**Team No.18**

**Team Members:**

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|---|---|
| Tao Yang | 2905225 |
| Chenyu Hao | 2896141 |
| Carlos De Vera | 2925639 |
| Quchang Zhang | 2946672 |
| Maokun Huang | 2902235 |

**Project Name:**

Unique School

**Project Synopsis:**

The player can control the character running and jumping; therefore, people can explore and collect items on the map.

**Project Description:**

**\*Why is the project being undertaken?**

We want to provide an opportunity for those who are not able to come to campus the ability to explore the school grounds in the world of a video game while giving exciting challenges and unique experiences that can only be achieved in our created world. The users will be able to fully explore the school, and though it may not be exactly like being on campus in person, they will have the chance to gain experiences possible only in the virtual world.

**\*Describe an opportunity or problem that the project is to address.**

For students unable to come to campus, either due to health reasons or other extenuating circumstances, they will be given the opportunity to enjoy a semblance of school life without risking their health or making compromises detrimental to their situation.

**\*What will be the end result of the project?**

The users will become familiar with the campus. It could serve as an alternative to coming to campus, but they could still enjoy a semblance of student life in a fun and new way.

**\*Project Milestones:**

First semester:

| Milestons | 2021 | | | | |
|---|---|---|---|---|---|
| | Sep.26 | Oct.17 | Nov.7 | Nov28 | Dec.9 |
| Conceive the game | Tao Yang, Chenyu Hao, Carlos De Vera, Quchang Zhang, Maokun Huang | | | | |
| Build the map of the game | | Tao Yang, Chenyu Hao, Carlos De Vera, Quchang Zhang, Maokun Huang | | | |
| Resources (art, music, etc.) research | | | Tao Yang, Chenyu Hao, Carlos De Vera, Quchang Zhang, Maokun Huang | | |

| Build up some tests for the game function | | | | Tao Yang, Chenyu Hao, Carlos De Vera, Quchang Zhang, Maokun Huang |
|---|---|---|---|---|

Second semester:

| Milestons | 2022 | | | | |
|---|---|---|---|---|---|
| | Jau.17 | Feb.7 | Feb.28 | Mar.14 | Apr.4 |
| Get some basic elements, such as the interface UI of the game | Tao Yang, Chenyu Hao | | | | |
| Get the basic functions of the game, such as the movement of characters in the game | | Carlos De Vera, Quchang Zhang | | | |
| Optimize the program, including modification on the model and sorting out the code | | | Maokun Huang | | |
| A complete game | | | | Tao Yang, Chenyu Hao, Carlos De Vera, Quchang Zhang, Maokun Huang | |

**\*Project Budget:**

| Computer resources | Unity |
|---|---|
| Estimated cost | $0（Unity supply some free resources） |
| The Steamworks Distribution (Optional) | $100.00 |

Steam is a video game digital distribution service by Valve. The game player usually finds and plays the game on steam. By 2019, over 95 million monthly active users. According to steam: "*In order to get fully set up, you will need to pay a $100.00 fee for each product you wish to distribute on Steam (the "Steam Direct Fee").*"

**\*Preliminary Project Design**

How the software works

Because of the reasons for the past two years, students cannot return to the campus in time. We designed this game to make more students familiar with and understand the campus in the electronic world. Our game is that the player enters a classroom as a small character to explore different kinds of objects. This game can not only familiarize students with the school but also become a stress relief tool for some students who are under pressure. Moreover, this game is very gentle, without any negative energy, so it can be tried by younger students. Also, we believe our project can show a different campus.

Our software is based on Unity to develop and operate on Windows. We will use the C# to achieve the software. Unity game engine is a powerful tool to help developers to build their game world. Because it has a robust ecosystem that includes 3D animations, characters, and environments, etc.

