

# JOURNEY X

# APP UX

# DOCUMENT

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# **Project Description**

Our project is a mobile AR app that allows Clementi residents and tourists to learn more about Clementi's history and culture. We intend to bring Clementi's heritage back to life by imbuing them in the youth. Using the mediums of art and technology to create an interactive experience, we want to celebrate the historical and cultural significance of Clementi.

## **Background**

We as a group love Singapore's local communities, histories, and areas, and one of those areas is Clementi. Since our school is within Clementi we came to appreciate many parts of it during our years of schooling there. Such as the food, the locations to visit, the community, the shops, the culture, and the history.

We came to appreciate and admire all these parts of Clementi and thus want to spread our admiration back to the community who lives in Clementi and to teach others about the heritage and culture about Clementi. We wish to help others share the same appreciation and love for Clementi through our AR game, and to make it even more immersive for people to try out, to help more people appreciate Clementi. Therefore we wish to work with our stakeholders, especially National Heritage Board (NHB) HAN @ Clementi and the residents of Clementi, so that together we can bring more people to come and appreciate Clementi and its Heritage.

## **Goals and objectives**

- Our core objective is to celebrate the history, culture, and heritage of Clementi, reflecting its unique stories, traditions, and landmarks. We aim to introduce more people to Clementi's rich heritage and history through using augmented reality (AR), through our app, we seek to inspire Clementi residents to delve deeper into their heritage, encourage more visits to Clementi, and educate tourists about Singapore's diverse and fascinating background. Additionally, we intend to engage the community in the co-creation of heritage art murals or other works, fostering a sense of ownership and pride in preserving Clementi's cultural legacy

- Our goal is to create an engaging mobile AR app capable of teaching Clementi's residents and tourists more about its heritage and culture. We intend to allow users to scan murals and places of interest to play minigames related to these places. Through the minigames, users of our app can learn more about the Clementi MRT and library whilst having fun playing the different games.

## **Target Audience and platform**

- Tourists
- Previous residents of Clementi
- Current residents of Clementi
- All ages

Our target platform are for all mobile devices to make it as accessible to all phone users,

## **Important Links to our App**

JourneyX App: <https://3soups.github.io/JourneyX/>

Website Link: <https://journeyx-b6325.web.app/>

App Demo Video:

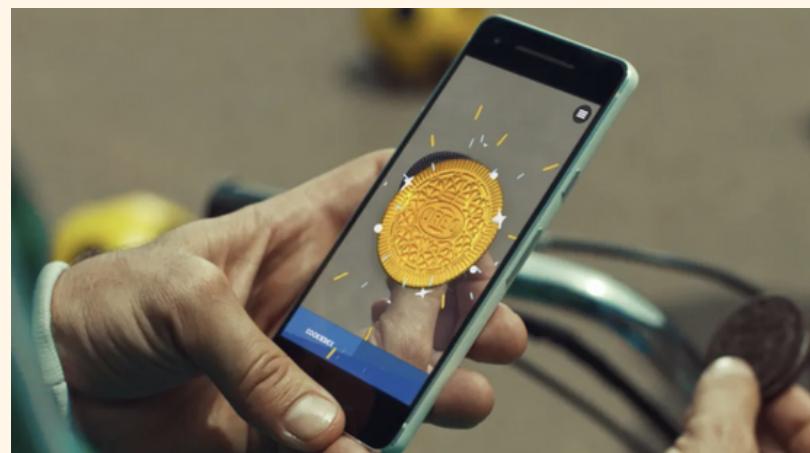
[https://drive.google.com/file/d/1\\_Oo6AXI7X1bSXBy9E3G0GT7ZV-TazaHCY/view?usp=sharing](https://drive.google.com/file/d/1_Oo6AXI7X1bSXBy9E3G0GT7ZV-TazaHCY/view?usp=sharing)

# Competitive Analysis

## The Great Oreo Cookie Quest



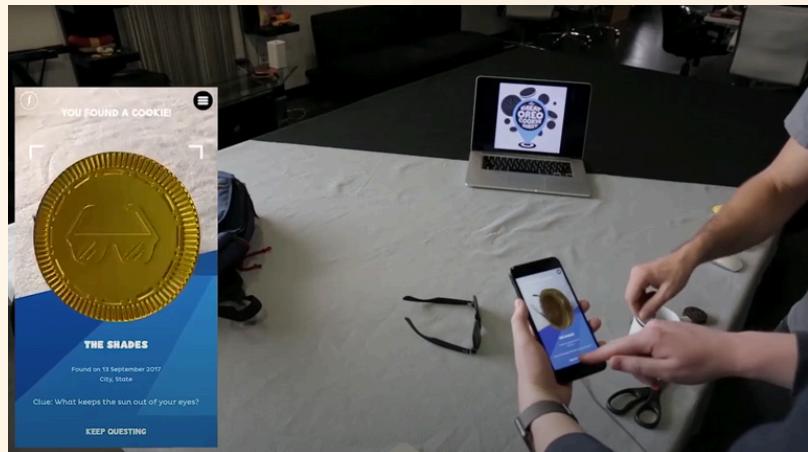
It is a mobile app that allows users to scan Oreos and everyday objects in an AR scavenger hunt. Users start by scanning an Oreo cookie, and from there they will be given a riddles with items as the answers. By scanning the item that answers the riddle, users will gain 3D cookies depending on the difficulty of the riddle. They will also get points that they can use to redeem prizes like stickers and phone wallpapers, and even Google Play Store vouchers.



## Advantages

### I. Scannable answers

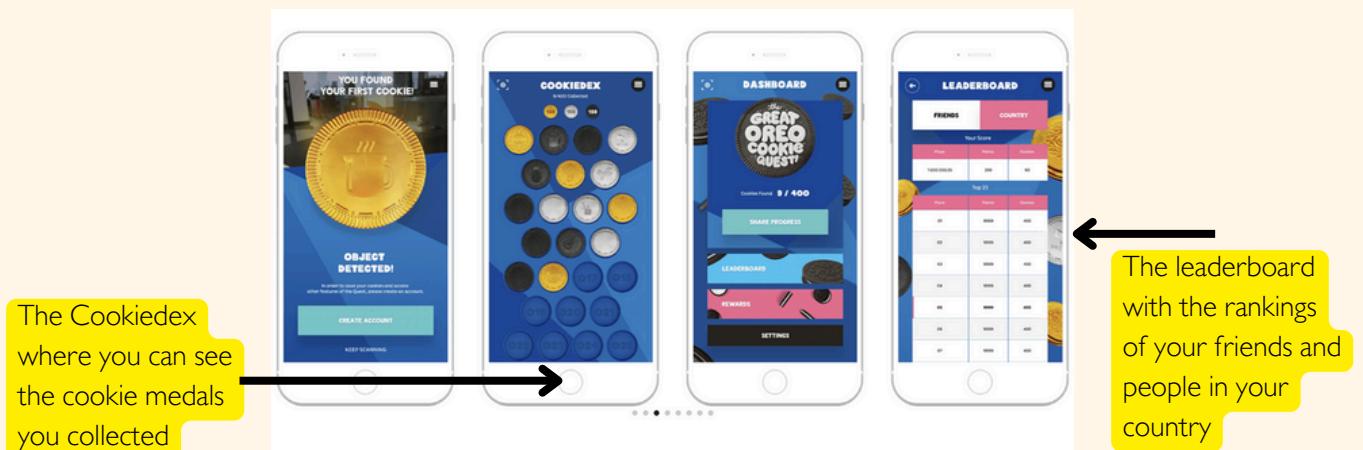
The app engages users by encouraging them to go out and find the items that answers the riddles. Allowing users to scan the answers to the riddles instead of typing them sparks a sense of curiosity and promotes thinking outside of the box to find the solutions.



User scans the sunglasses to get The Shades medal

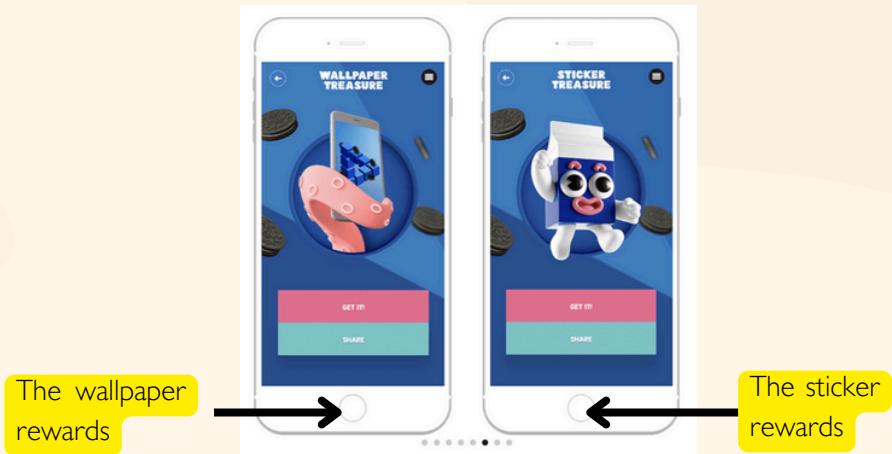
## 2. Collectable medals and leaderboard system

The Cookiedex which shows all your collected cookie medals and an in game leaderboard also encourages users to spend more time on the game and collect them all. The 3D models of unique cookie medals obtained with every solved riddle also motivates collectors to get all the different designs.



## 3. Collection rewards

The Great Oreo Cookie Quest also has rewards as an incentive for users to find all the 3D Oreo cookies. For every riddle you solve, you get digital stickers and wallpapers. By completing more riddles, you can even win Google Play Store vouchers, and compete in sweepstakes.



## **Disadvantages**

### **I. Limited gameplay**

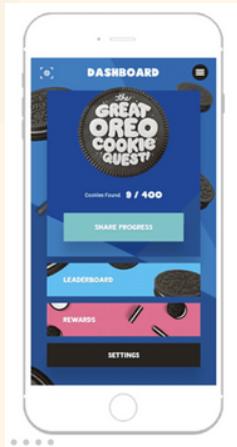
The Great Oreo Cookie Quest app was not intended to be a long term game, which is why it has a limited amount of medals to collect, and therefore, limited replayability. Once users get all the medals, they will stop playing as there is nothing else for them to do.



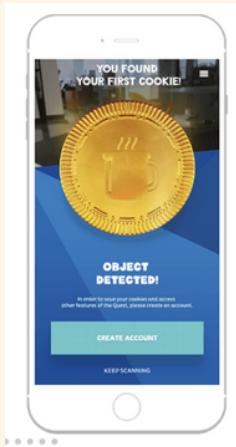
Only 400 medals  
for players to  
collect

### **2. Hard to read**

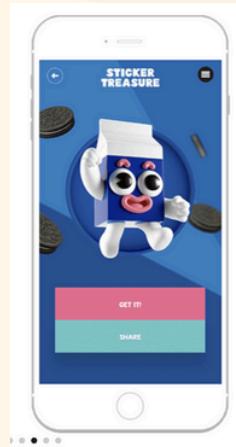
The choice of white font on light blue, light green and light red buttons make it harder to read the text. Certain font sizes used in the app also make it difficult for players to see. Using light red and light green buttons beside each other will also make it difficult for those with colorblindness to differentiate.



White font on a light background is harder to see



Some fonts are too small for users to read



Light red and light green is a combination that is hard for colorblind people to see

## NDP Jelan

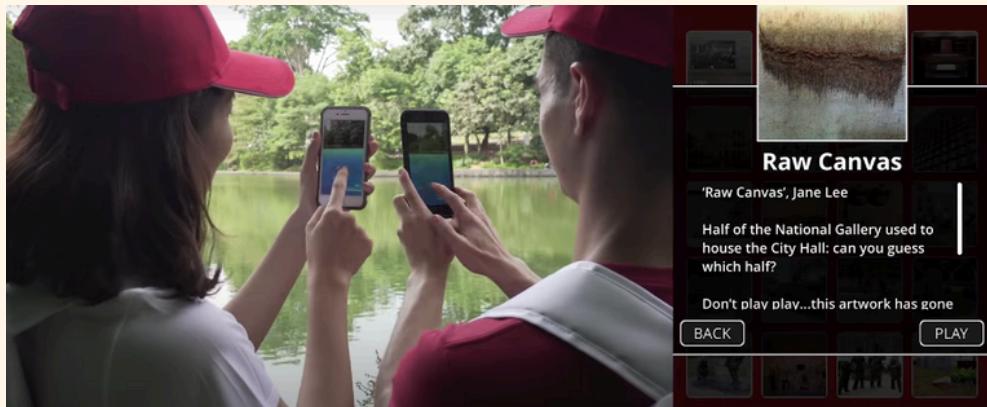


NDP Jelan is an app developed by National Day Parade (NDP) 2018 organising committee and SKY Optimum Technology. They developed this app for people of all ages to learn about Singapore's heritage and exciting parts on NDP 2018

Players can walk around Singapore doing trails to finish quests which will later bring rewards. The trails will be at places such as Botanic Gardens or the Civil District

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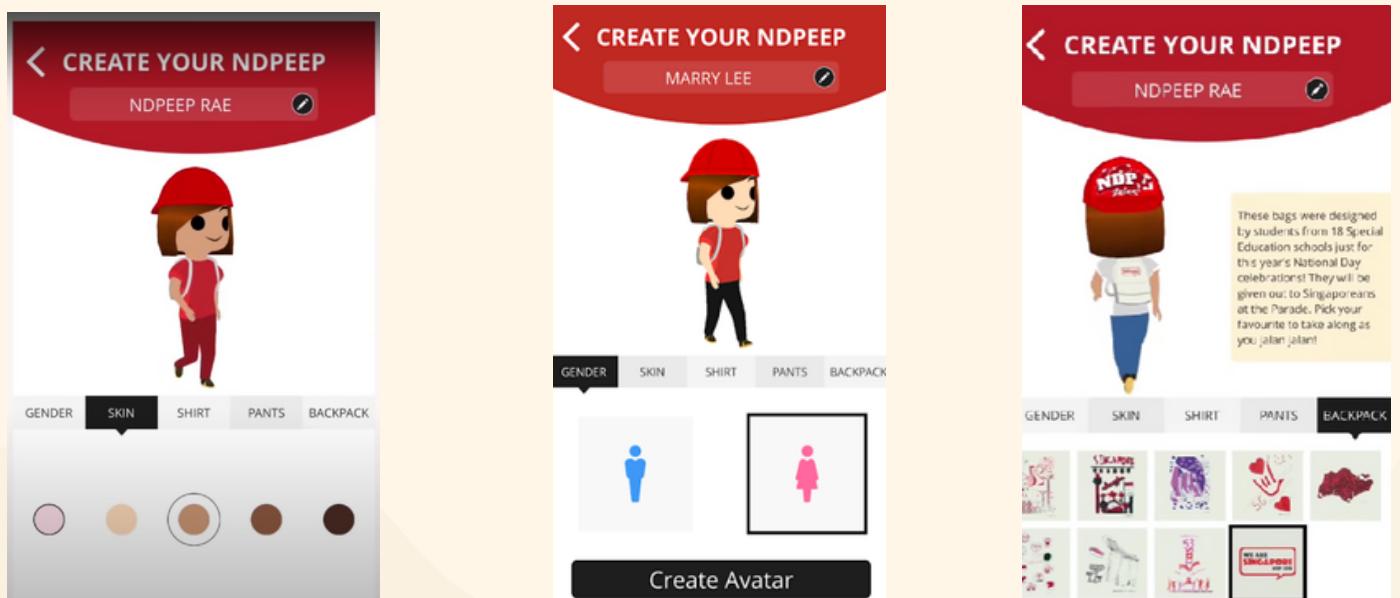


(NDpeeps, 2018)

## Advantages

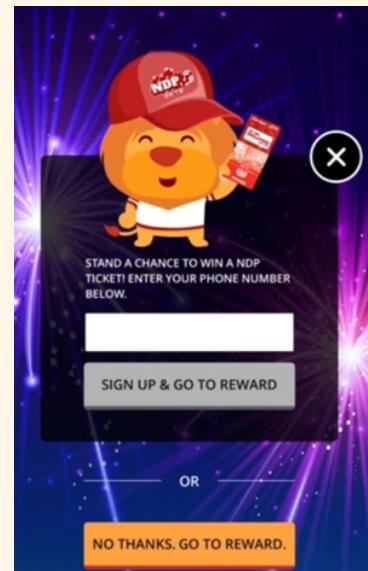
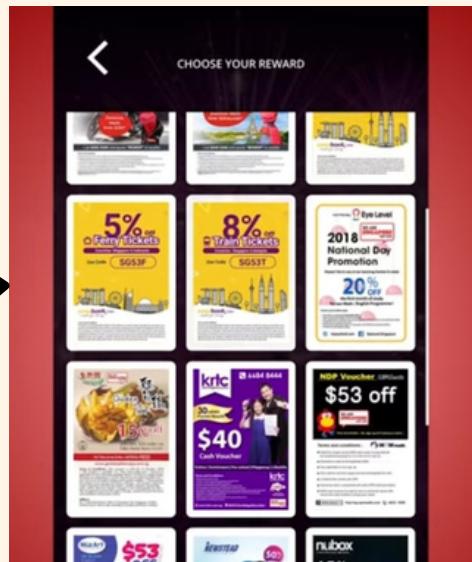
### I. Multiple customizable options

The app has customizable options for your character avatar, for example the skin color or bags, where you can make the character look more like any player who is trying the game, which also makes it diverse.



