A scene transition portal (Figure 21) is for transiting to another scene. It is red in color. The portal in the tutorial scene, gathering place scene, and the portal in stage four in the “Level1” scene belong to scene transition portal.

3.5.7.2 Position teleportation portals

A position teleportation portal (Figure 21) is for changing the transform position of a player character in the same scene. It is blue in color. The portal in stage one, two, and three in the “Level1” scene belong to position teleportation portal.
3.6 Mechanics

3.6.1 Dialogue

Dialogue is the core component of the game. A dialogue panel appears when players talk to a non-player character or use a kit. It helps to present the background information of the “Virtue Race” and teach children moral values. It increases game interaction.

3.6.2 Racing

Players need to bring the features of the chosen animal into full play, make use of the kits given by the celestial panda, and utilize the chosen blessing, which are introduced in section 3.5.4 and 3.5.5 respectively, in order to finish the race in time.
4. Results

This section includes the work that have been done and the results of the project. Game design, mesh building, dialogue system, character controls, game area decoration, and animators are covered.

4.1 Game Design

The storyline, mechanics, and the flow of the game has been finalized.

4.1.1 Storyline

The story of the game is about an event named “Virtue Race” with the aim of teaching moral values. Players are one of the young animals participating the event. The story is straightforward and easy for children to understand.

4.1.2 Mechanics

The mechanics of the game have been designed and it can be divided into two parts, dialogue and racing.

Dialogue has been used widely in different scenes. It helps to intensify interactions between players and in-game characters. Players can know more about the story background and learn various moral values by answering questions shown in the dialogue panel. Two-choice questions with instant feedback are adopted as it is easier for children to learn and gain a positive and concrete experience. The reward of getting the correct answer is visualized so that player engagement may be increased. For example, a portal appears behind the gatekeeper when players answer its question correctly. This may increase the interest to explore and continue to play and learn. The question style is decided based on the Experimental Learning Theory, which is mentioned in section 2.1. The details of gatekeeper and portal are introduced in section 3.5.6.3.2.2 and 3.5.7.

Racing is an element that helps to increase player engagement. It is the main activity of the player character in the “Level1” scene. With a countdown timer, players would be more active and concentrated in the game.
4.1.3 Flow

The game has five scenes and the flow of them is illustrated in Figure 22.

Figure 22. Illustration of the flow of the scenes
4.2 Mesh building

4.2.1 Character

4.2.1.1 Modeling

The team has made two low-poly animal models (Figure 23) by using Blender but the quality of the self-made models is not satisfactory. The team decided to use free low-poly animal models from the internet.

![Figure 23. Screenshots of the self-made models](image)

4.2.1.2 Rigging and animation

![Figure 24. Screenshots of the rig of a low-poly wolf model](image)
The team has added bones (Figure 24) to the free low-poly wolf model downloaded from the internet so that animation can be created easier. Several animations have been made (Figure 25).

![Figure 25. Screenshots of the idle and walk animations of a low-poly wolf model](image)

### 4.2.2 Environment

The team has modeled, UV mapped, and textured some environmental models.

#### 4.2.2.1 Modeling

The team has modeled 19 low-poly models including rocks, grasses, clouds, trees, and bushes (Figure 26).

![Figure 26. Screenshot of the 19 low-poly models](image)
4.2.2.2 UV mapping

The team has done UV mapping, which is a process of projecting a 2-dimensional image to the surface of a 3-dimensional model, on the created bushes and trees models (Figure 27).

![Figure 27. Screenshots of UV mapping a tree model](image1)

4.2.2.3 Texturing

The team has created textures for the UV mapped models (Figure 28).