The project has two main parts characters and a map environment. When the player first time starts the game, the game show background information to the player. Start a tutorial guide the new player move to the collection items position and this also show to the player they need to collect the what type of item in the game. The character that the player control can move and jump and explore the map. Below is our game design diagram.
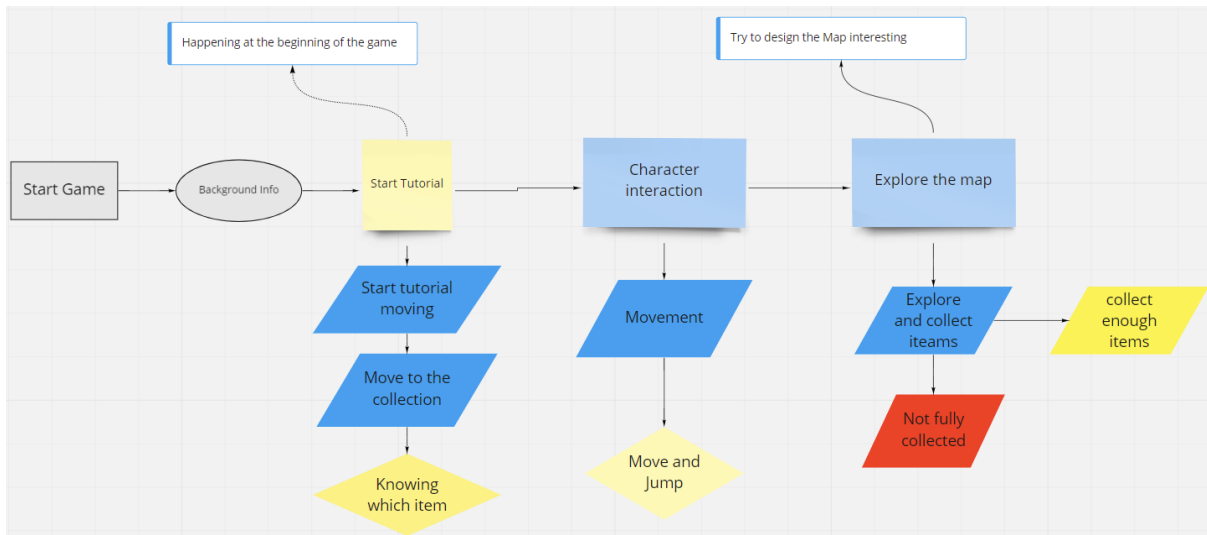
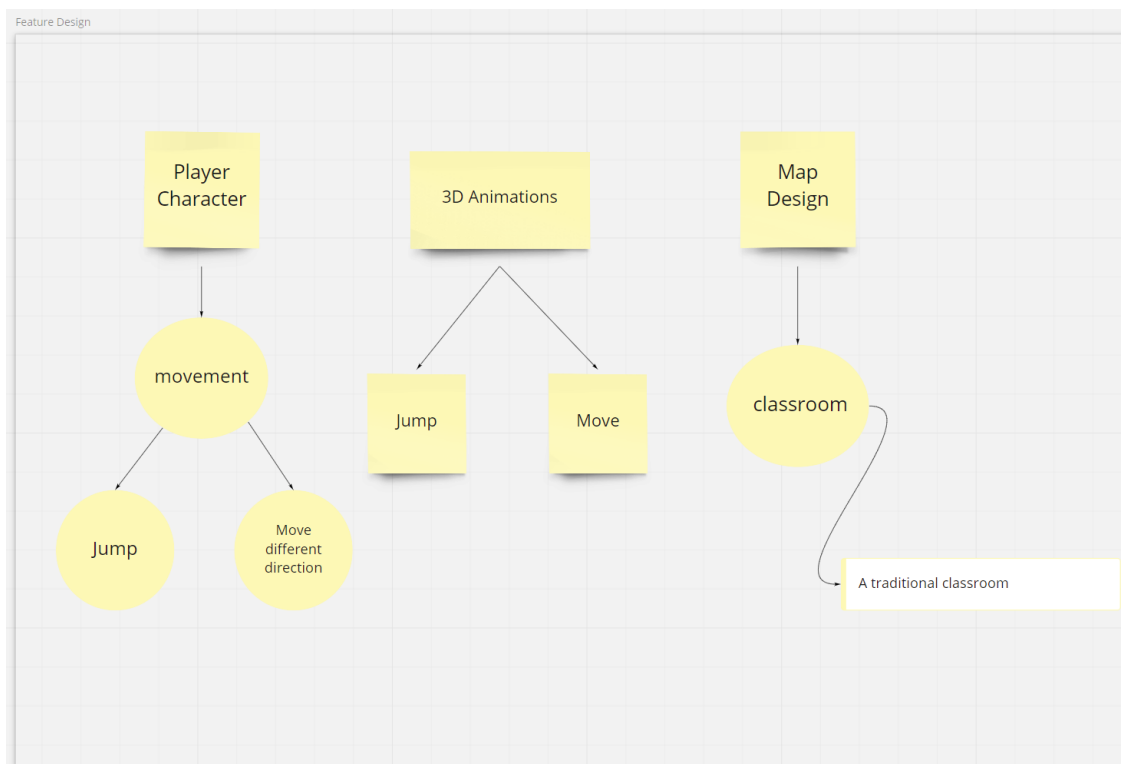*figure 1 Game Design Diagram*