## 2. Insensitives for players to continue playing

There are real prizes to win if players finish all the quests, the most premium prize was a NDP2018 ticket, or they can even be “rewarded with discount vouchers” (Govtech, 2018), making an incentive for players to travel around Singapore, to appreciate its heritage culture and locations and to continue playing the app for longer periods of time



## 3. App is colorblind friendly

The app is quite colorblind friendly making it more accessible for those who are color blind

**Original:**



**Simulated:**



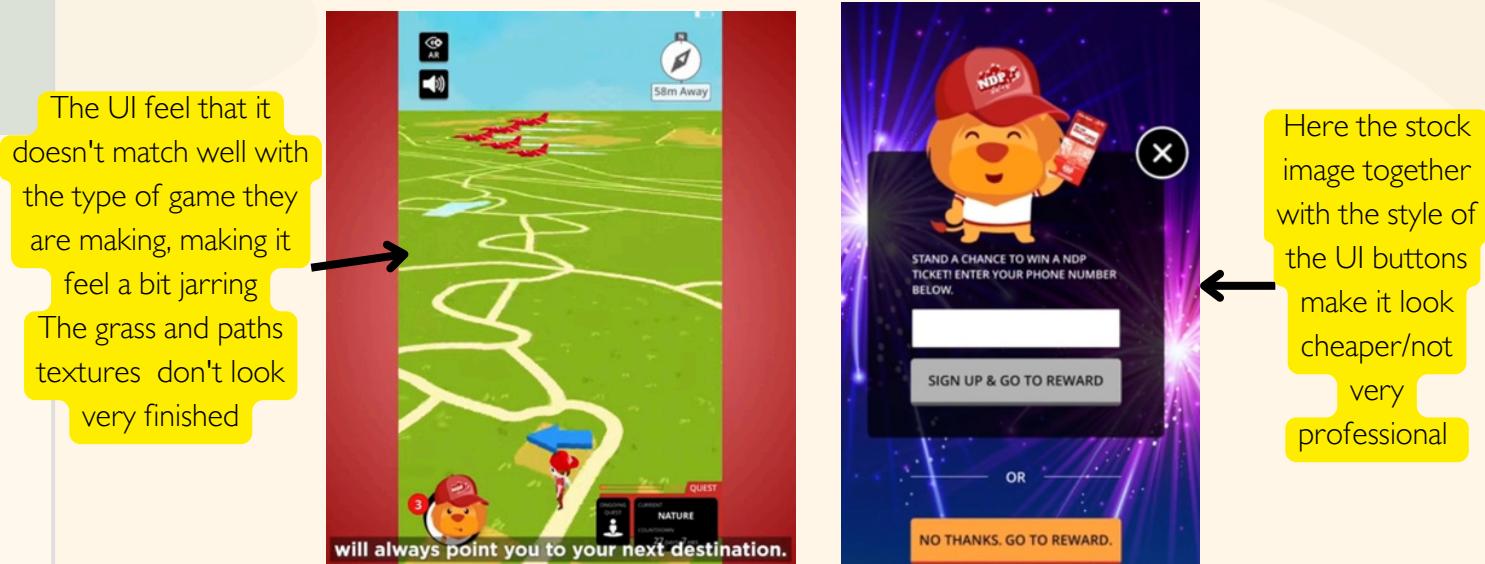
## Disadvantages

### I. Lacking some parts of customising

They lack the option of customising the hair style for the character, and hats which leaves less options to customize the character with

## 2. UI and overall look of the app is not well done

The app visually doesn't look very finished or professional looking, as some of the UI doesn't seem to match the artstyle and the textures and some UI does not look finished or look professional



## 3. Some words are hard to read in this app

Some text due to font or size are hard to see in some instances. This is not a good thing since it makes certain phrases hard to read especially for those who are visually impaired or have visual disabilities like one of our members of the team



## Angry Birds AR: Isle of Pigs



Angry Birds AR: Isle of Pigs is a free mobile game with in-app purchases developed by Rovio Entertainment Oyj for ages 9 and above.

Users are able to simulate the stages in real life by placing down 3D models of the Green Pigs' Fortresses on any surface by simply tapping on the screen while the camera is facing a flat surface. Users can then shoot down the Fortresses using the Angry Birds as ammunition and gain points and coins to unlock new stages.



## **Advantages:**

### **I. Visuals to guide the user**

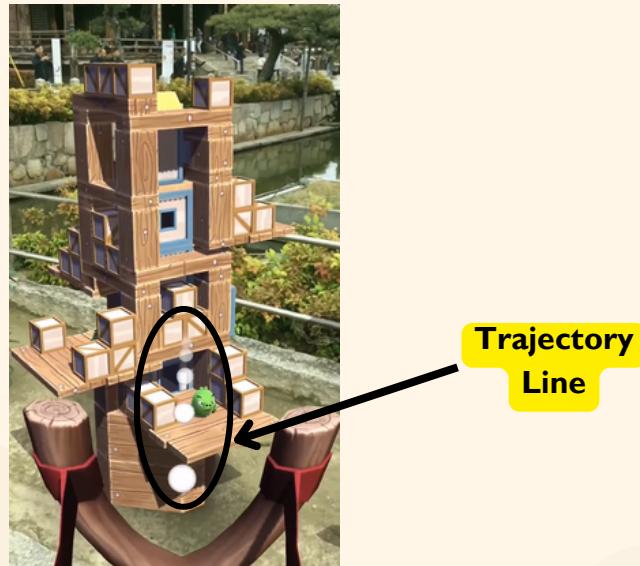
The game has a meter to tell the user whether the stage/level can be placed. The game makes use of the device's camera to determine whether the location captured by the camera is suitable for the stage/level to be placed.

Green means the location is suitable and thus the stage/level can be placed, orange/yellow means location is not very suitable but can still be placed, and the meter is replaced with a red sign that does not allow the user to place the stage/level.



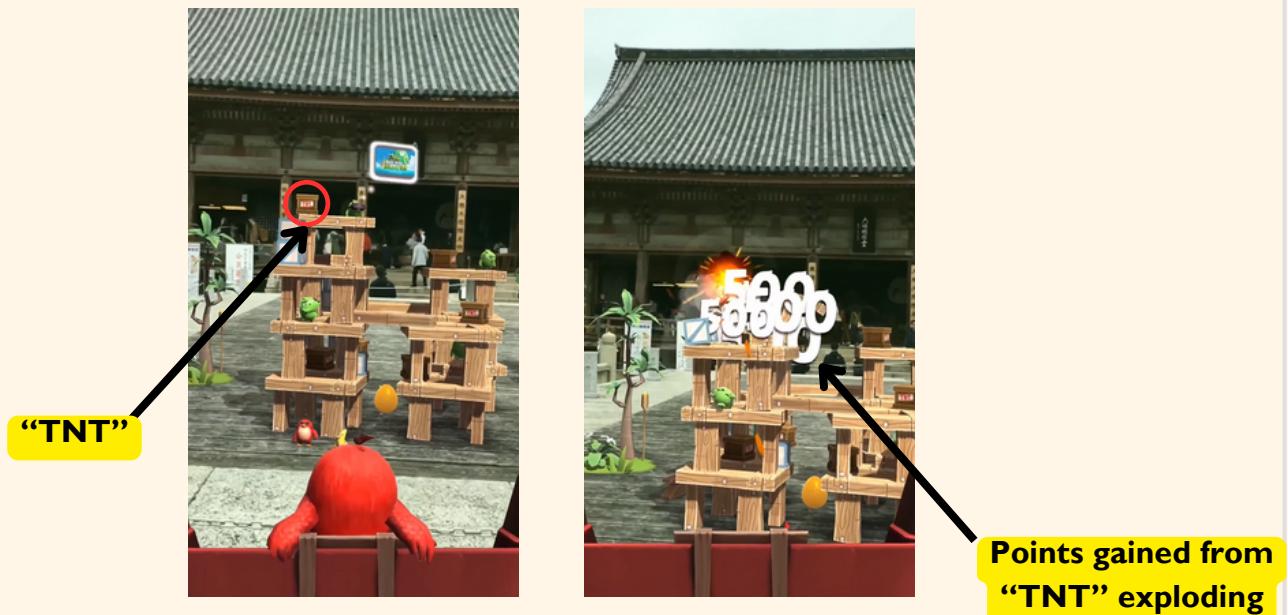
**Meter bar**

A trajectory line is also present when aiming to shoot at the Fortresses. This helps to guide the user in aiming the Angry Birds to shoot down the Fortresses and clear the stage/level.



## 2. Different variety of stages and characters

Each stage has its own unique Fortresses built in different positions with special parts that help to clear the stage/level easier. For example, there are “TNT”s in some stages that explode when hit, which gives points and destroy some of the parts in the Fortress. Users can use that to their advantage to plan how to clear the stage easily.



## **Disadvantages:**

### **I. Repetitive gameplay**

Despite the multiple stages with a variety of structures and different kinds of Angry Birds to play with, the simple gameplay of just launching the Angry Birds at the structures become repetitive and dull. This results in a low return rate as the users will get bored easily and will not be motivated to return to the game.

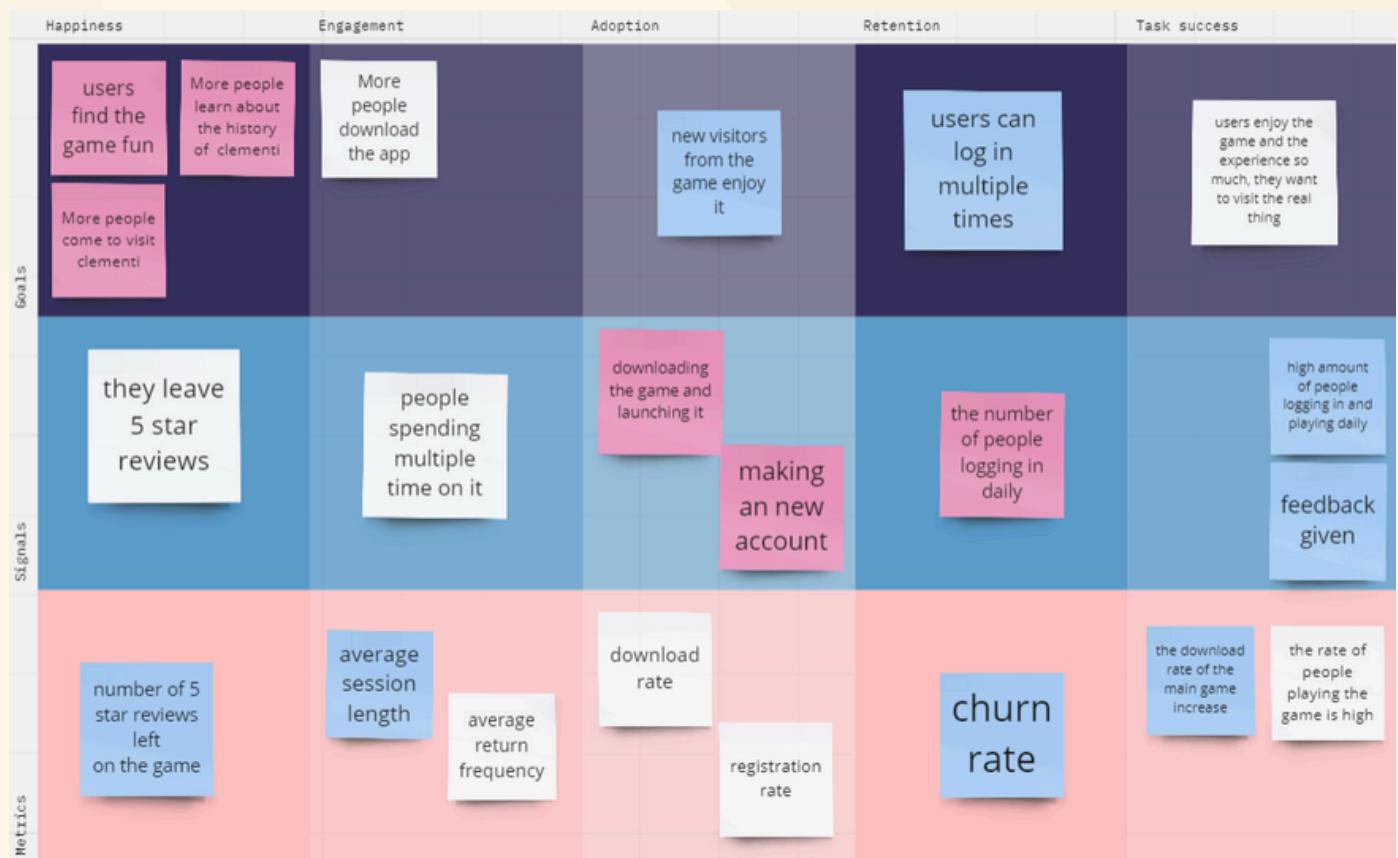


**There's only so much you  
can do with only launching  
at objects**

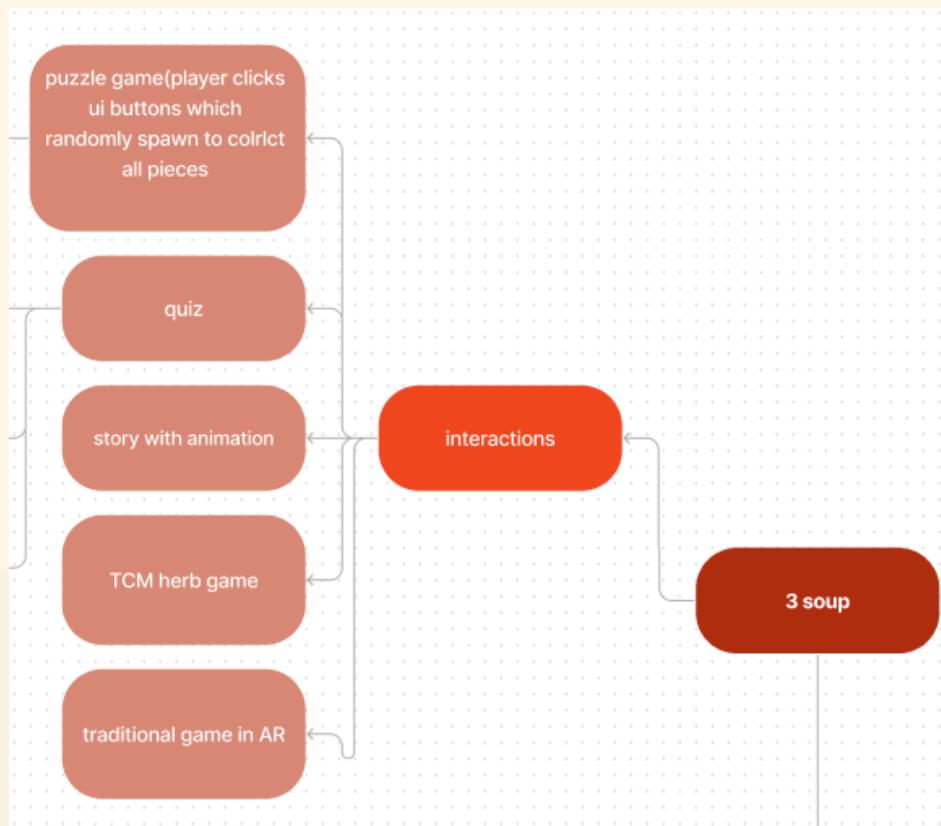
## Compilation of advantages, disadvantages