![Figure 28. Screenshots of a texture for a tree model (Left) and UV mapping with a texture (Right)](image2)
A UV mapped and textured model is illustrated in Figure 29.
4.2.3 Terrain

4.2.3.1 Unity terrain system and Blender

The terrain tool in Unity cannot create low-poly terrains. In order to create terrain with hard edges, the team first created a terrain in Unity and added a script named ExportTerrain.cs in the Editor folder. Then, the team exported the terrain created as a .obj file and imported this file in Blender. Next, the team added two modifiers, decimate and display, to the terrain model and modified it to a low poly terrain by adjusting the ratios of the two modifiers and changing the texture to “cloud”. An example is shown in Figure 30.

![Figure 30. Screenshots of the terrain (original and modified)](image-url)
4.2.3.2 Low-poly terrain by scripts

The team realized that terrains created by using the method mentioned in section 4.2.3.1 do not look natural. To have terrains with better looking and ease to create, the team decided to write a script to generate a terrain mesh in Unity. The team has studied the principle of creating a mesh in Unity and the Mathf.PerlinNoise function. A script that can generate smooth terrains is written and it functions well (Figure 31). To generate low-poly terrains, the team has studied a light technique named flat shading. The technique to adjust the level of details of the mesh has been investigated. The updated script works successfully and low-poly terrains with natural looking can be generated by a script directly (Figure 32).

Figure 31. Screenshots of terrains generated by a script
4.2.3.3 Shader

A natural terrain should have some variations in color. The team has studied and written a shader script that can set the color of the triangular faces of the terrain mesh based on the height of their vertices. A script that can adjust color distribution have been written to set the color of the material assigned to the terrain mesh. The results can be seen in Figure 32.

Figure 32. Screenshots of low-poly terrains with different colors generated by scripts
4.3 Dialogue system

The content of the game, including character statistics, dialogues, and kits, are mostly stored in separate JSON files. By using LitJson, a .Net library that handles conversions from and to JSON strings, the content of the JSON files can be read and allocated to different game objects. The team has written scripts to build up a dialogue system and it works as follows.

When the game starts, the dialogues of a scene are read from JSON files and allocated to the corresponding non-player characters. When players talk to a specific character, the dialogue of that character is sent to a game object named “Dialogue Manager”, which is responsible for the behaviors of the canvas in a scene. There are two types of panel in the canvas, normal and special. A normal panel is for conversations that has no choice while a special panel is for conversations with choices available to players. The “Dialogue Manager” will evaluate the content of the dialogues sent from different sources and decide the type of panel to be displayed.

The dialogue system works successfully and can handle all the dialogues from non-player characters in different scenes and kits.

4.4 Character controls

The character controls can be divided into two parts, mouse and keyboard.

4.4.1 Mouse

The mouse is to adjust the position and rotation of the camera that attaches to the player character. The camera moves smoothly and the mouse control functions with no problem.

4.4.2 Keyboard

All the input keys, including the WSAD keys or arrow keys, Z key, X key, and the F key, are working as expected.
4.5 Game area decoration

4.5.1 Post Processing

Post Processing Stack, which is a free unity asset published by UNITY TECHNOLOGIES, has been used to adjust and control effects like antialiasing, ambient occlusion, depth of field, fog, bloom, and color grading.

4.5.2 Skybox

The team has used a free unity asset published by BOXOPHOBIC, named FREE Skybox - Cubemap Extended. It has Unity built-in fog support and rotation animation which are great features to decorate attractive and beautiful scenes.

4.5.3 Prefab painter

Prefab painter is an open source, free asset written by Roland09. The team has used this asset to paint and decorate the tutorial, gathering place, and the “Level1” scenes.
4.6 Animators

The team has set up an animator (Figure 33) for each of the player characters. Blend tree (Figure 34) is added to control the transition of the animations based on the speed of the player character.

![Figure 33. Screenshot of the animator of the deer](image)

![Figure 34. Screenshot of the content of the blend tree of the deer](image)
5. Difficulties encountered

5.1 Looping animation

Animations like idling and walking are looping if the actions continue. The team discovered that there are some small delays for these animations and realized two mistakes were made after some research. The first problem was that the first and last frame shared the same values, which implies the location and rotation values are the same. A delay of one frame was therefore resulted. The second problem was that the team used Bezier curve for the keyframes rather than linear curve. Since Bezier curve in Blender ease-in and ease-out of the first and last frame, a small delay will be resulted (Figure 35).

