



uOttawa

University of Ottawa

Faculty of Engineering

Department of Biological and Chemical Engineering

GNG1103 – Engineering Design

PD D: Conceptual Design

Team 3.1:

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Introduction:

Conceptual design is one of the most important and creative steps of the design process. This is when teams ideate, sketch, and discuss the many possibilities of the aspects of their product. To do this, design teams must reflect on their product's design criteria and benchmarking to create “subsystems” or aspects of the design.

Our team has researched and discussed how a virtual reality tool to teach empathy will be created. We have talked with the client and discussed their needs as well as met with the panelists on whom the plot of the experience will be based. Lastly, similar products were researched, benchmarked, resulting in the design criterion to be formulated for this project.

Subsystem Overview

In this report, six subsystems were created to properly sketch the virtual reality experience. These subsystems were created based on the design criteria from the previous deliverable. The six following subsystems are:

- Main Menu/In-Game Menu
- Accessibility Aids and Settings
- Interactivity (objects in the game to interact with)
- Environment (where the scenes of the experience will take place)
- Characters in the experience
- Plot of the experience (Which panelist will this be based on?)

Global Concepts:

Each team member sketched or drafted a concept for each subsystem and as a team a global concept for each subsystem was collectively chosen. This global concept was formulated based on all team members' sketches. All the sketches/drafts will be found in the Appendix.

First, the main menu, as shown in Figure 1, will be the first to see when the users open the experience. From there, the user will have the options of starting the game, quitting the game, opening settings, and checking the credits. The start button was chosen to be inserted on the mirror because it allows the user to have a brief description on who their character is.

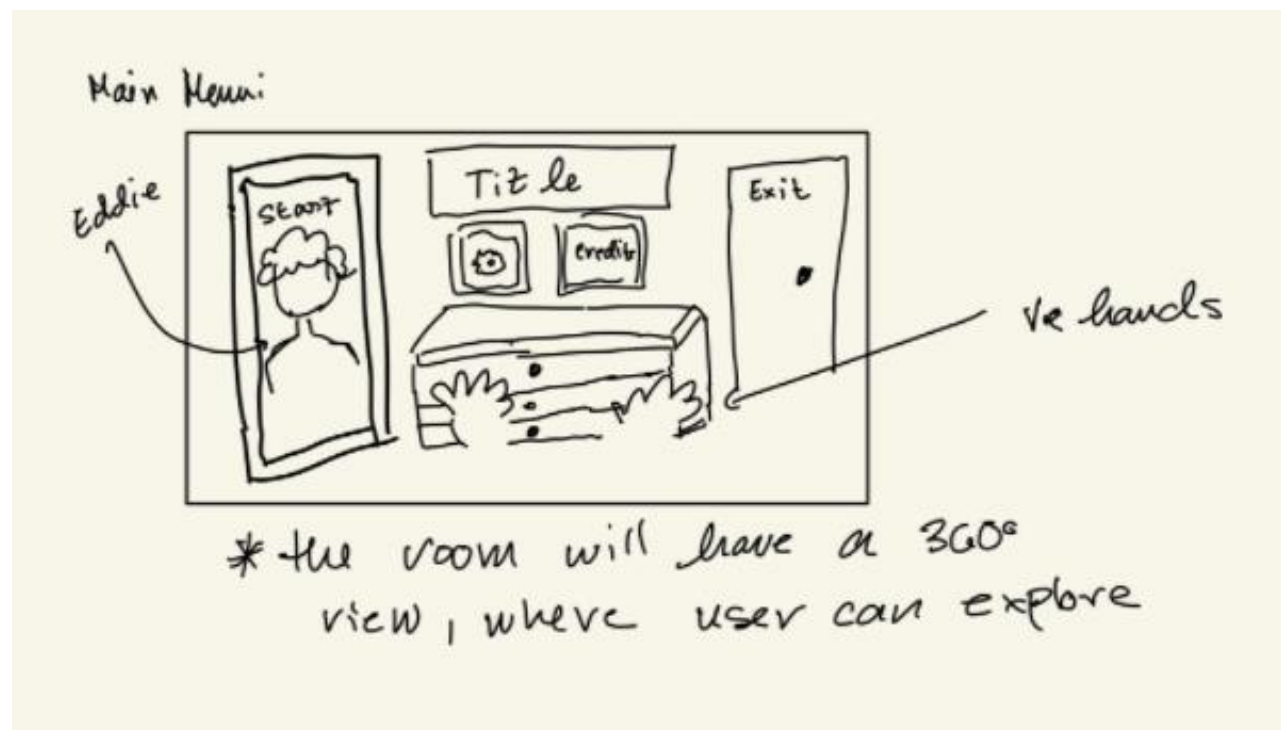


Figure 1: The main menu of the video.

In the settings, users can increase or decrease the volume or the sensitivity, turn the caption or the audio description on or off and switch the system language between English or French, as shown in Figure 2.

The team chose two styles for the closed captions. The first style, a box with text, will be used during a one-on-one dialogue screen. However, in a crowded scene in the experience, we decided to add thought bubbles for the NPCs (non-playable characters). This will help people with hearing problem distinguish between the dialogues and the actions of the characters. For example, it allows the users to be able to know when the characters are laughing or talking.