App	Advantage	Disadvantage
The Great Oreo Cookie Quest	<ul style="list-style-type: none"> <li>• <b>Scannable answers</b></li> <li>• <b>Collectable medals and leaderboard system</b></li> <li>• <b>Collection rewards</b></li> </ul>	<ul style="list-style-type: none"> <li>• <b>Limited gameplay</b></li> <li>• <b>Hard to read</b></li> </ul>
NDP Jalan	<ul style="list-style-type: none"> <li>• <b>Multiple customizable options making it more inclusive</b></li> <li>• <b>Insensitives for players to continue playing</b></li> <li>• <b>App is colorblind friendly</b></li> </ul>	<ul style="list-style-type: none"> <li>• <b>Lacking some parts of customizing</b></li> <li>• <b>Insensitives for players to continue playing</b></li> <li>• <b>Some words are hard to read in this app</b></li> </ul>
Angry Birds AR: Isle of Pigs	<ul style="list-style-type: none"> <li>• <b>Visuals to guide user</b></li> <li>• <b>Different variety of stages and characters</b></li> </ul>	<ul style="list-style-type: none"> <li>• <b>Repetitive gameplay</b></li> </ul>

# HEART Map



# Mind map



# Persona

My persona is Charmaine Lee. She loves playing games, is interested in new technology aspects like AR and used to live at Clementi for her whole life but moved to Australia a year ago, however, she will be coming back to visit Singapore in a couple months and wants to revisit her favourite local businesses and landmarks. She also colorblind and struggles at times playing certain games since some are not colorblind friendly, so she would love to have a game which is color blind friendly

## Charmaine Lee

Student

Age: 18

Student

### Personal Traits

Patience ▼65%

Flexibility ▼60%

Problem-solving ▼70%

### Bio

Charmaine is a student studying Cybersecurity in Australia. She loves games and used to live at Clementi all her life but moved a year ago

### Needs

▶ A game which is colorblind friendly

▶ A game which shows stores which she patroned at when she used to live at Clementi

### Frustrations

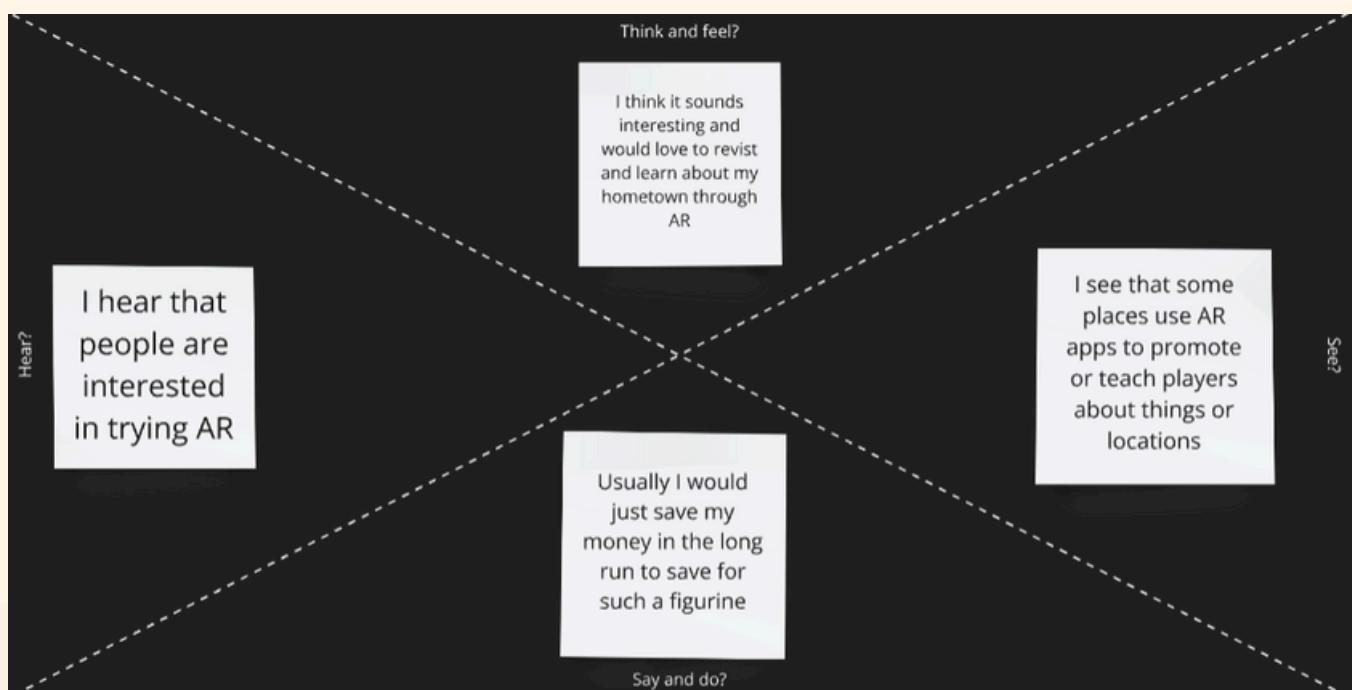
▶ Due to her colorblindness, she at times struggles playing certain games

▶ She misses going to Clementi but does not have a motivation to visit some local business or places

### Free Time

During her free time she likes to play games and look into local businesses

## Empathy Map



Pain

I am colorblind so I might struggle playing some apps

Gain

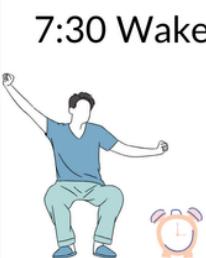
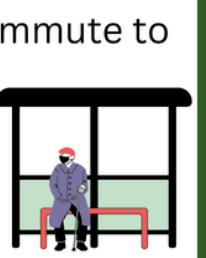
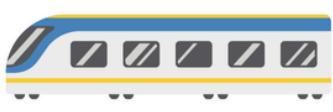
I can revisit my favourite places of Clementi again

I can learn and play games related to some stops

I can visit and learn about places I did not know or was familiar with

I'm interested in technology and I am excited to try an AR app

# Day in a life of a student who used to live in Clementi, and loves playing games

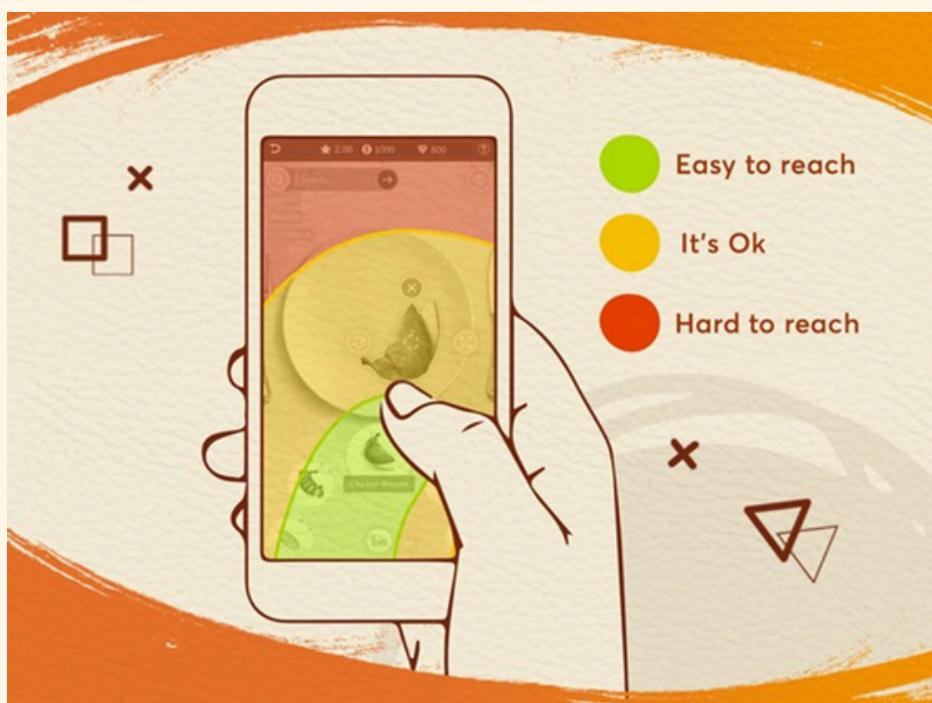
7:30 Wakeup 	8:25 commute to school 	9:30 start school class 
12:00 Lunch ( would sometimes look into any new local buisnesses ) 	13:30 return to class 	17:30 commute home 
18:10 takes the naturalistic route from the from the train station to her home 	18:25 reaches home takes a shower 	19:00 eat dinner 
19:50 does her school work 	22:00 will take a break, either by playing games, or looking into new tech 	
20:30 Rest, play games watch videos 	00:00 Sleep 	

# Things to note before designing for mobile apps

## Optimizing UI placement

They should be in areas where it is easy to see and where users would not have a hard time knowing where they are. It is also recommended that the size of the target should be about 10x10mm, to reduce the likelihood of a misclick.

Additionally, it is important to know where some areas are easy or hard to reach, so most commonly used areas should be placed on the bottom side of the phone and harder to reach spots on the top of the phone



(PUNCHev Group, 2023)

## Opting for minimalism for adding functions

Player's dislike having a screen with multiple features, text, options, and buttons everywhere as it can be messy and hard to navigate, thus they need to be minimized, neat and simple to see

## **Aim for simplicity**

Make the UI as simple but easy to understand as much as possible to make it more accessible and easier to focus on what is the goal or what the player wants to do.

## **Be consistent**

Consistency creates a sense of familiarity for players, improving players' overall experience. Consistency can be from use of font, colors, style and icons.

The lack of consistency can make players confused at times questioning why it looks weird or different from the rest.

## **Building a suitable ambience**

Ambiance must match the target players. "The ambiance is, in other words, the audiovisual of your game." (Oentoro, 2022). Thus, why visuals must match target players preferences. Therefore, building a great ambiance is based on the genre of the game

## **Things to note when making UI for those who are color blind**

Why do we want to focus on making our app inclusive to those who are colorblind? It is because colors are very important in conveying a message when it comes to UI/UX design, however there are 300 million people in the world (8% of the worlds population are color blind ) (ClintonEye, n.d.). If we do not keep colorblindness in mind when designing, we could loose out 300million people from playing our app, due to having difficulties not being able to see things cleary or accurately and will lead to motivating less people in visiting Botanic Gardens, which is our target goal.

Thus when designing our UI, we must make sure that the methods and colors used, do not limit people with color blindness from being able to play our game.

## Utilize symbols and labels

You should not rely on colors to indicate difference, an error or information in UI, because if people are unable to tell the difference between the colors due to their color blindness, they may be prevented from telling important details or cues based on color

For example, looking at Facebook's sign up page, if color is the only identifier, it will look like this ( red-blind ). It is hard to tell that there is an error in signing up and may cause frustrations to the color blind user

The image shows two versions of the Facebook 'Create an account' form side-by-side. Both versions have a blue header with the word 'facebook' and a dark blue footer with a green 'Sign Up' button.

**Left Version (Color-Coded Validation):**

- Header: 'Email or Phone' input field, 'Password' input field, 'Log In' button, 'Forgot account?' link.
- Text: 'Facebook helps you connect and share with the people in your life.'
- Form:
  - 'Create an account' section: 'It's free and always will be.'
  - 'First name' input field (red border)
  - 'Surname' input field (red border)
  - 'Mobile number or email address' input field (red border)
  - 'New password' input field
  - 'Birthday' date picker: '10 • Aug • 1993' (red border)
  - 'Female' radio button (yellow outline)
  - 'Male' radio button (yellow outline)
  - Small text: 'By clicking Sign Up, you agree to our Terms, Data Policy and Cookie Policy. You may receive SMS notifications from us and can opt out at any time.'
- Footer: 'Sign Up' button.

**Right Version (Symbols and Labels):**

- Header: 'Email or Phone' input field, 'Password' input field, 'Log In' button, 'Forgot account?' link.
- Text: 'Facebook helps you connect and share with the people in your life.'
- Form:
  - 'Create an account' section: 'It's free and always will be.'
  - 'First name' input field (bordered with a thin black line)
  - 'Surname' input field (bordered with a thin black line)
  - 'Mobile number or email address' input field (bordered with a thin black line)
  - 'New password' input field
  - 'Birthday' date picker: '10 • Aug • 1993'
  - 'Female' radio button (bordered with a thin black line)
  - 'Male' radio button (bordered with a thin black line)
  - Small text: 'By clicking Sign Up, you agree to our Terms, Data Policy and Cookie Policy. You may receive SMS notifications from us and can opt out at any time.'
- Footer: 'Sign Up' button.

However when using symbols and having error messages pop up, it is much more easier to tell that there is an error in signing up the new user

The image shows two versions of the Facebook 'Create an account' form side-by-side, similar to the previous one but with validation error messages displayed as red boxes with exclamation marks.

**Left Version:**

- Header: 'Email or Phone' input field, 'Password' input field, 'Log In' button, 'Forgot account?' link.
- Text: 'Facebook helps you connect and share with the people in your life.'
- Form:
  - 'Create an account' section: 'It's free and always will be.'
  - 'First name' input field (red border with exclamation mark)
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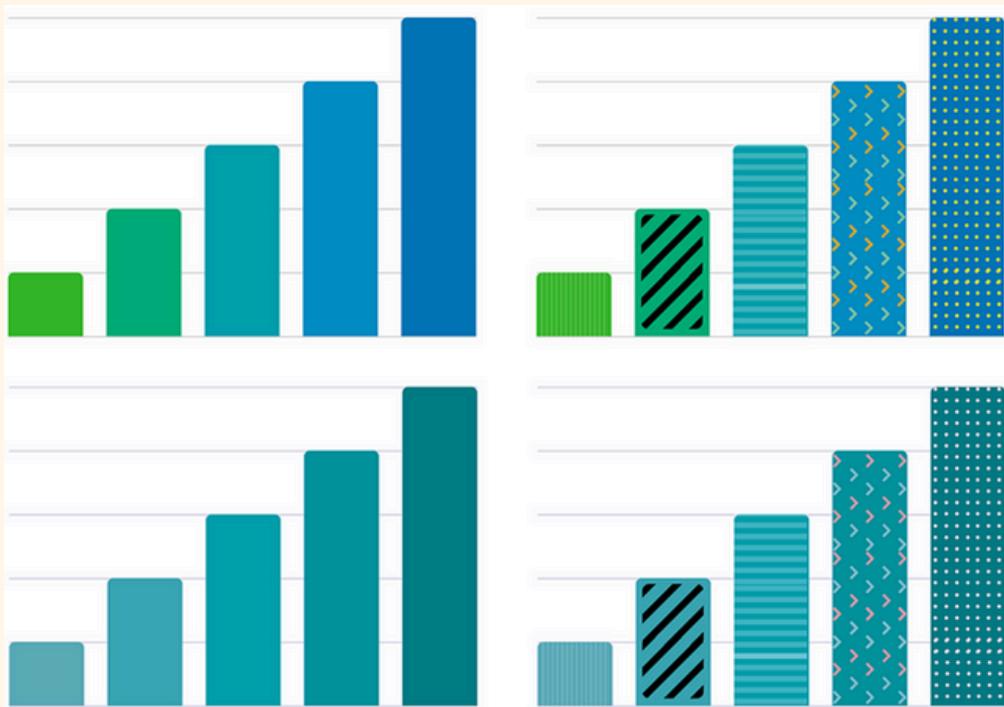
(Staats, n.d.)