![Figure 35. Screenshot of setting keyframe interpolation](image)

5.2 Modeling

The team has limited experiences and knowledges on rigging and making animations for models. The animations made are not smooth and look weird at certain angles. Moreover, rigging and making animations take significant amount of time which slows down the progress of the project. Furthermore, the free low-poly models available on the internet may not share the same style. The team eventually decided to buy a unity asset named “Low Poly Animated Animals” which is published by POLYPERFECT.
5.3 Character Controller

A “CharacterController” component is added to each of the player characters. The problem of using the “CharacterController” component is that it neither responds to nor uses physics. Player characters do not tilt to an angle when walk or run on slopes. The team has tried to send a ray from the position of the head, body, and tail of the animal model to the ground and get the three normal directions. After that, the team tried to get the three tilted angles by using the cross-product function in Unity. The team eventually get the average of the three angles and set it to be the rotation of the animal model. However, the result is not satisfactory. The problem remains and the team has been investigating the issue.
6. Future works

6.1 Pause panel

The game does not have a pause panel and it can be inconvenient to players. The team has planned to add the pause panel to the game so that players can pause, resume, and quit the game easily.

6.2 Character Controller

The player characters do not tilt at an angle when they are on slopes. The team will attempt to fix the issue so that the player characters can behave more naturally.

6.3 Sound effects and background music

There is no sound effect and background music in the game. The team will add them to the game in the future.

6.4 Features

Features can be added to make the game more challenging and interesting. For example, rivers or lakes which prevent player characters from passing through can be added to the stages in the “Level1” scene. The team will ponder and implement feasible game features in future development.

6.5 Levels

There is only one level available to players. More levels with new content will be implemented.

6.6 Multiplayer

It would be fun if players can compete with each other. The team will consider the idea of multiplayer and attempt to bring it into practice.
7. Conclusion

This final report introduces the motivation of developing a 3D role-playing game that runs on PC client. The game aims at teaching the children moral values, including respect, politeness, honesty, kindness and perseverance. Five scenes are included.

The Flow Theory and Experiential Learning Theory are studied and previous educational games for teaching are reviewed. The growing trend of educational games is illustrated with some facts.

The storyline of the game is covered which is about an animal racing challenge named “Virtue Race”. The game is developed in low-poly style and the game engine used is Unity. All the scripts are written in C#. Blender is used as the modeling software and Photopea is used to create textures and sprites.

The game has two mechanics: dialogue and racing. Dialogue is the core component of the game that helps to present the background information of the “Virtue Race” and teach children moral values. Racing is an element that helps to increase player engagement. It is the main activity of the player character in the “Level1” scene.

The story, aesthetics, technology, and scenes of the game are presented. Game settings like controls, energy, kit, blessing, portal, and characters are introduced with figures.

Results of the project are demonstrated. The game design has been finalized. The mesh building of the project is illustrated with figures. The dialogue system and character controls work successfully. The game areas are decorated with illustrations.

This document illustrates the difficulties encountered which are looping animation, modeling, and character controller. The team has used assets from the unity asset store and GitHub to facilitate the progress of the project and tackle some problems faced. The problem of the character controller persists.

Future works of this project are manifested. The team has planned to add the pause panel, sound effects and background music, and more levels to the game. Multiplayer
mode and new game features are considered. The team will attempt to tackle the problem of the character controller in the future.
Asset used

1. Low Poly Animated Animals (POLYPERFECT)
2. FREE Skybox - Cubemap Extended (BOXOPHOBIC)
3. Farland Skies - Cloudy Crown (BORODAR)
4. 3D Game Kit (UNITY TECHNOLOGIES)
5. Post Processing Stack (UNITY TECHNOLOGIES)
References