*figure 2 Feature Design Diagram*

In the map design part, we will download some Packs, which Unity provides some free material, for our initial map material. We will use Snaps Art HD for our main material Pack. This Pack provides 172 prefabs for specific types of rooms, 65 prefabs Classroom, 52 prefabs Bathroom, 52 prefabs Bathroom, 14 prefabs Corridors, and 31 prefabs Outdoor area and a porch. then using those materials to build our map, to build a classroom map. Our game character will explore this map and begin his adventure.
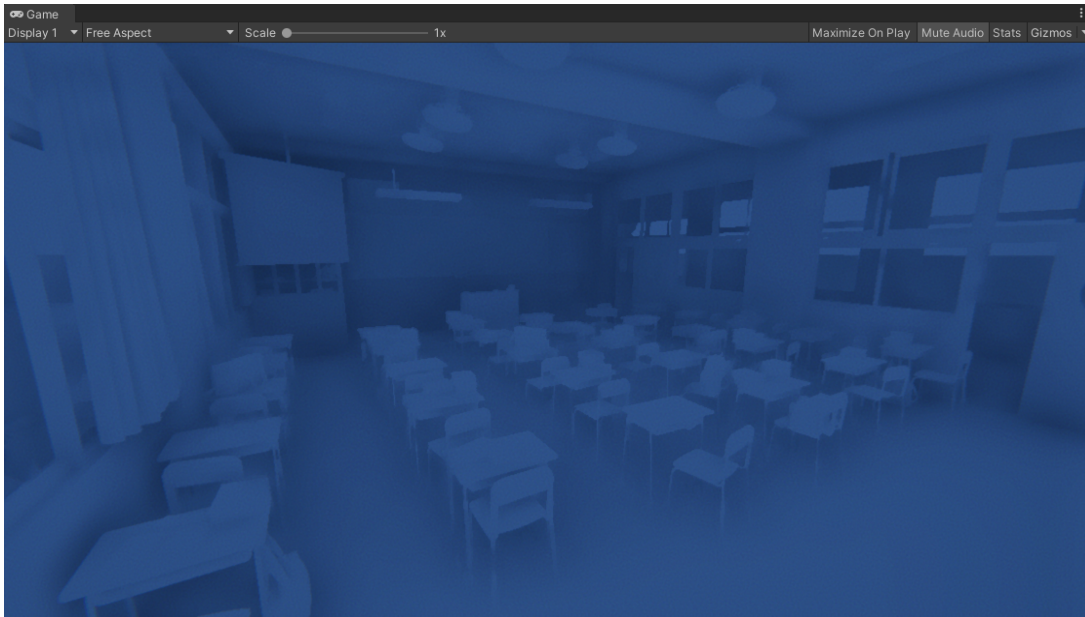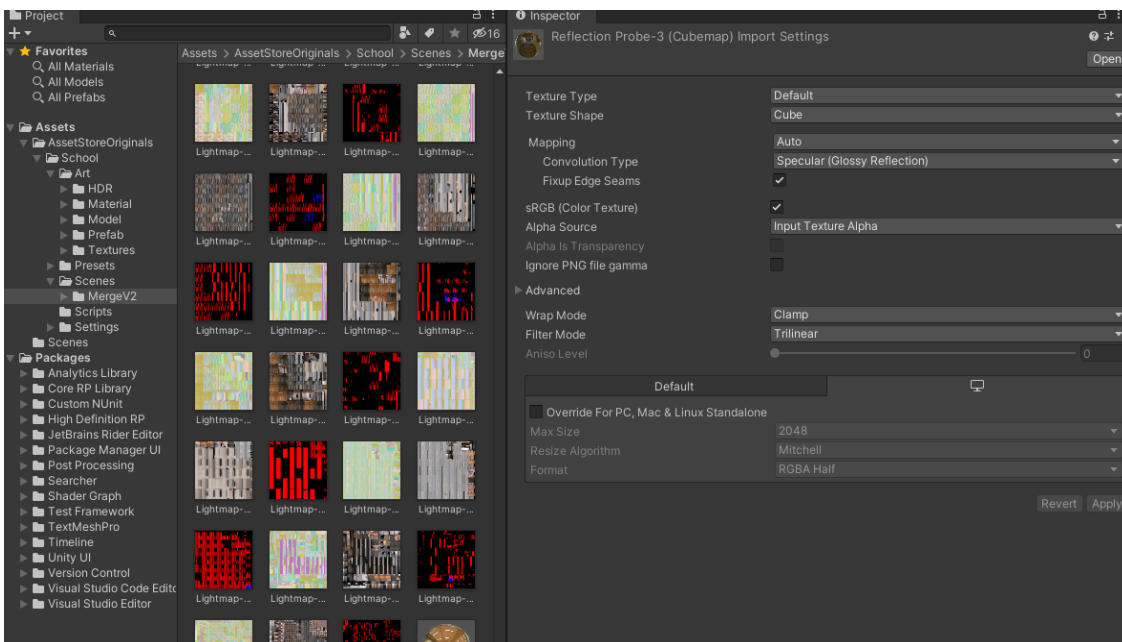
*figure 3.1 initial map material 1*