## **Consider minimalism**

Minimalism usually does not use that much colors, this means that the lesser colors, the less chance for confusion. (Payne, 2020)

## **Using patterns and textures**

One easy way to distinguish two items from one another is to use patterns and textures. If users are unable to differentiate colors, they will still be able to tell the difference with the use of patterns and textures. In this bar chart, for example, it is easier to tell the difference due to the patterns on the bars, rather than using the colors of the bars to differentiate things



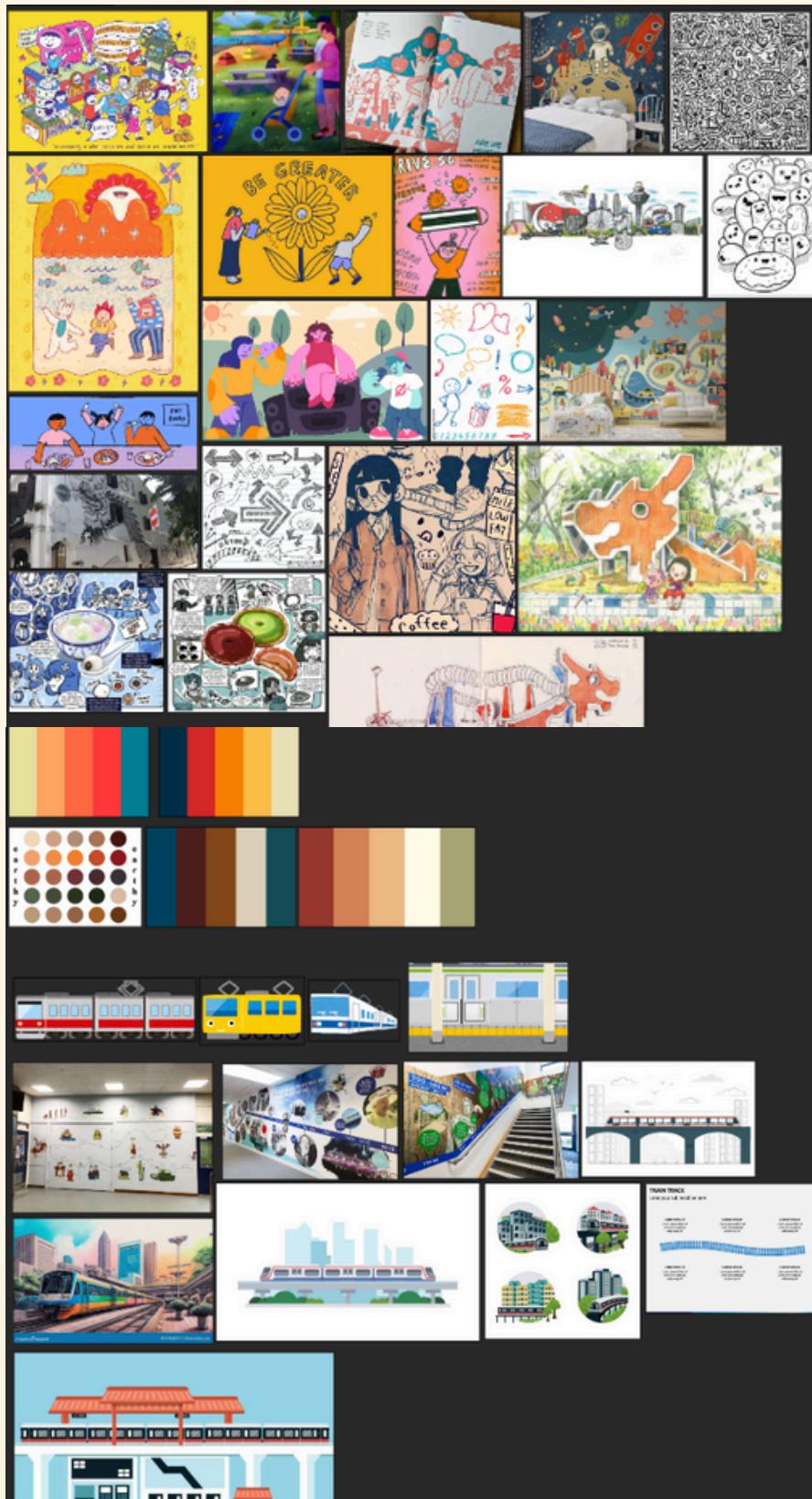
(Shaffer, 2016)

## **Using patterns and textures**

- green-red
- green-blue
- green-brown
- green-black
- green-grey
- blue-grey
- light green-yellow
- blue-purple

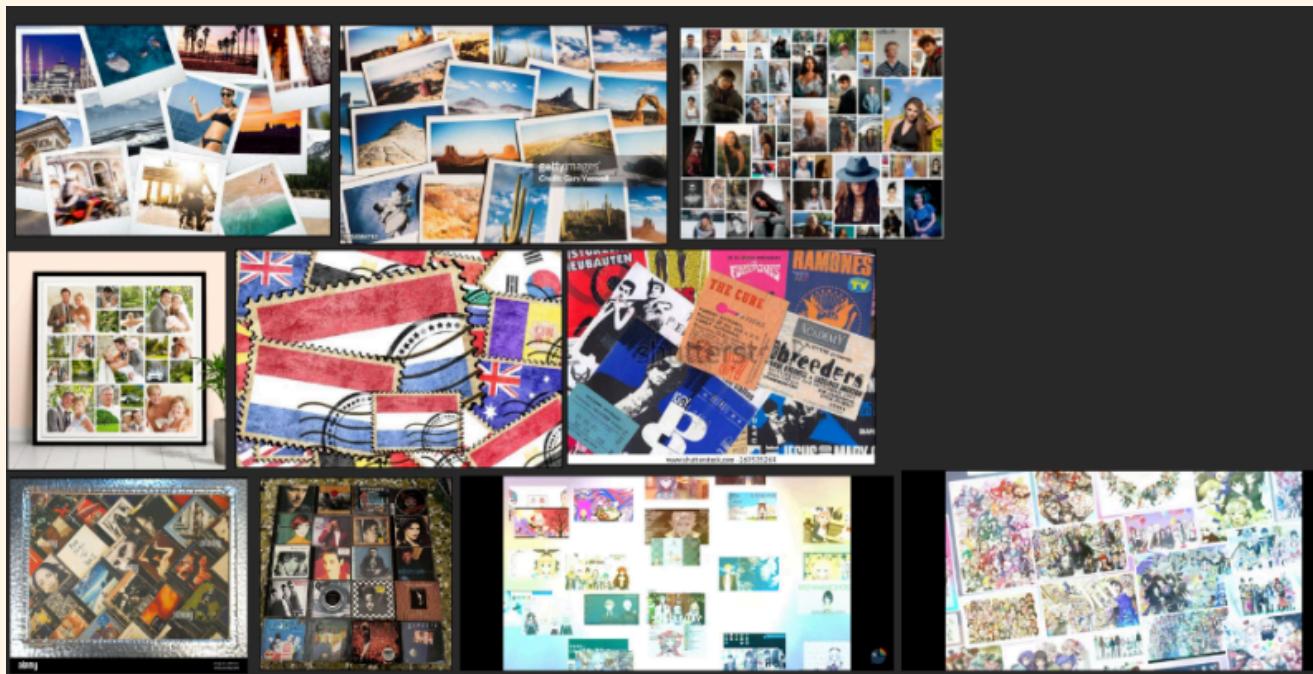
## Reference images

These are initial reference images for our idea of the style and colors of the game



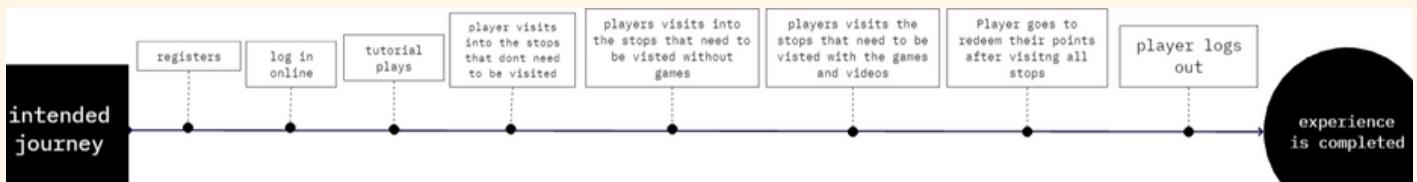
## Reference images

These are initial reference images for our idea of the style and colors of the game



## Initial Userflow

This is our Initial Userflow before development



# Design rationale

## Font Choice

We chose the font. The reason why we chose this font is that it fits the look and feel of our game, is easy to read, and is also inclusive for those who are dyslexic and visually impaired. As looking from a website on how to design elements accessible, the font just includes “good height, width, and thickness” (uncg, n.d.), and “fairly popular and available to most users. Fonts on the “Highly Recommended” list are considered among the highest-rated with regard to readability, legibility, and availability.”(uncg, n.d.). This font fits the criteria of having “good height, width, and thickness” (uncg, n.d.) has been downloaded multiple times and is also designed with children in mind, ensuring it is easy for people to read. This not only aligns with our target audience but also demonstrates that it is suitable for beginners or those who find reading challenging



Additionally we have a member on the team with convergence insufficiency and oculomotor dysfunction, and they have stated that this font makes it easier for them to read the text.

We want as many people to play our game as possible to promote JourneyX and Clementi, thus why we are trying to make it as inclusive as possible for everyone, through our font choices

## UI

Our stakeholder created the UI however our team members, had to consult and teach them how to create the UI to be colourblind-friendly and how to make it friendly for those who are visually impaired. We tested this UI with our persona who stated she had no issues with navigating the app, and have placed it through a color-blind simulator to check as well and it shows no issues

### Red-Blind



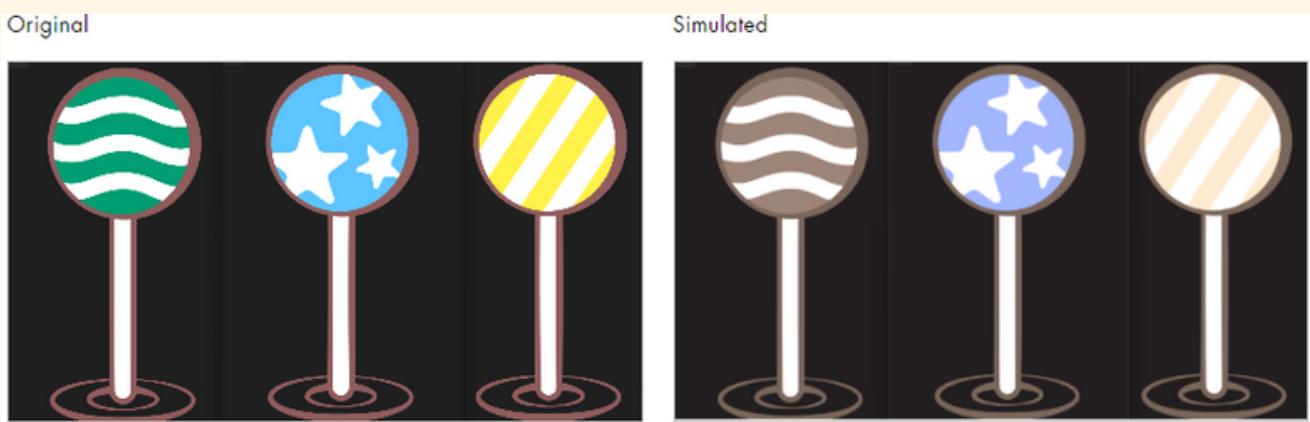
### Green-Blind



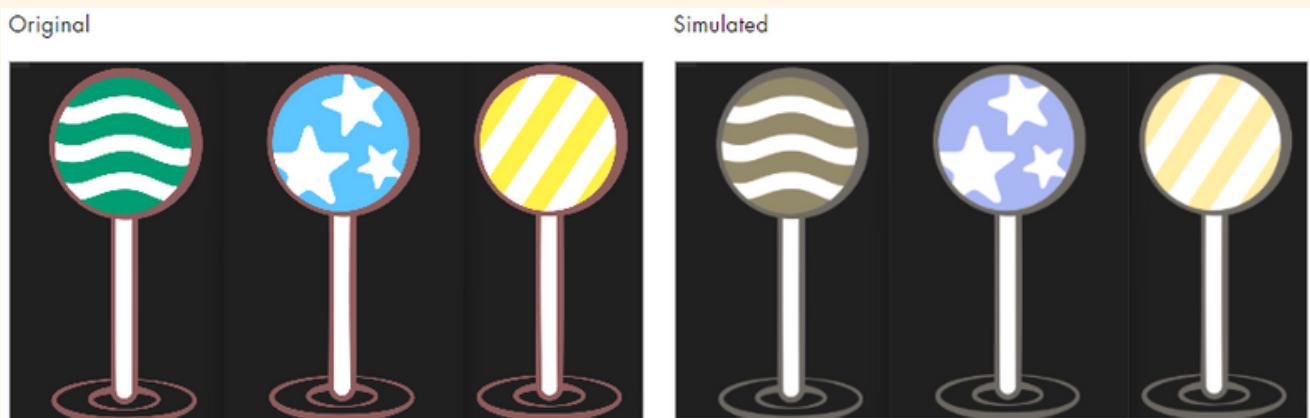
## UI

We also have different stops players have, differing by colour and pattern. The reason we used patterns to help differentiate the stops is to make them friendly for those who are visually impaired, as shown in the research above about designing UI for the colourblind, it states that UI cannot rely on colour, and one way to help differentiate it is using patterns and textures

### Green-Blind



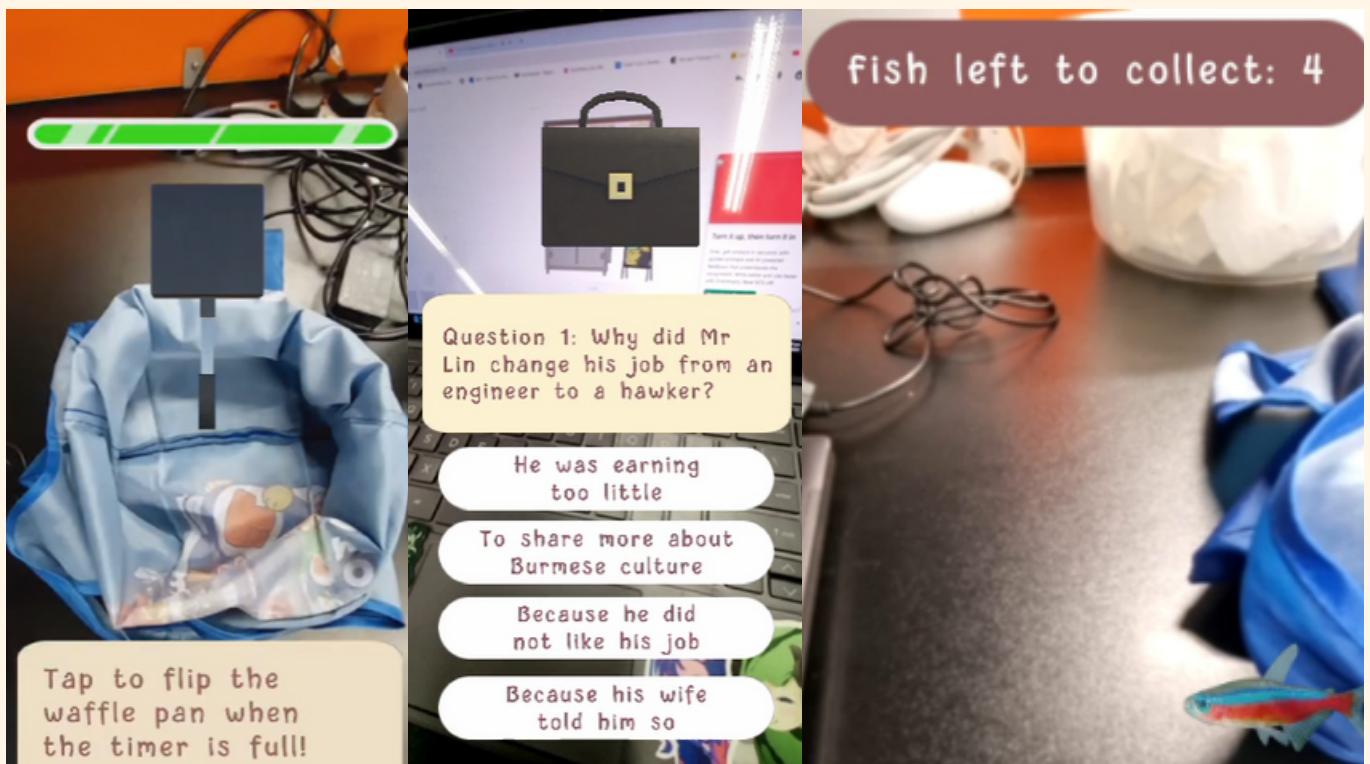
### Red-Blind



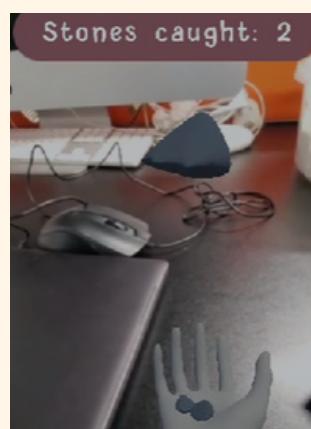
## UI

The color of the text with Adequate Color Contrast in mind as “Adequate color contrast enables learners to process visual information in text and images by distinguishing items from one another. Good color contrast reduces cognitive strain and confusion and makes designs easier to understand. Poor color contrast can make text hard or impossible to read.”(uncg, n.d.) and it will help those “ who have low vision, color blindness, visual stress, dyslexia, presbyopia (changes to vision that normally accompany aging), and other conditions.”(uncg, n.d.)