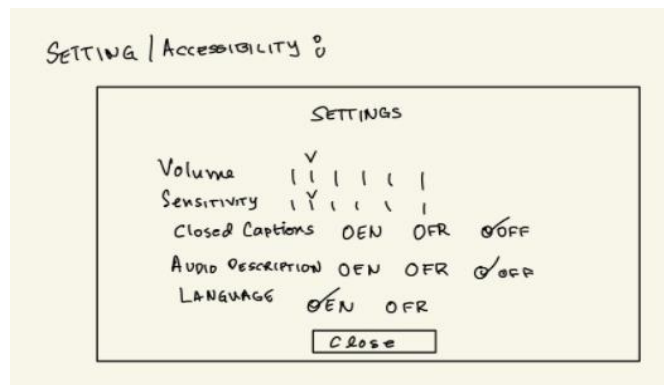


Figure 2: The settings of the video.

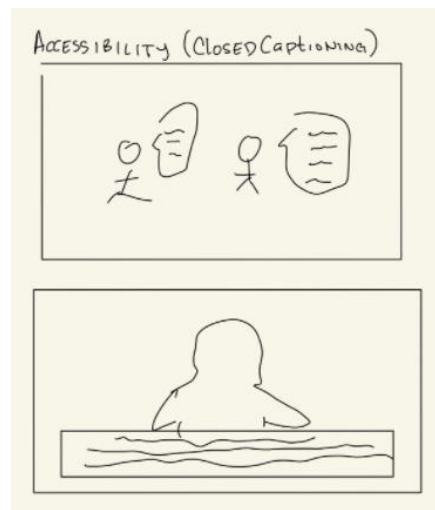


Figure 3: The two options for closed caption which are the thought bubble (top) and the regular text in the box (bottom).

The virtual reality experience will offer an array of interactivity for the user as shown in figure 5. For example, the users would be able to interact with the picture frames on the wall to see a brief description of the characters in the game. Another example would be when the user is having dialogue with another character in the game, sometimes, the users will have options on what response they want to say. Lastly, the remote control in the living room can be picked up and used to turn the television on and off.

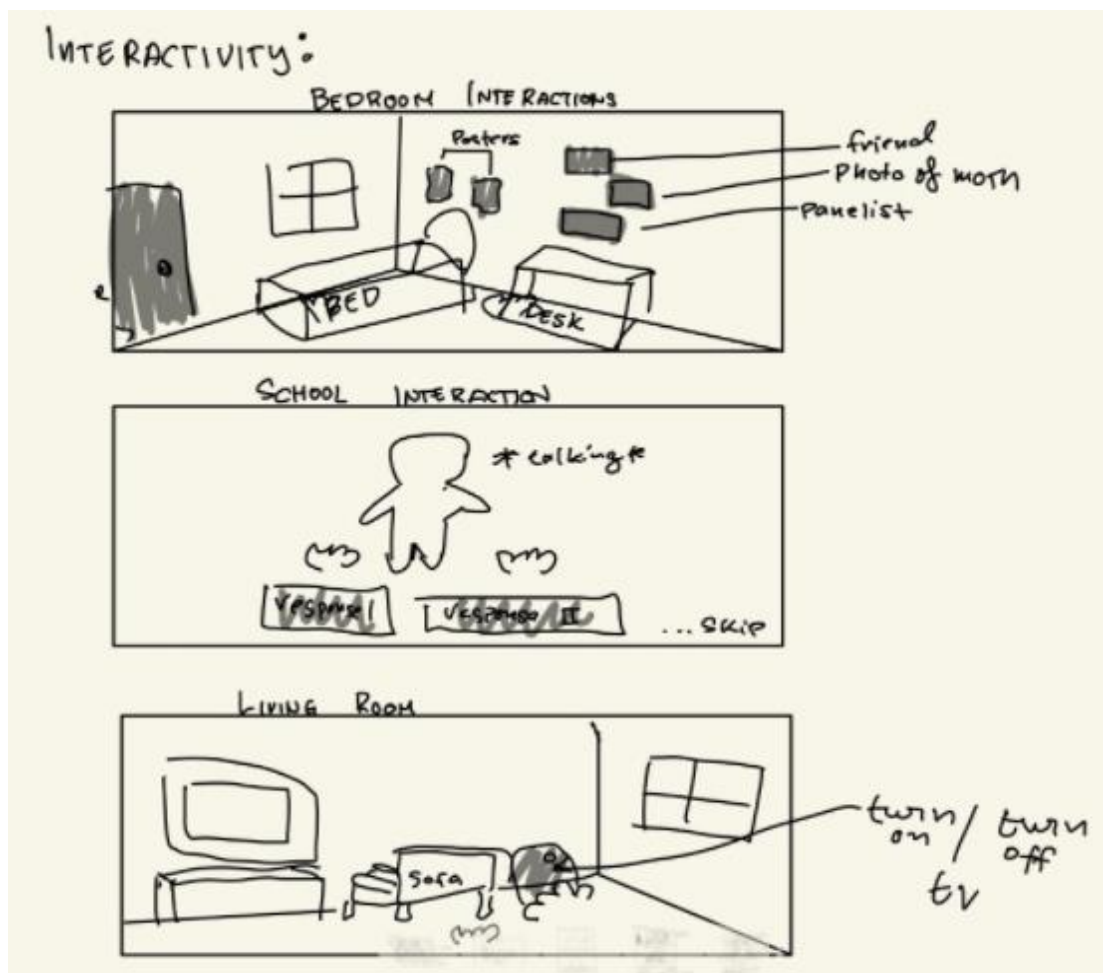


Figure 3: The interactivity of the video.