*figure 3.2 initial map material 2*

At the player character part. Our game will give the player one character to control. I think this is a very important part of our Project. Because the game is a kind of adventure game, all implementations are based on role movement. Therefore, at the beginning of the code part, we need to write his mobile function in code. The basic movement is forward, backward, left, and right, and the character can move in all directions within the map. After completing the basic movement, we need to continue to add some advanced actions, such as jumping, squatting, and crawling. These actions allow the character to choose appropriate actions to pass the obstacles when encountering some obstacles. When the advanced action is completed, the third part of our code for the character is picking up things, which is similar to

picking up items for Super Mario. Our characters can pick up different things to use. After this, we will write about the functions of different props and their usage. This is all our code for the character.

The 3D animations part, this part will achieve the character actions. This part also needs to download some Packs from Unity. We will use ready-made materials to achieve this part. Our team doesn't have the skill to do new animations. Unity supply a lot of those materials for us to choose from.

The game begins and ends. After clicking on the game we designed, a start interface will appear for this game. This interface displays the player's start button and exit button. And we will choose a background image as the background of this interface. After the game is over, an interface will also appear, this interface will display restart or exit the game. There will also be a different background in this interface. Similar to the previous start interface. These codes can be implemented based on unity.

## *Design constraints

*Technology Constraints*: We choose C# as our development language. Because we decided to use Unity as a tool for development and C# as the recommended language, we decided to adopt it. Because steam may be used as the upload platform in the future, and windows as the platform with the most steam users, the windows platform is our first choice. Not only that, because of the materials provided by Unity (such as models, maps), this can effectively help us reduce the workload. However, it should be noted here that due to the limitation of the resource package, the Unity version needs to be fixed in 2018.4 (the new version of Unity changes the data encapsulation)

*Business Constraints*: Regarding the time plan, we decided to implement it in accordance with the milestones we set to the top, but taking into account some non-human factors, this plan can only be used as a reference at present. In terms of production, our initial budget is 0, because most of the materials are free. But if uploaded to the Steam platform,which is the most popular game platform, we should pay $100 for the Steam Direct Fee. Regarding the licensing of software and some materials, we will strictly abide by relevant regulations. When using third-party materials, if there is an option that requires payment, we will increase our budget for purchasing materials to protect the rights of developers.

**Other Constraints:** Third-party constraints, considering the impact of the epidemic, team members cannot spend a lot of time on offline discussions, which will have a certain impact on the progress and level of refinement of the project. On the other hand, because of the different courses, the workload of each person each week cannot be synchronized. So synchronizing everyone's progress will also be a challenge for us. And this is the first time for everyone to design a game, and it may also become a potential problem for later debugging, because some debugging points may be missed during debugging, and some unpredictable errors may occur when the game is running.

**\*Ethical Issues**

One of the ethical responsibilities each team member in our team has to keep wary off is being fair to one another while working on this project. This project has the potential to be developed enough that we would be able to market our game and in doing so, we must keep in mind the work that each person has contributed to the game. By claiming who worked on the project, the time spent and effort in creating the best work that we are capable of into this game, we are responsible for each member getting compensated for the amount of work put in. It would be unethical for one person to take credit for the effort of five individuals. As a team we are all ethically responsible in keeping each other in check and making sure that each member keeps their ethical responsibilities.

**\*Intellectual Property Issues**

The most important issue is we need to make sure our project quoted other people's resources and we have the authorization. If we use the resources or assets from Unity Asset Store, we may face the problem with can we use the Assets in our personal or even a commercial project. Basic on Asset Store Terms we notice that after we purchased or downloaded an asset from the Asset Store we can use those assets and use them in a personal or commercial project without extra payments. We only need to pay attention to the asset is non-restricted, Unity assets store has some "Restricted Assets" that are only valid for personal and non-commercial use only. Therefore, if we use the asset or resource from Unity Asset Store, we should not face intellectual property issues.

**\*Change Log**

| Change | Reason |
|---|---|
| Project name | Change to Unique School, the previous name is too broad. |
| Change the first-semester milestone | In the beginning, our milestone is "writing the first line of code". Now, we change it to " Build the map of the game". |
| Project Budget: Add the Steamworks Distribution (Optional) | Players usually download games on Steam, which is one of the most famous digital distribution services. Today, games prefer to publish the digital version. |