### Examples of color contrast text



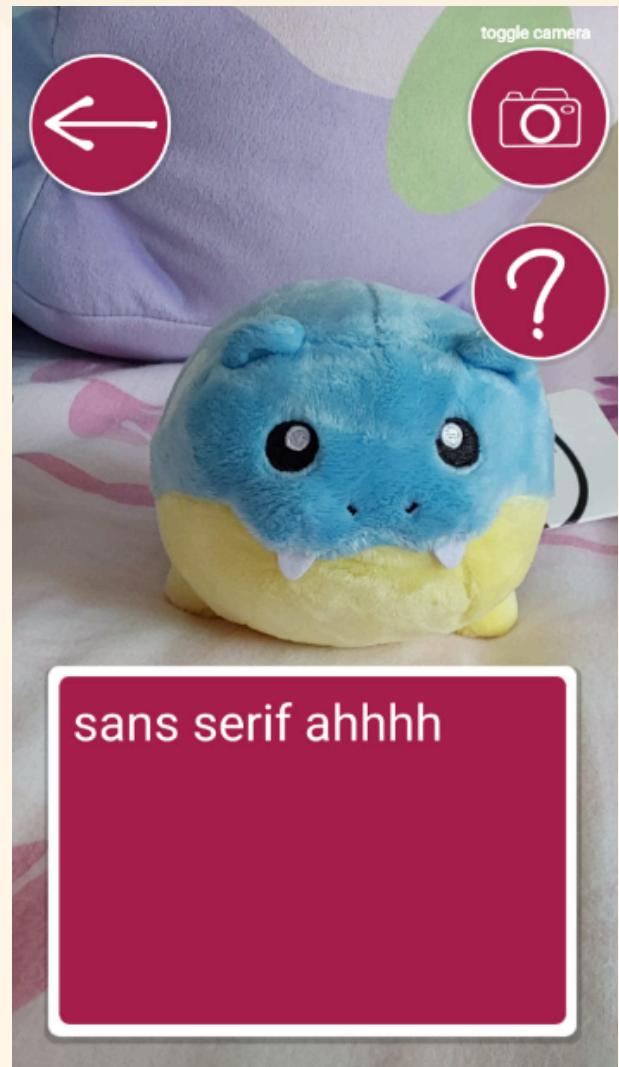
Additionally most of the UI in game are red as “Red is a powerful colour. It is very stimulating, attracts attention and increases brain activity.” (Zioxi, n.d.) However red can be “too stimulating” (Zioxi, n.d.), thus toned down in intensity and use it sparingly in some areas



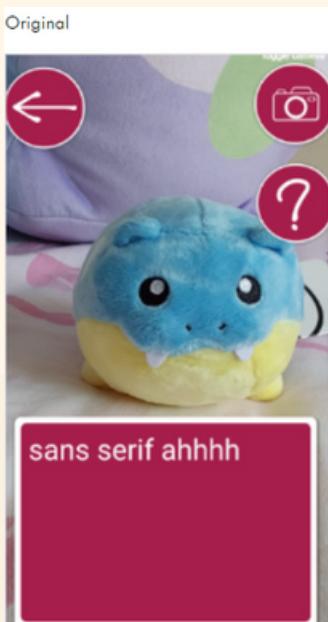
## UI

Originally a team member, Grace Foo had designed a set of UI to be used in the AR portions of the game, however it was unused.

It had a big set of buttons so it is easy to see for people who have visual impairments, used sans-serif as in this article relating to fonts for those with dyslexia, it states to "Use sans serif fonts" (bdadyslexia, n.d.) and another article talking about fonts for people with visual impairments, stating "The goal is to use easily recognizable characters such as Arial, Verdana, Tahoma and Sans Serif versions of any typeface are often more legible" (Willings, n.d.), used a slightly sketchy style to fit what the original stakeholders tried to suggest and this certain red color is used, as not only red is an educational color, but I used the red from the stakeholder's prototype and made it brighter, this is because when players are playing it under the sun, the screen is darker and harder to see, thus I made the UI bright and easy to see. There is also a white border and a shadow to help contrast against the background and to make it easier to see. Additionally this set of UI is color blind friendly



### Red-Blind



### Green-Blind



# **Game Design Segment**

## **Game Overview**

Players will visit 16 stops to explore and learn about Clementi's heritage, landmarks, and local businesses. 6 stops can be looked at any time anywhere, the next 10 stops need to be visited physically and to scan an image to access the stop's information. 5 stops will contain basic information, while the other 5 will contain a special video and an AR mini game.

## **Platform Minimum Requirements**

Using WebGL, players with any device will be able to play our game, through a website.

## **Synopsis**

Players will explore different parts of Clementi and learn about those parts. Some stops will also have videos to watch or AR Mini games to play.

## **Game Rules**

Players will explore different parts of Clementi and learn about those parts. Some stops will also have videos to watch or AR Mini games to play.

## **General Rules**

10 of the stops have to be physically visited to scan the images to get the information of each stop.

## **Interaction Rules**

- For the Quiz, players have to answer 3 questions correctly,
- For the AR 5 Stone game, players must start from one stone. After catching the first one they have to catch two, then three, four and five and they must not drop any stone or else they have to restart from the first stone

# **Game Design Segment**

## **Interaction Rules**

- For the fish game, they have to catch all 4 fishes and then sort the fishes to the correct tanks
- For the TCM game, players must prepare the herbs accordingly to the instructions
- For the waffle game, players must cook waffles without burning them and then decorate them

## **Game Structure**

Only 6 stops can be accessed anywhere without being at that location physically. They have basic information about that location

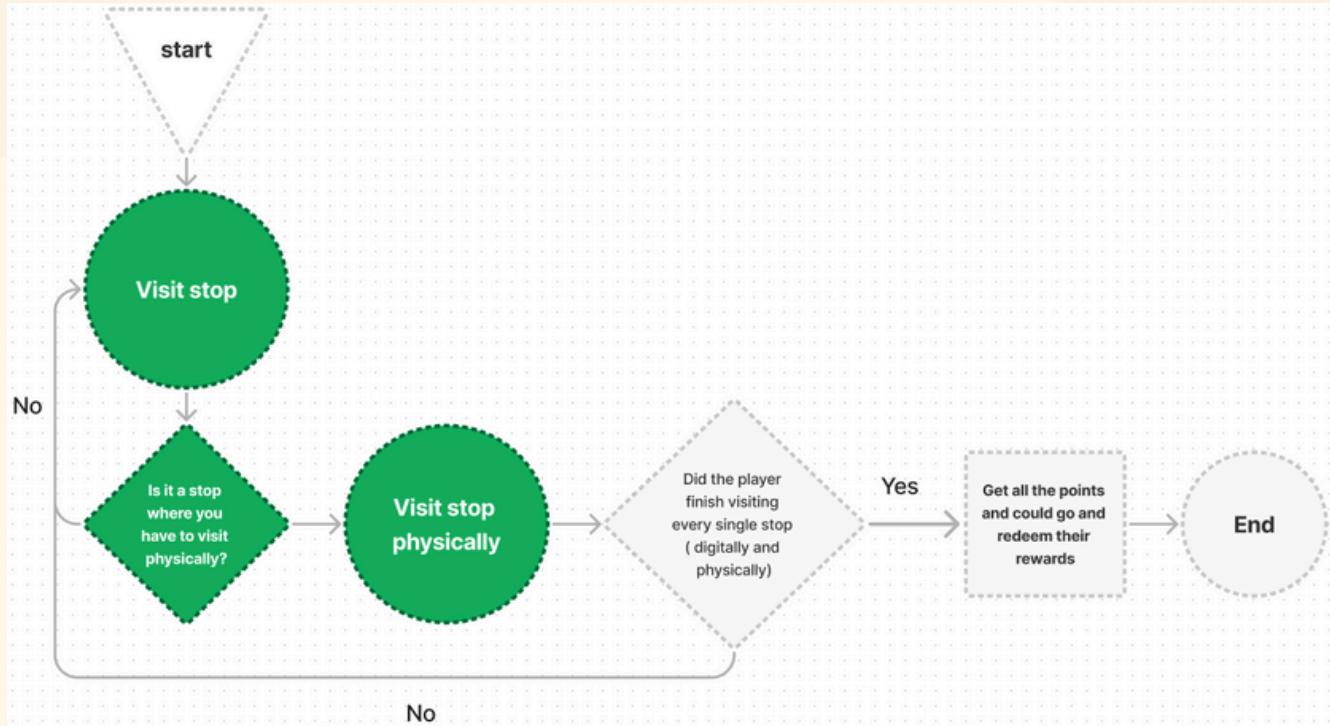
5 stops have to be visited physically, they have more detailed information about the location being visited. They can access this by scanning an image

5 stops have detailed information, video documentation and a AR mini-game unique to each location

1. Clementi 328, a level where you catch fish for the fish shop owners and sort them to the correct tanks
2. Wafflehouse is a level where you cook and prepare a waffle order
3. Little Myanmar is a level where you learn about this store through the video documentary and then do a quiz with interactable 3D models relating to the questions
4. FujianTCM is a level where their placed in the TCM where they need to prepare the herbs according to the instructions
5. Fong Dee Chicken Curry Puff is a level where players eat a AR curry puff, feel “nostalgic” and remembers a time where back in the day, people would eat this when their little and play AR 5 stones

# Game Design Segment

## Core Gameplay Loop



## Game Controls

- For the 5 stones game, players must move the hand to catch the stones
- For the quiz, players can drag around the models
- Players must drag the fish so that it can return to their tanks
- For the TCM game, tap to spawn the room, look around room to find herbs, combine herbs to make medicine
- Waffle steps:
  - 1. Pour batter in waffle maker
  - 2. Close waffle maker
  - 3. UI timer -> when full, flip button appears
  - 4. Tap flip button to flip the waffle maker
  - 5. UI timer -> when full, serve button appears
  - 6. Tap serve button to put the waffle on a plate
  - 7. UI says: done cooking, put toppings, tap ok to cancel
  - 8. 3 UI buttons (screen space) appear -> butter (container), syrup (container), ice cream (on waffle) -> UI buttons appear, tap to add, tap again to cancel
  - 9. Tap done button below to finish decorating

# **Game Design Segment**

## **Level Design and Setting**

The setting of the games are based on the real life locations of the stops  
They are:

### **(Stops they need to visit physically with a video documentary and AR mini game)**

1. Fong's Dee Special Chicken Curry Puff (I will get in contact with them today)
2. Clementi 328
3. Little Myanmar
4. Fujian TCM
5. Waffletown

### **( Stops they need to visit physically with detailed information and images )**

1. Clementi Mall
2. KTM Playground at Block 209
3. Clementine Town Centre water drop fountain
4. Clementi woods park
5. Clementi MRT

### **( Stops with basic information and a picture )**

1. Clementi forest
2. Clementi Arcade
3. Masjid Darussalam
4. Wu Tai Shan
5. Singapore Buddhist Youth Mission
6. Church of the Holy Cross

File of Scannables:  
<https://drive.google.com/drive/folders/1eBjWdmleHYpFXmcu76SghVKXbSOHSVF3?usp=sharing>

## Clementi 328



Clementi 328 is where the fish game will occur

The fish game will look like this, in this section they are sorting the fish



The picture for this place to scan is this

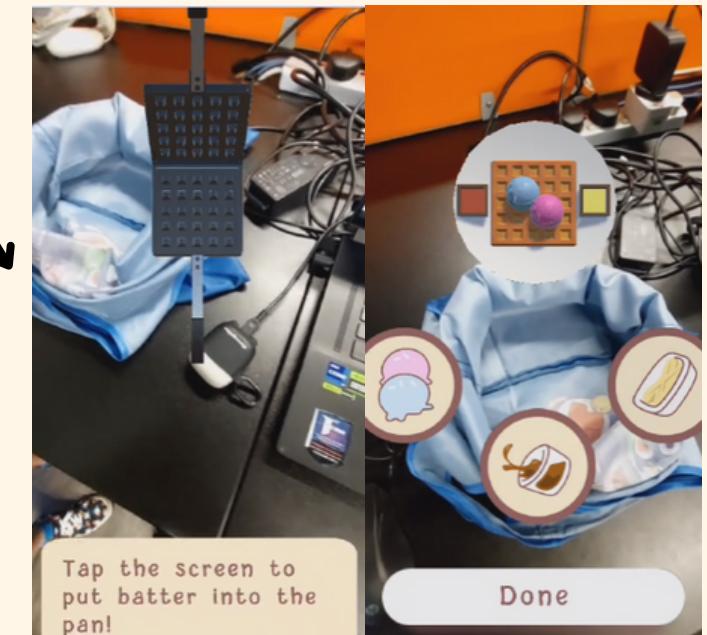


# Waffletown



Waffletown is where the waffle cooking game will occur

The waffletown game will look like this, where the player is cooking it



The picture for this place to scan is this

# Fong Dee Chicken Curry Puff



Fong Dee Chicken Curry Puff is where the currypuff/5 stone game will occur

The currypuff section where you eat it and then play AR 5 stones



The picture for this place to scan is this

# Fujian TCM



Fujian TCM is where the fish game will occur

The TCMn game is where you prepare herbs



Look for Glehnia roots  
(北沙参) and Ophiopogon  
root (麦冬)!