The environment of the video was set at a bedroom where the user will see the character through the mirror which is the same as the start menu. The second scene will be then done in the living room where the mother helps her the character get ready to go to school. Next scene will be at school, where the user will experience the core scenes of the project. The global concept for each environment will be found in Figure 5.

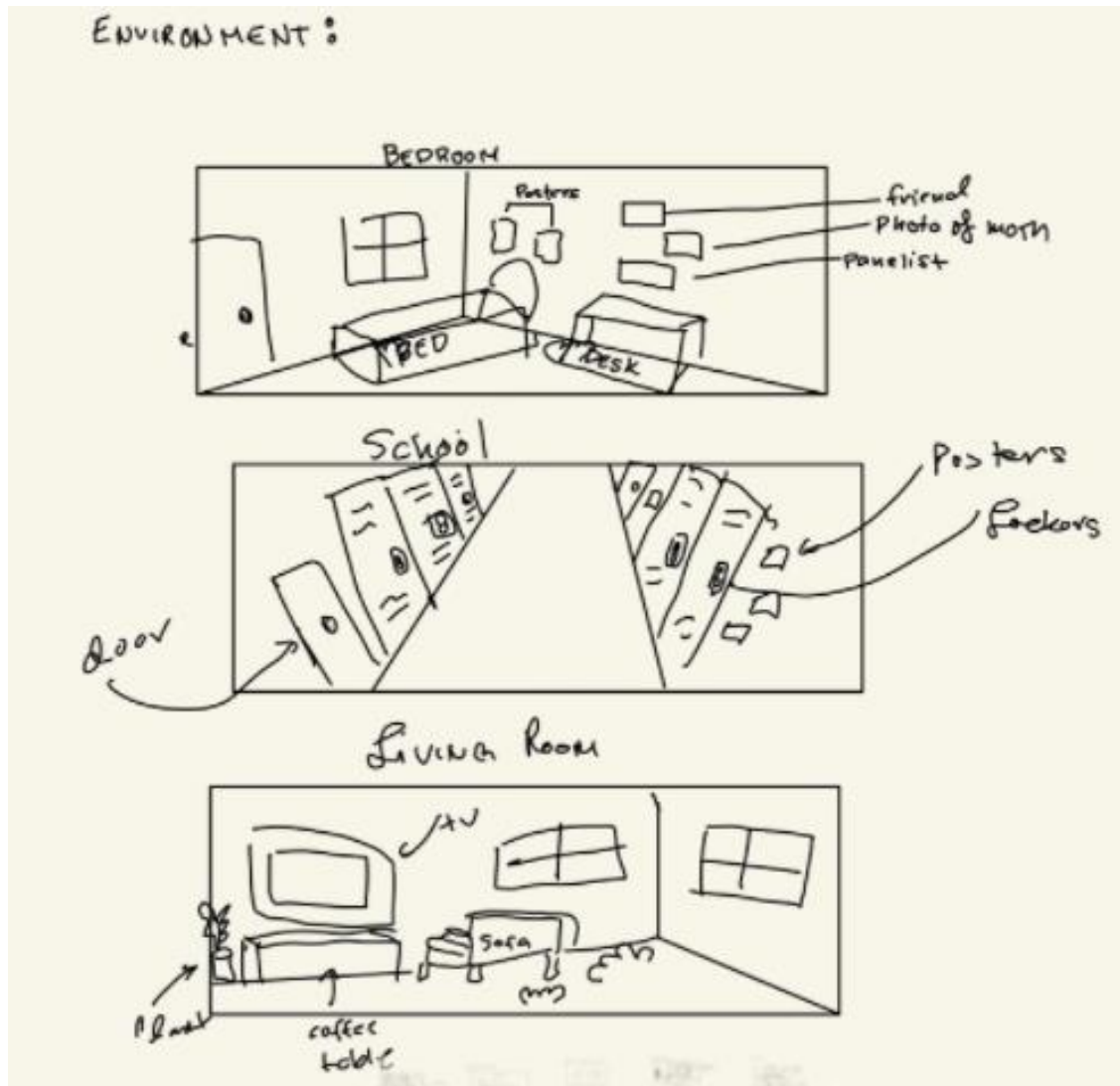


Figure 5: The environment of the video

The characters, as shown in Figure 6, are low poly design to help the experience run more smoothly. The main character as played by the user is controlled through daily

life. The character will be African-American and evidently in his teens. His mom is a kind-looking familiar face that the user should feel comfortable around. The user's mom will be also African-American and in her early 40s. The bully is a mean student around the same age who makes racist comments and disrespects the main character. A friend is someone who is easily approachable in the school hall and talks to the user. The friend will be the same age as our user's character. The teacher, who is in his 40s, acts professionally but still makes some micro aggressive racist comments.



Figure 6: The characters of the video

Lastly, the plot of the experience was also written during this brainstorming session. As a group we chose the best aspects of each other's drafts and made a global concept for our plot. The experience will proceed as follows:

The game starts at home. The character gets ready for school and the mom puts hair care products on her son's hair. It transitions to a new scene at school, and everyone is looking at the character. You have the option to ignore or choose to avoid hallways. Both options will still result in the character blinking and taking them into a cage where people try to touch their hair. The option is to yell or cry. Blinks into a classroom. The teacher picks on the character and says a microaggression comments to the character. At the end, the character will wake up and get his graduation cloth with a certificate that shows an Excellent CGPA going to the living room where the Juneteenth is on news. Thus, we show that although our character has been through all this these difficulties, he was able to succeed and overcome these difficulties and the Juneteenth will show that there are still actions to end racism and enhance equity.