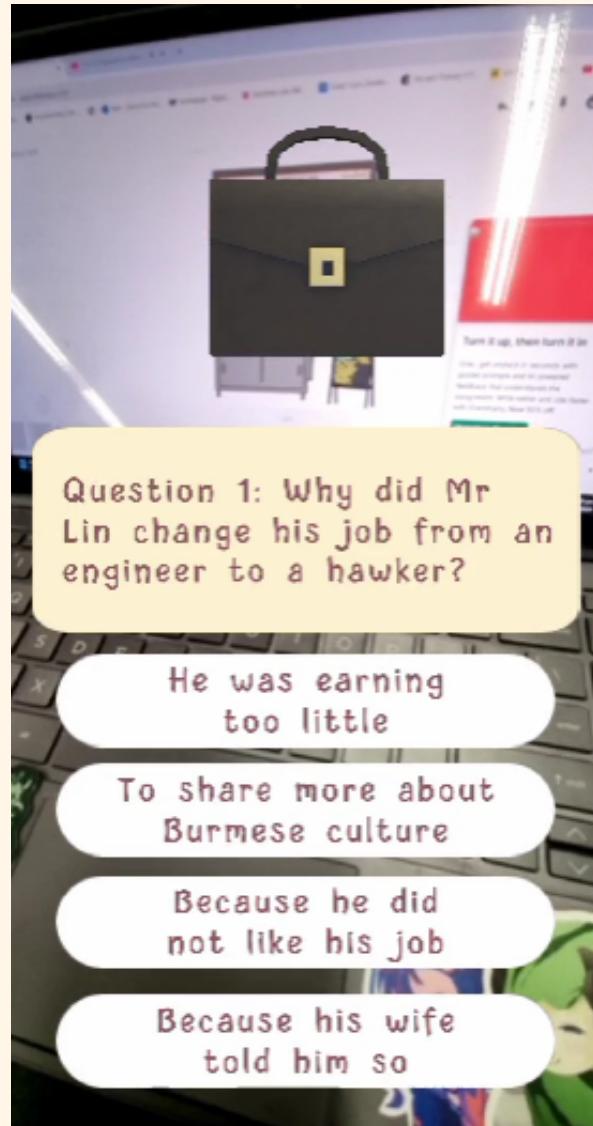
The picture for this place to scan is this

# Little Myanmar



Little Myanmar is where the quiz will happen

The quiz game will include models referencing the question



The picture for this place to scan is this

# **Game Design Segment**

## **Player**

Player is exploring 16 parts of Clementi, 6 stops digitally and 10 stops physically. Through the app they will learn more about Clementi and its heritage, through information, videos and AR mini games

## **MVP ( Minimal Viable Product )**

- Having an initial tutorial.
- [Minigame] Having a Quiz System teaching users about Little Myanmar
- [Minigame] Visiting Clementi 328 and collecting new fish for the owners and sorting them into their respective tanks
- [Minigame] Having a TCM Herb preparation game
- [Minigame] Having a waffle-making game
- [Minigame] AR eating curry puff and AR 5 stones
- Having background music and sound effects.
- Point for finishing an area.
- Having a Mural at Clementi MRT

## **Wishlist**

- Having an animated mascot character to follow you as you walk
- Have a Mini Clementi to decorate and be able to have a first person POV to walk around the created Mini Clementi
- Having an Interactive AR story
- Having a GPS system

# Final User Journey

## USER JOURNEY MAP: JourneyX

Scenario					
STAGES	Starts app, register/ sign up	Main menu	Plays through areas	Logs out	
STEPS	They open the app and either register an account or sign in	exploring the main menu	player scans an image to play an area	Player will log out	
THINKING	<ul style="list-style-type: none"> <li>What Are My Details</li> <li>I Wonder What This App Is About I Hope Its Fun</li> <li>The Profile Pictures Are Cut</li> </ul>	<ul style="list-style-type: none"> <li>There are a lot of buttons here</li> </ul>	<ul style="list-style-type: none"> <li>that is a lot of areas to visit</li> <li>I wonder what the next area is and what i will learn and see</li> </ul>	<ul style="list-style-type: none"> <li>That was a fun game time to log out</li> </ul>	
DOING	<ul style="list-style-type: none"> <li>The Player Opens The App</li> <li>The Player Then Taps To Either Register Account, Or To Sign In And They Will Type Their Details</li> <li>Player Chooses A Profile Picture</li> </ul>	<ul style="list-style-type: none"> <li>Player Logs In</li> <li>(If It's First Login Can See Tutorial)</li> <li>Can Scroll Around To Look At Locations</li> <li>Can Tap Them To Learn More</li> <li>Can Tap On Center Button To Return To The Middle Of The Map</li> <li>Can See Taskbar -&gt; Can Go To Checklist Page, Profile And Settings Page</li> </ul>	<ul style="list-style-type: none"> <li>Player Scans An Image And Plays Through Its Interactions</li> </ul>	<ul style="list-style-type: none"> <li>Player clicks the &lt;- / back button, they will be sent to the main menu</li> <li>the player then can click on log out</li> </ul>	
PAIN POINTS	<ul style="list-style-type: none"> <li>Some Players May Forget Their Password So They Cannot Log In</li> </ul>	<ul style="list-style-type: none"> <li>NIL</li> </ul>	<ul style="list-style-type: none"> <li>it is not known how many more areas there are to visit</li> </ul>	<ul style="list-style-type: none"> <li>Players may not read properly or may accidentally click on the back button, loosing all their progress</li> </ul>	
FEELING	excited interested	bit overwhelmed by the amount of buttons	happy	satisfied	
OPPORTUNITIES	<ul style="list-style-type: none"> <li>Adding a forget password button</li> </ul>	<ul style="list-style-type: none"> <li>Maybe squeeze them a bit closer so it doesn't look to crowded</li> </ul>	<ul style="list-style-type: none"> <li>Add an indicator how many areas are left to visit</li> </ul>	<ul style="list-style-type: none"> <li>NIL</li> </ul>	

# Main Functions

## Fish Game ( Clementi 328 )

Clementi 328 is a block of fish stores such as “That Aquarium”, “Polyart Aquarium” and “Clementi Florist and Aquarium”



These stores have multiple variety of fishes, thus to teach people about Clementi 328 I decided to show through the mini-game the variety of fish they can find from Clementi 328 stores, once they play it and learn that these shops have a wide variety of unique fishes, they might come back to visit it and buy fishes from them

Videos I borrowed for reference for the fishes:

- [https://www.tiktok.com/@ahguaman/video/7203305538350763271?is\\_from\\_webapp=1&sender\\_device=pc&web\\_id=7395401518084277767](https://www.tiktok.com/@ahguaman/video/7203305538350763271?is_from_webapp=1&sender_device=pc&web_id=7395401518084277767)
- <https://www.tiktok.com/@ahguaman/video/7382908929560317201?r=1&t=8onsFW2acZs>
- <https://www.tiktok.com/@ahguaman/video/7366990545815751937?r=1&t=8onsOGfLsPw&r=1>
- <https://tiktok.com/@ahguaman/video/7382908929560317201?r=1&t=8onsJlo1bFQ>

Players are first tasked to catch new fishes for the fish store's at Clementi 328, they can catch 4 types of fish, Clown Loach , Beta Fish, Angel Fish and Cardinal Tetra



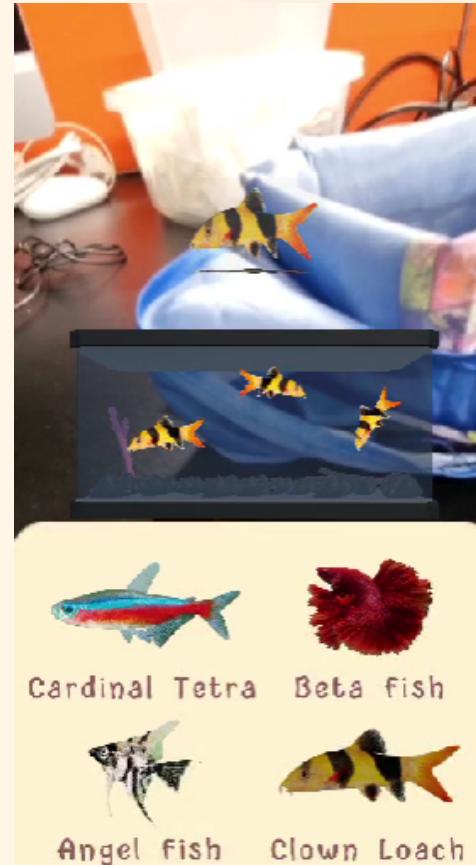
Video Demonstration:

<https://drive.google.com/file/d/1lvgpDLFNIR2N69N5D3VJN6DRde1baUT/view>

# Main Functions

## Fish Game ( Clementi 328 )

After catching all the fish, they have to sort them into the correct tanks. After sorting all the fishes they have completed their task



# Main Functions

## Quiz ( Little Myanmar )



# Main Functions

## Quiz ( Little Myanmar )

Little Myanmar is a stall that sells burmese food in Clementi where “The stall is run by Kyaw Kyaw Lin, a Mandalay native who is also a Muslim.”  
(Eatbook Staff Writer, 2023)

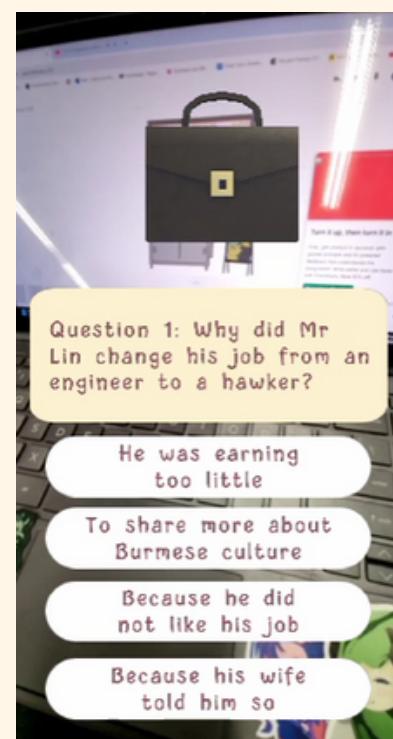


Thus we decided to be able to teach people on his culture and food, we would do a quiz, so players will test their knowledge and learn more about Little Myanmar

There would be 3 questions with models relating to the question being asked and players can interact and drag them around for fun

Video Demostration:

[https://drive.google.com/file/d/1ZiJ2XK26ol68XODA0Cb-kaRqJV0lBz /view?usp=sharing](https://drive.google.com/file/d/1ZiJ2XK26ol68XODA0Cb-kaRqJV0lBz/view?usp=sharing)



# Main Functions

## 5 Stones ( Fong Dee Curry puff )

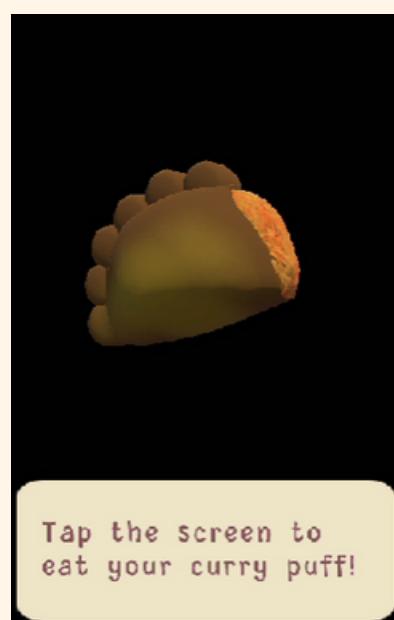
Fong Dee curry puff is a long standing store which mainly sells curry puffs. Many have enjoyed and eaten their curry puffs for years, as seen in this article, the writer states that “I’ve been eating them ever since I was a wee child. My grandmother would always buy some after her trips to the market and we’ll have them for tea time.”(Yap, November)



Since many people seemed to enjoy it over the years, we wanted to put the user in the perspective of someone who has eaten them since little like the writer in the article above and to feel nostalgia and to remember the old time’s in Singapore and Clementi’s heritage, where in the game, after they “eat the curry puff” they would feel nostalgic and remember when they were little and played traditional Singaporean games such as 5 stones.

Firs the player eats a curry puff in the game

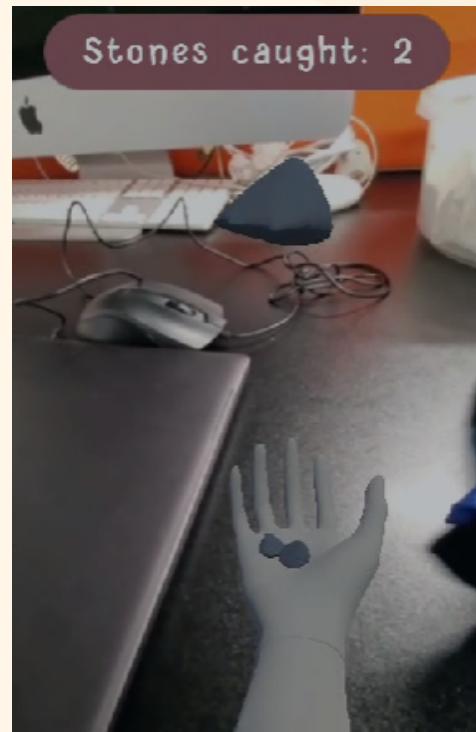
Video Demostration:  
[https://drive.google.com/file/d/1TB\\_SF7BQ55KkLfJCkd5-YIH\\_EO2RRsaoC/view?usp=sharing](https://drive.google.com/file/d/1TB_SF7BQ55KkLfJCkd5-YIH_EO2RRsaoC/view?usp=sharing)



## Main Functions

### 5 Stones ( Fong Dee Curry puff )

They will later feel nostalgic and play an AR version of 5 stone. ( 5 stone is a traditional Singaporean game where the player has to throw one stone and catch it with one hand, then two, then three, then four and five. However if they drop one stone they have to start again from 1 )



## Main Functions

### Waffle Making ( Waffletown )

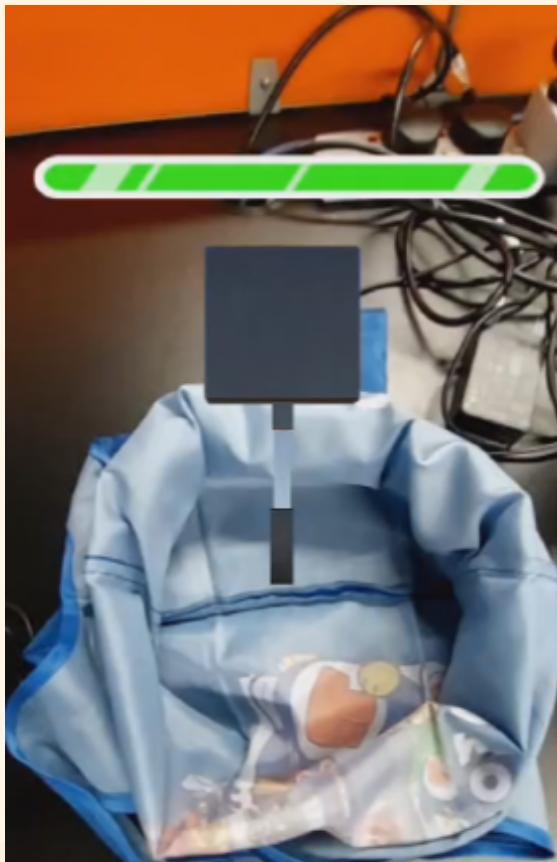


Waffletown is a shop that specialises in western food, but most importantly waffles, as shown in its name. There are a bunch of variety of different waffles you could order so we decided to have a game where you make the waffles yourself and you can decorate the waffle with toppings

# Main Functions

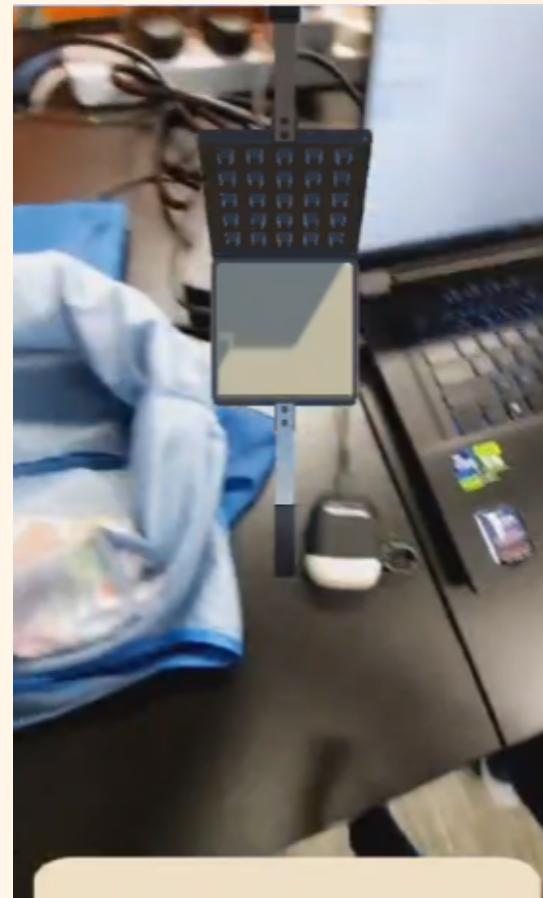
## Waffle Making ( Waffletown )

Players first pour in waffle batter and close it



Tap to flip the waffle pan when the timer is full!

When the timer is full they need to click the flip button to flip the waffle



Tap the screen to close the waffle pan!

Video Demostration:  
[https://drive.google.com/file/d/1T4c0YLiMbXGrHhCkyGPcltp55Sr-oQDX/view?usp=drive\\_link](https://drive.google.com/file/d/1T4c0YLiMbXGrHhCkyGPcltp55Sr-oQDX/view?usp=drive_link)

# Main Functions

## Waffle Making ( Waffletown )



Players can then pick to decorate their waffle with different ingredients such as butter syrup or ice cream

# Main Functions

## Herb Preparation Game ( Fujian TCM )



Fujian TCM is a shop where they sell herbs, Chinese medicine and have diagnosis. For the Chinese medicine, they hand make it out of herbs, thus we decided to have a herb/medicine preparation game so to show the player that the herbs/medicine is hand made for different symptoms and will come back to try their herbs/medicine to get better

Players look around to find the herbs

Video Demostration:

<https://drive.google.com/file/d/1-NN3rlTx99mjwcp7ZUipTIBQieabelzh/view?usp=sharing>



## Booth Idea

To promote JourneyX, we would create a booth to be shown at exhibitions.

Firstly when boozing, a common goal is to get “as many leads as possible from the event” (Persolja, 2019), which can be helpful in the success of our project in the long run

Secondly, our booth, our product and Clementi will get a spotlight, where many people at the exhibition wants to try anything AR-related since it is new and interesting, and thus will come over to try our booth and learn about JourneyX and about Clementi

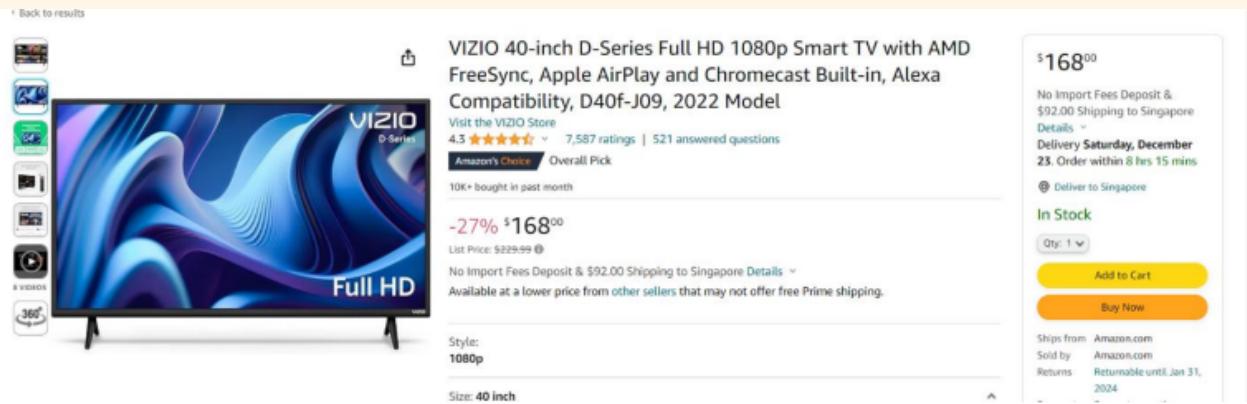
## Research images

In these research images, booths would include phones to borrow which are attached to the table, to prevent theft. Have big screens showcasing the game/gameplay and decorations relating to the booth to attract attention



## Good requirements for an Mobile Game Booth

To cast what is shown on the phone to a TV, the TV needs to have google chrome cast built in. The suggested model of TV is the VIZIO.



The listing can be seen here: [https://www.amazon.com/VIZIO-Chromecast-Mirroring-StreamingChannels/dp/B092Q1TRJC/ref=sr\\_1\\_2?crid=2PYRE2TD67HSU&keywords=tv%2Bwith%2Bgoogle%2Bchromecast%2B40%2Binch&qid=1702527263&sprefix=tv%2Bwith%2Bgoogle%2Bchromecast%2B40%2Binc%2Caps%2C445&sr=8-2&th=1](https://www.amazon.com/VIZIO-Chromecast-Mirroring-StreamingChannels/dp/B092Q1TRJC/ref=sr_1_2?crid=2PYRE2TD67HSU&keywords=tv%2Bwith%2Bgoogle%2Bchromecast%2B40%2Binch&qid=1702527263&sprefix=tv%2Bwith%2Bgoogle%2Bchromecast%2B40%2Binc%2Caps%2C445&sr=8-2&th=1)

VIZIO is a brand known for selling budget yet high quality Television screens. In this website I found they stated that “Ultimately, the Vizio V-Series offers the best picture, along with some high-quality extras at an extremely affordable price” (Lord, 2023). The reason for picking this model is because it is 40 inches big, for a affordable price, so we can save on budget while having a larger screen to grab attention better and to make it easier for people to see the screen from afar.

## **Good requirements for an Mobile Game Booth**



For players to play the game, we want to offer free phones to borrow to play the game, for this, we will choose the Galaxy A55 as our game runs best on Android devices.

Additionally, it is also a cheaper alternative for us to afford at \$618. Despite it being cheaper it is still an excellent phone for use

<https://www.samsung.com/sg/smartphones/galaxy-a/galaxy-a55-5g-awesome-iceblue-128gb-sm-a556elbaxsp/buy/>

## **Phone Specs**

Galaxy A55 5G

SM-A556ELBAXSP

My Wishlist

Product Ratings : 4.9(Number of Ratings :16)

- 6.6" FHD+ Super AMOLED adaptive 120Hz display
- 50MP wide angle camera with OIS, VDIS
- 5,000mAh (typical) more than 2 days battery
- IP67 rated, Metal frame, Gorilla Glass, Samsung Knox Vault

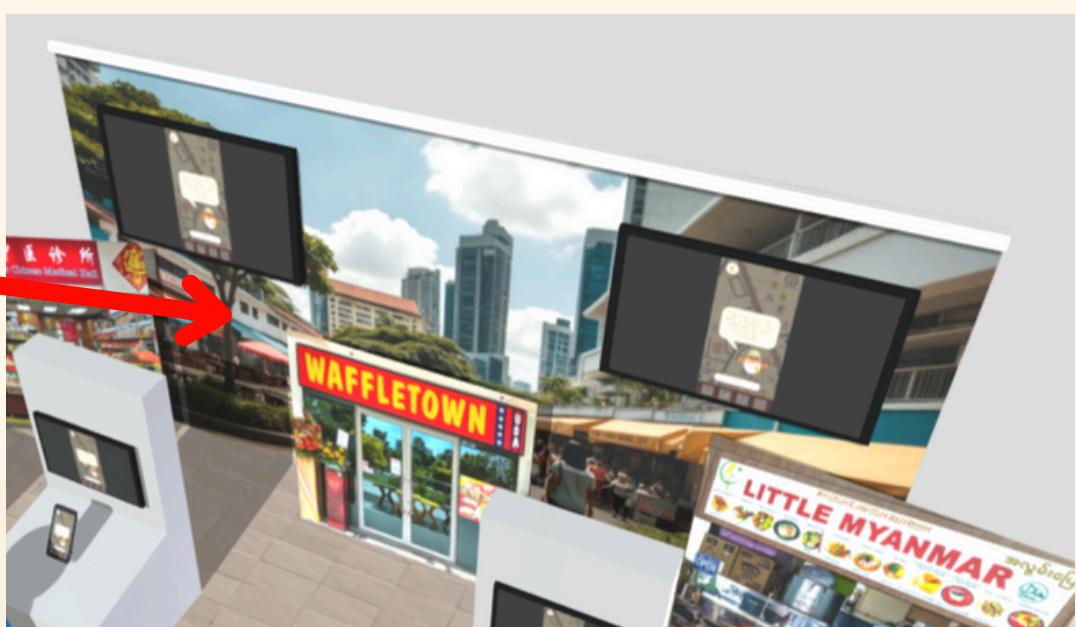
# Design Rationale

## Theming



We decided to make the booth heavily themed to both our game and Clementi. Making our booth themed, makes it look more unique and makes more people approach it and try our game and learn more about Clementi. Additionally, the themed booth makes it more memorable as well, making users remember our app for a longer period of time and to even try it out during their free time.

This  
background  
is a actual  
image from  
Clementi



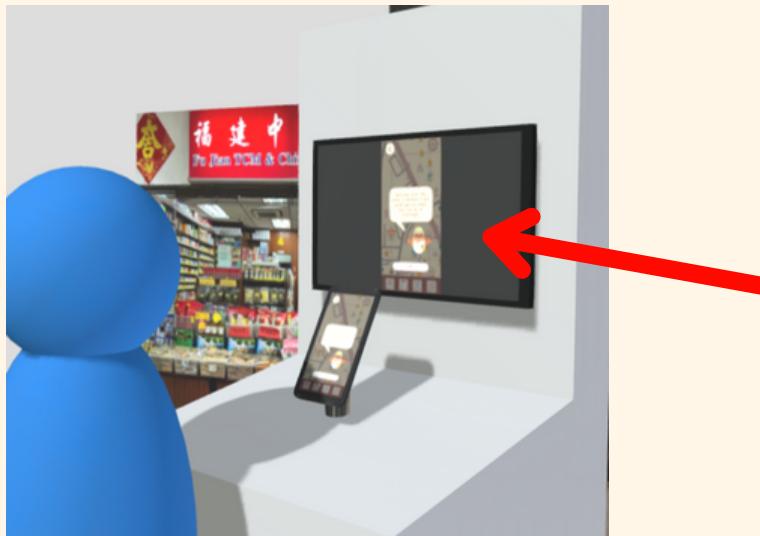
# Design Rationale

## Theming

**The floor pattern matches the background of Clementi's floor**



## Mobile Phone Booths



**TV Linked to the phone to share its screen and show gameplay from the phone**

There will be booths with phones available to borrow and use to try our game out. This is so for those who don't want to pull out their phones/people who did not bring their phones, can borrow this one, so that they can try our game on it

There is a TV linked to the phone to show gameplay, to help attract attention from those walking by or for those waiting their turn to try the game on the mobile booth to get a rough understanding how the game works

# Design Rationale

## Mobile Phone Booths



**TV Linked to the phone to share its screen and show gameplay from the phone**

The phones will be attached with a wire, so phones cannot be stolen but still be able to move around to scan the stops. Additionally, they will also be constantly charging as well from the wire so that the phone's battery doesn't die while being used



There will be two mobile booths, this would help with crowd control, where more people can try our app at a faster rate, and for people watching, they will be spread out to watch it. Additionally with two mobile booths and TV's make it easier to see the gameplay from afar or when crowded, so it can attract people's attention from further away.

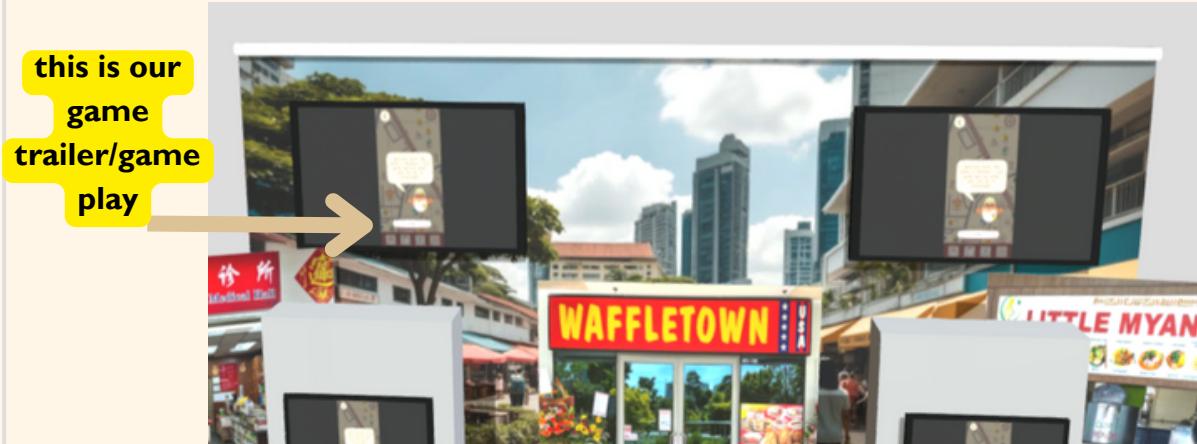
# Design Rationale

## Lighting



Lighting Dedicated lighting is needed to brighten up the booth so it is easier for everyone to see everything in the booth, such as the backgrounds, seats, signs etc. Additionally, a dedicated light is also to continue bringing in the attention since “Our natural attraction to light (Use Light to attract attention, n.d.) For this booth we decided to use LED lighting, since they’re durable, it has long life, energy efficient and is good for the environment

## Two TV around



To make it easier for everyone to see what's going on and what the gameplay is, especially when crowded, we decided to have two 40-inch televisions, the brand and model type were chosen is under the “getting the right equipment” section.

The larger televisions also make it easier to see the gameplay from afar or when crowded, so it can attract people's attention from further away. Secondly, having two screens, will also help with crowd control and the spread of where people are standing

# Design Rationale

## Standees to scan



There are 3 stands where players can scan to see 3 of the stops from the game and try it out, understand our app, and learn about Clementi. If they enjoyed the 3 stops they can download the app and go and visit Clementi themselves to experience the other stops not featured at our booth, which aligns with our goal, motivating and bringing in more people to visit Clementi and learn about its heritage and landmarks

This also makes the booth look more interesting and unique showing real life images of Clementi, making people curious and come over and see what we are promoting

# Design Rationale

## Mascot figures



There will be mascot figurines, at the height of 140cm, makes the booth look more interesting with these large figures, bringing in more people to come and visit our booth and try our game

## Promotional aspects

There will be staff members handing our flyers and posters of our game and explaining to anyone who walks by what JourneyX is about and to scan the QR code to learn more.

This is so people can bring these posters home, scan and look and learn about our game and figure out if they want to try out our game

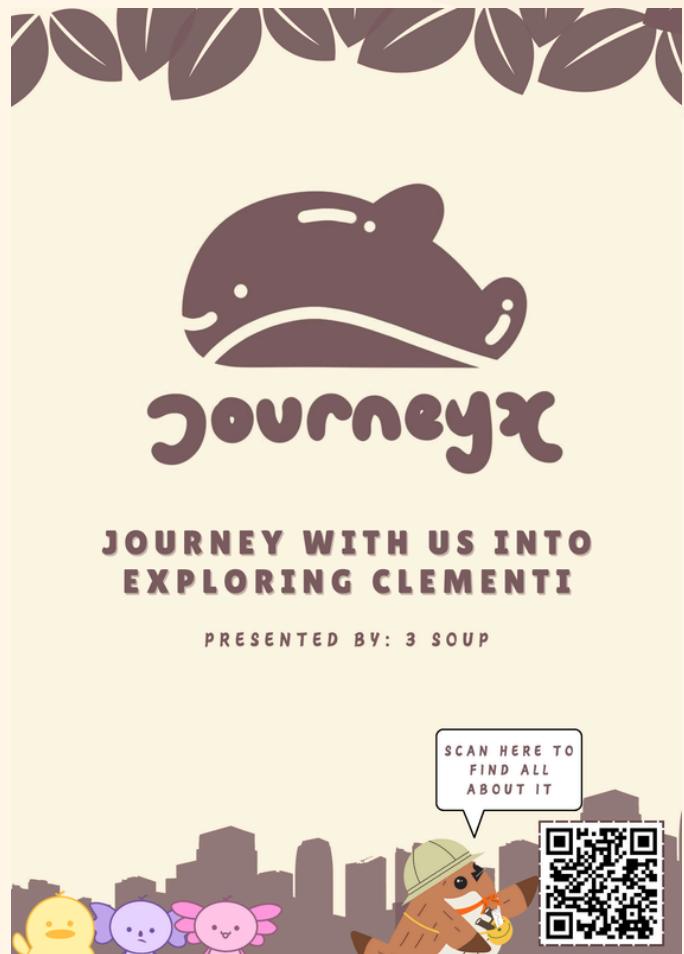


# Design Rationale

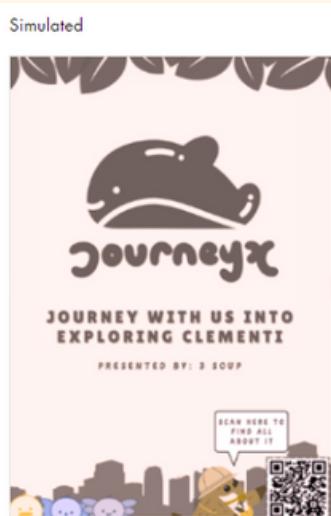
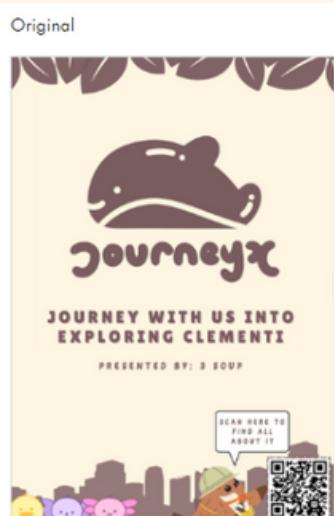
## Promotional aspects

This is our poster. It links towards our website so if people are curious they can click on it to find our website/ game.