Conclusion

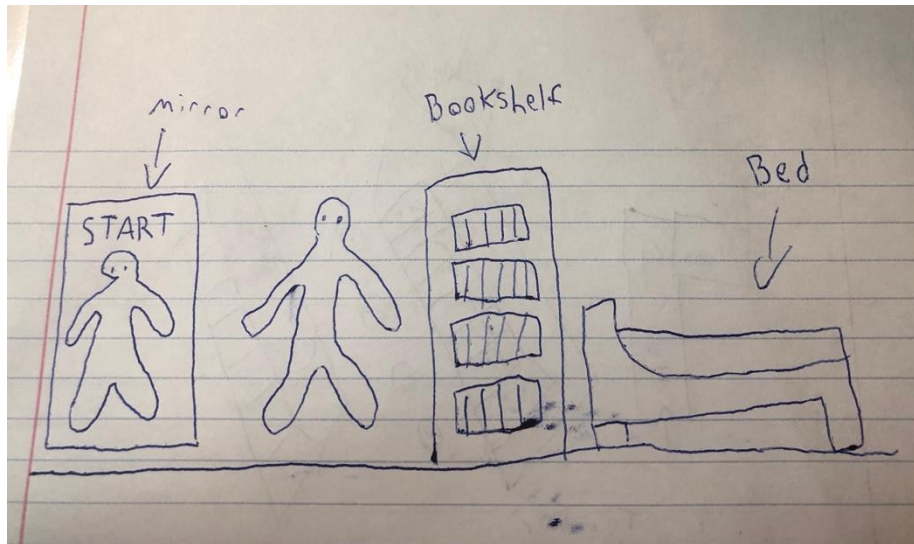
The ideation stage was not only the most creative stage in the design process but also bonded mostly by the group. It was believed that when each team member presented their ideas to one another, it was felt like each member has been heard and their work was appreciated. At the end, as a group, six concepts/subsystems were decided to be included in the video: main-menu layout, settings interface, interactivity options, environment, character design, and experience plot. Lastly, as a team, we carefully drew global concepts based on each other's sketches.

Appendix

Main-Menu:

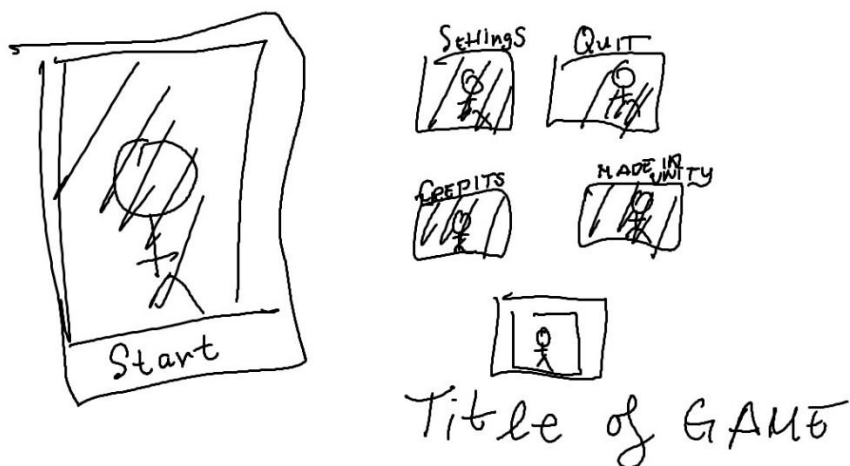
Brad:

The user will be first in the dorm room where there will be mirror that will reflect the user's character as well as a photo of all the panellists on the wall (with a logo that express equity. From here the user can adjust settings and get a feel for the controls before the game starts.



Mackenzie:

Options in Main menu are to Start the game, quit the game, adjust settings, credits to developers and university, credit unity, present title of the game, and lastly to display the main character



Thai

When you click in start, u will start in your dorm room

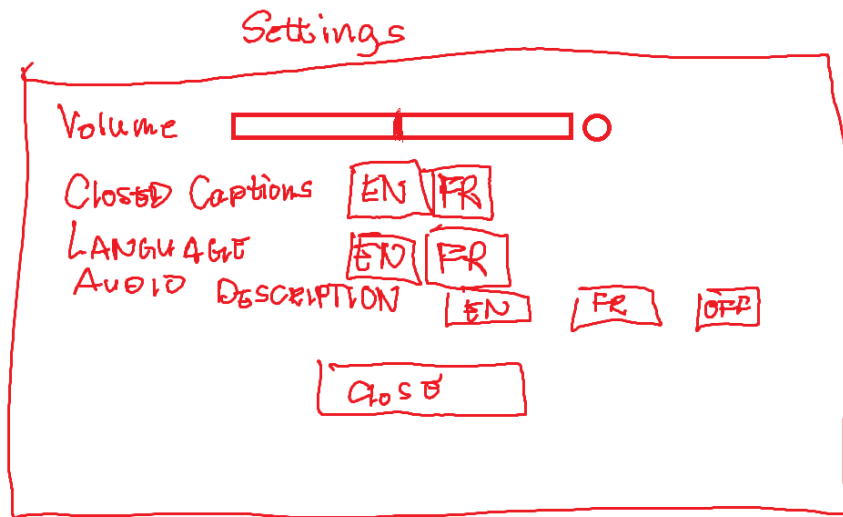
Main menu



Accessibility aids/Settings:

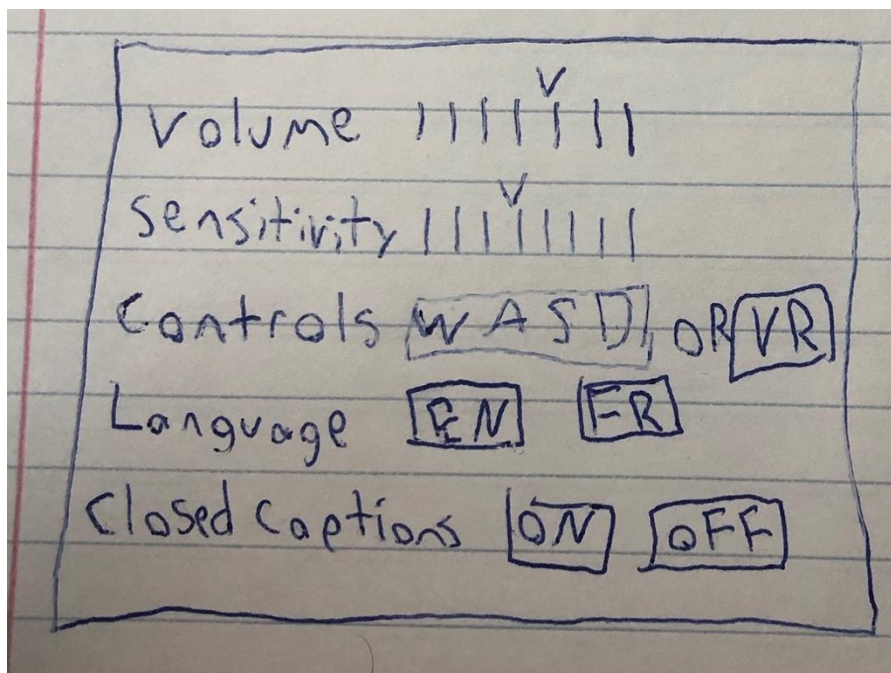
Mackenzie:

The settings will contain adjustments for volumes, options for languages, closed captions, and audio description.



Brad:

The settings menu should be easy to use and have functions to help to user get the best experience possible there should also be different languages and closed captioning to help be accessible to all.



Thai

Setting page

Volume 

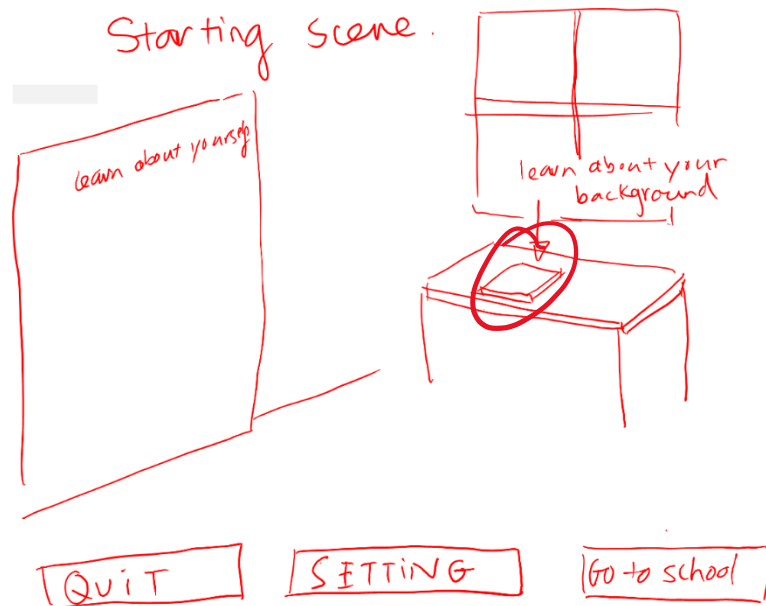
language EN ☐ FR ☒

Subtitle ☐ ON ☒ OFF ☐

right click to increase left to decrease

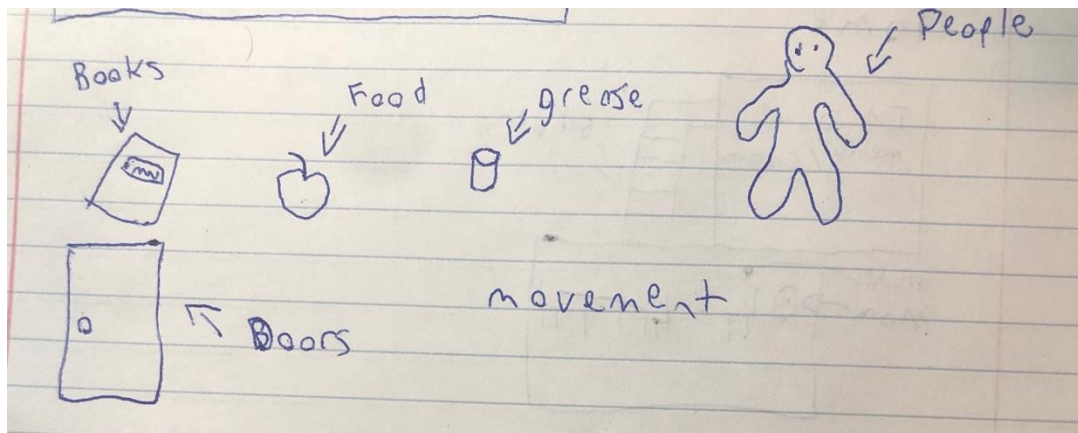
Interactivity

Thai:



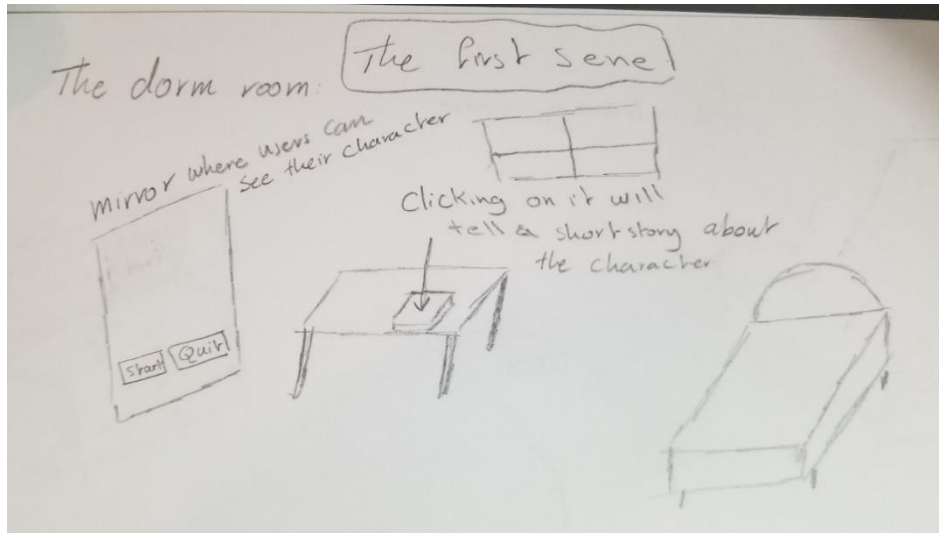
Brad:

To make the experience feel as real as possible there should be objects that the user can pick up and move around like books and items on tables. The user should also be able to interact with people and doors to help make the game flow smoothly.

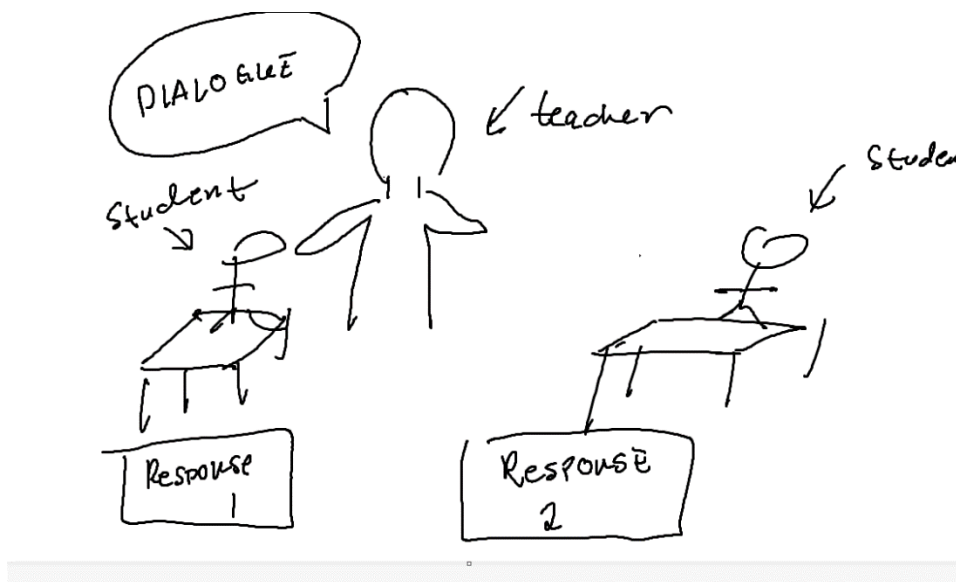


Mishleen:

The user can click on the book which will tell a short intro about the character they will be.



Mackenzie: In one of the scenes, users get to choose a response to the in-person characters.

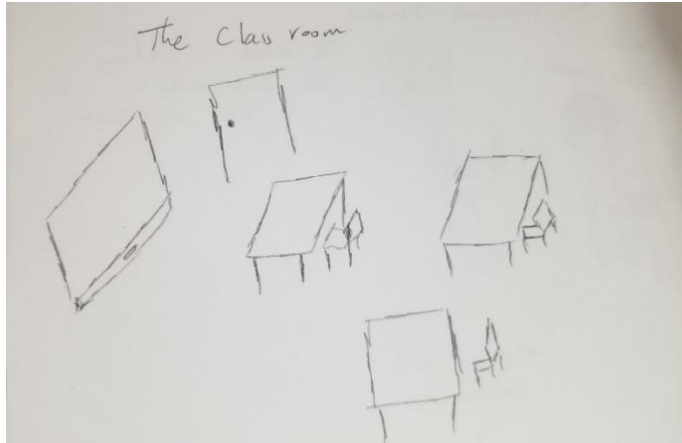


Environment:

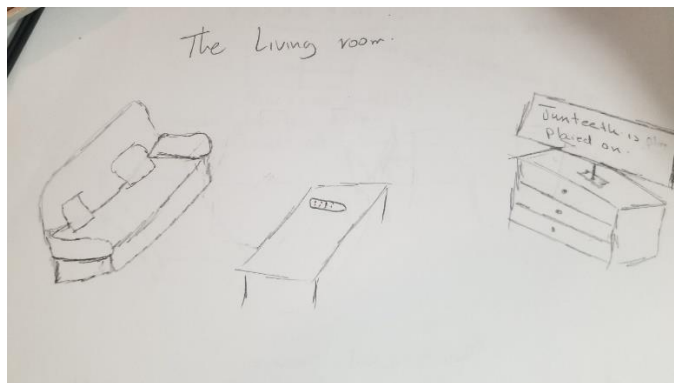
Mishleen:

Some of the environments that the users will experience are:

The classroom where the user will encounter negative experience from the teacher and the students as well as feeling unwelcome and isolated from others.

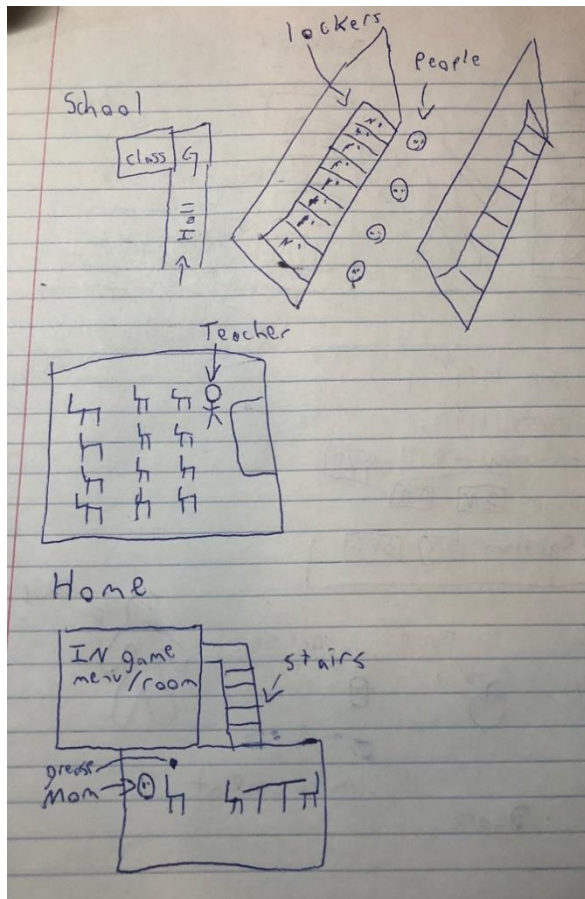


The living room which will be the last scene of the video where the user will see Juneteenth, which celebrates the freedom of enslaved people in the United States at the end of the Civil War, is shown on news, indicating that there will always action to end the racism and enhance equity

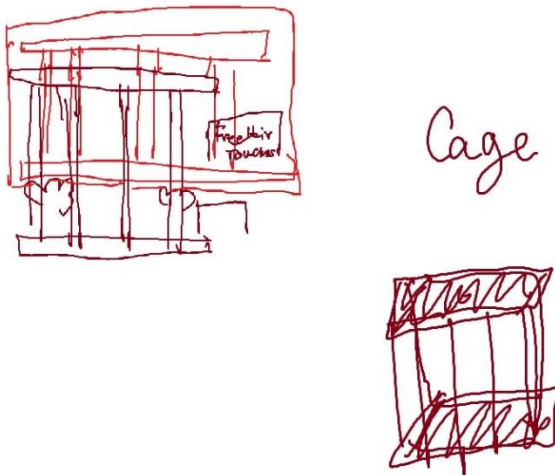


Brad:

The start of the game is in your dorm room then you get called down to see your mom. After the next environment is the hallway to class and then finally the classroom



Mackenzie: In one of the scenes, the cage symbolizes the feeling of being an attraction.



Thai

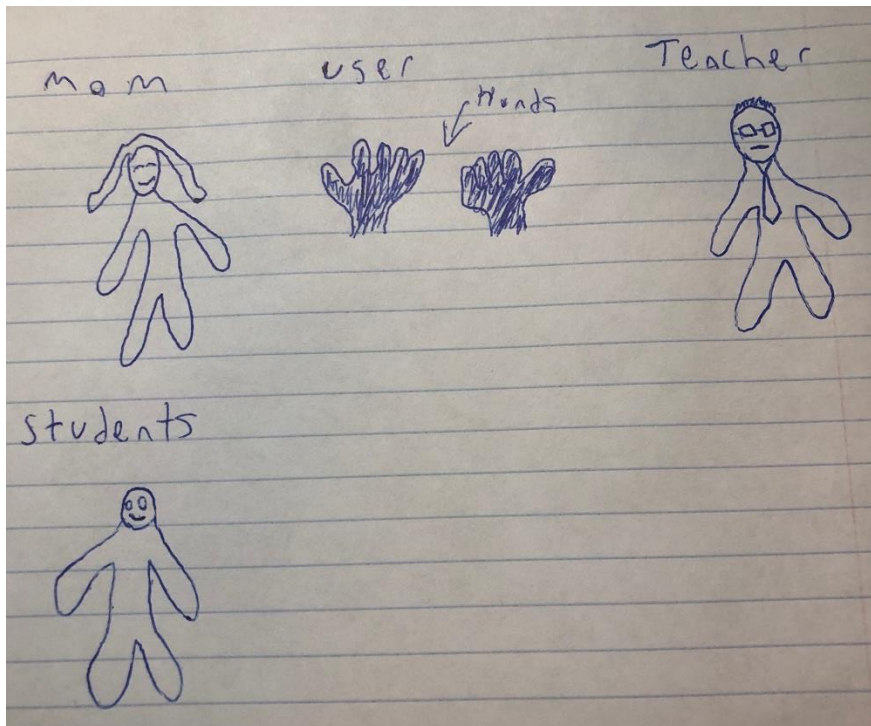
You start at your dorm, when you want to go to next scene, the scene will fade away and you on your mom car, talking and she will put oil product on your hair before you get out of the car and the scene fade away, now you appear in the school hallway.



Characters:

Brad:

The characters are your mom who should be friendly and kind to you and then the other students who don't look like you and just seem different from you. The teacher who is professional but still says comments about you and then yourself where you should be able to see yourself to see your characteristics.



Mackenzie:



Thai



you



the bully boy

4 type of character

- 3 main
- 1 secondary



your mom



random boy

background noise

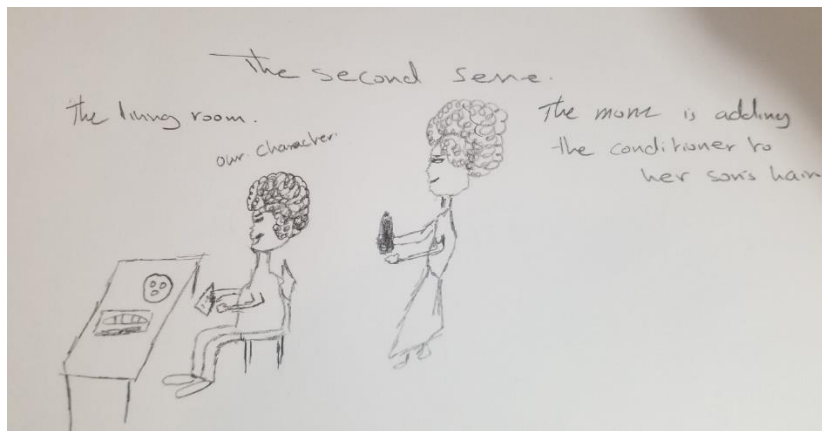
turn away

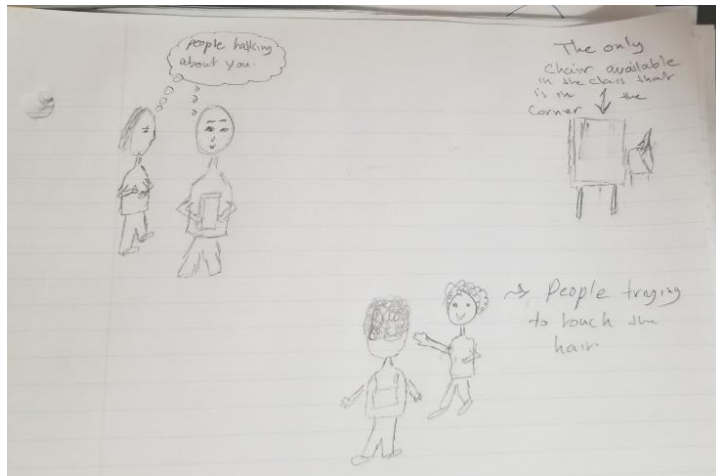
Plot:

Mishleen:

One of the scenes is the mom putting the conditioner on her son's hair which is a care product that will keep the hair healthy (The son will be the user). When the son goes to school, some student will start staring at him and whispering while some are approaching him to touch his hair, trying to know what is that material on his hair. These scenes might help users to experience some of the incidents that people might encounter.

I was wondering if we can make the intro and the final scene a positive experience. For example, the character that the user will see on the mirror is an adult black man. The scene starts with the mom coming to the room and ask her son to sleep well so he gets ready for the big day on the next day. When the character sleeps and this is where the user will blink, it will move to another scene that will show all the experience we describe above. At the end, the character will wake up and get his graduation cloth with a certificate that shows an Excellent CGPA going to the living room where the Juneteenth is on news. So, we show that although our character has been through all this these difficulties, he was able to succeed and overcome these difficulties and the Juneteenth will show that there are still actions to end racism and enhance equity.





Thai



We first start in the main character room where user can learn about their character and his background. After being done with this, user can start the journey, the first scene will be the car scene where the mom will drive him to school and before we get out of the car, she will put some product on his hair. The scene will then fade away again and now he is in the hallway where people start looking at him and whispering something.

User starts in dorm room

When started mom calls user to go to school

Next scene user walks on to a bus while everyone is staring at them

Sits next to friend and starts a conversations

Friend makes a racist joke

Arrive at school and next scene is walk to class but everyone is staring, and some people come up and try touching your hair

You hear people talk to their friends then they turn around and greet you differently like in a different tone

Get to class and no one wants to sit next to you

Get called on by the teacher because your different race

End

Mackenzie:

Wake up – walk to mirror – get ready for school – walk to mirror – blink (fades to dark) – In school – walking in kids looking at you – blinks – in a cage in front of mirror (sign saying free hair touches) – blinks – walking around park – plays with ball – sees old couple (says look they do exist) – blinks (dark) – in school at the boy's locker room – lights shuts off – looks for lighter/flashlight with class mates – I think it just got darker when you walked into the room – blinks – gets home – turn on tv – put Juneteenth news