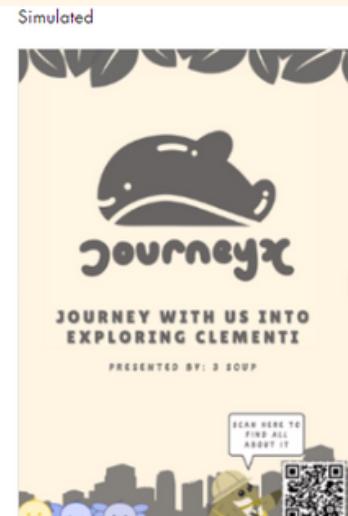
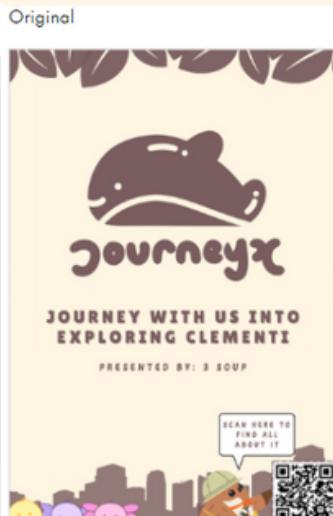
Additionally this poster visually impaired friendly as we used font from the game, and we even tested if the poster is colorblind friendly, which it is as seen below as it is still clear and easy to understand our poster without issues



## Green-Blind



## Red-Blind



# Design Rationale

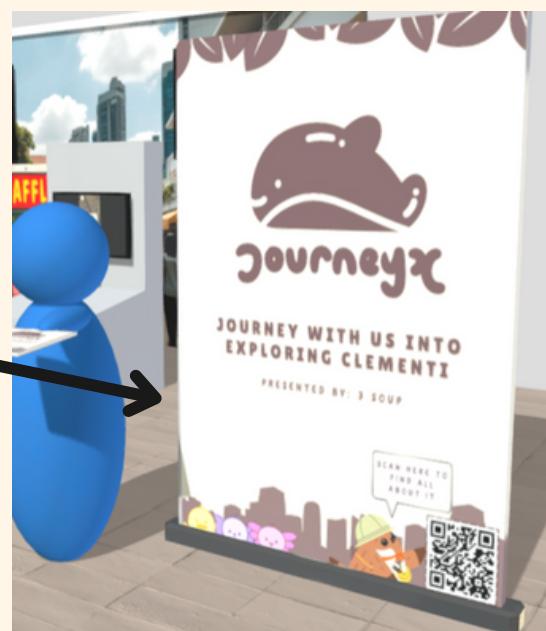
## Banners



Once attendees walk up to our booth and are wondering what's going on with the booth, they can take a look at the two banners on the left or right ( banner design is the same as the promotional flyer/poster ) to see and learn about our game by scanning the QR code, so that the workload on staff managing the booth will be less and for people to learn more about JourneyX and Clementi in general.

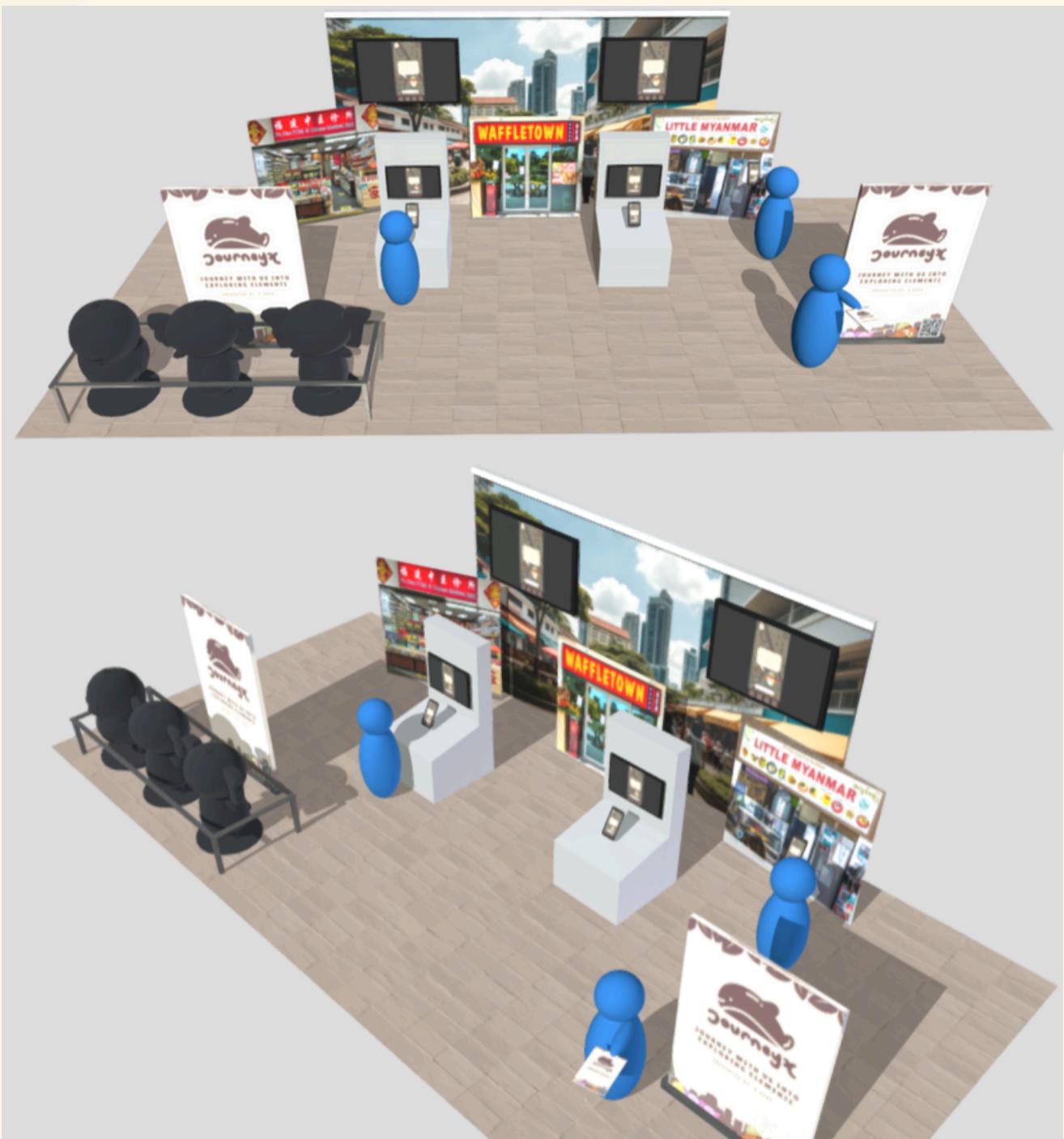
There would be two banners to help spread out the crowd and they are made bigger as well so it is easy to read from afar( if the booth gets crowded ) or in general

This is a closer look at the banner, it would be about 185cm and it is much taller than the human to scale



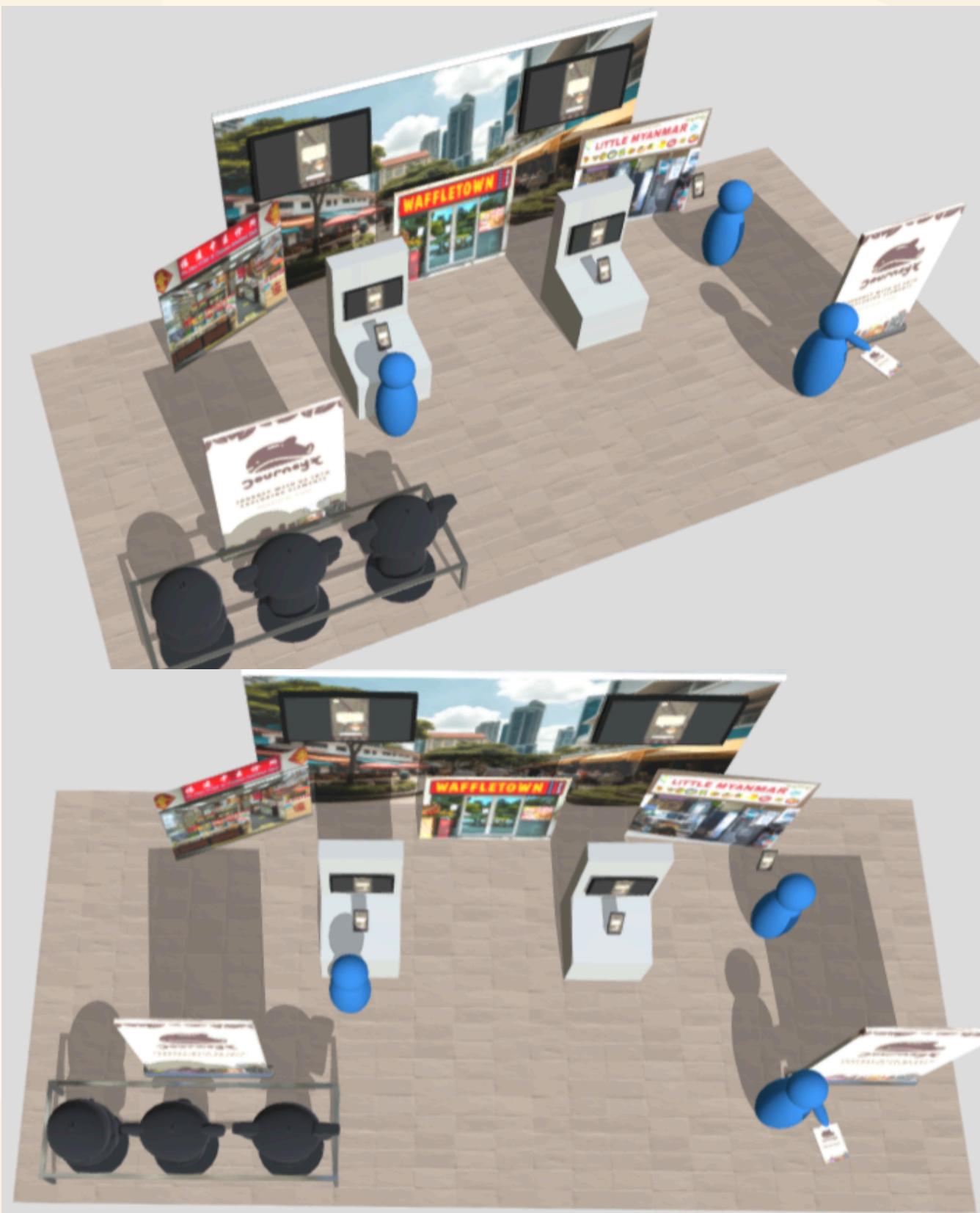
## Final Booth 3D booth

The final booth can be seen in full detail at sketchfab: <https://skfb.ly/poKIR>



## Final Booth 3D booth

The final booth can be seen in full detail at sketchfab: <https://skfb.ly/poKIR>



Texture assets borrowed: <https://substance3d.adobe.com/community-assets/assets/e0a4e3b1ac29fad3967a80e9a0c30cd144b4b2b7>

# Final Booth 3D booth

## Measurements

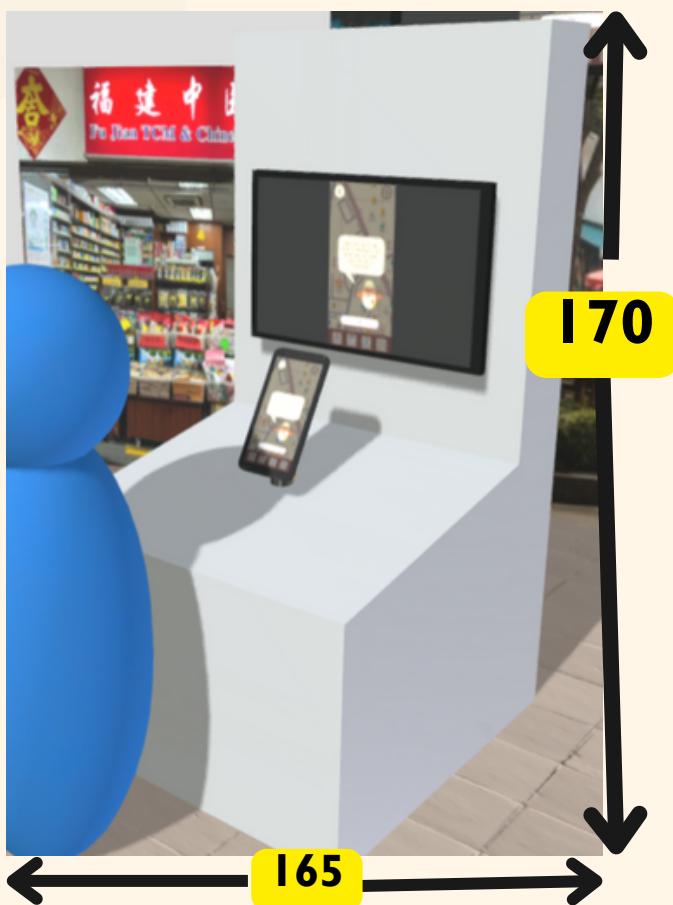
Banner would be 185cm by 20cm



Scannable stands would be about 170cm by 165cm

# Final Booth 3D booth

## Measurements



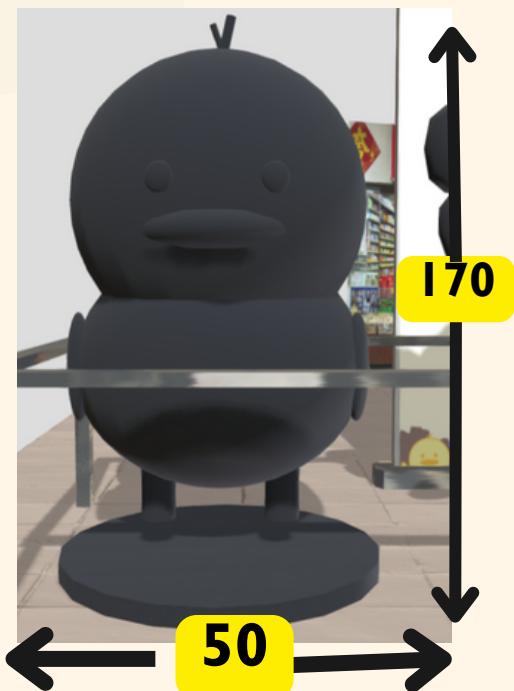
The phone booths would be 175cm by 140cm

The figures and the metal bars in total would be 50cm by 170cm



# Final Booth 3D booth

## Measurements



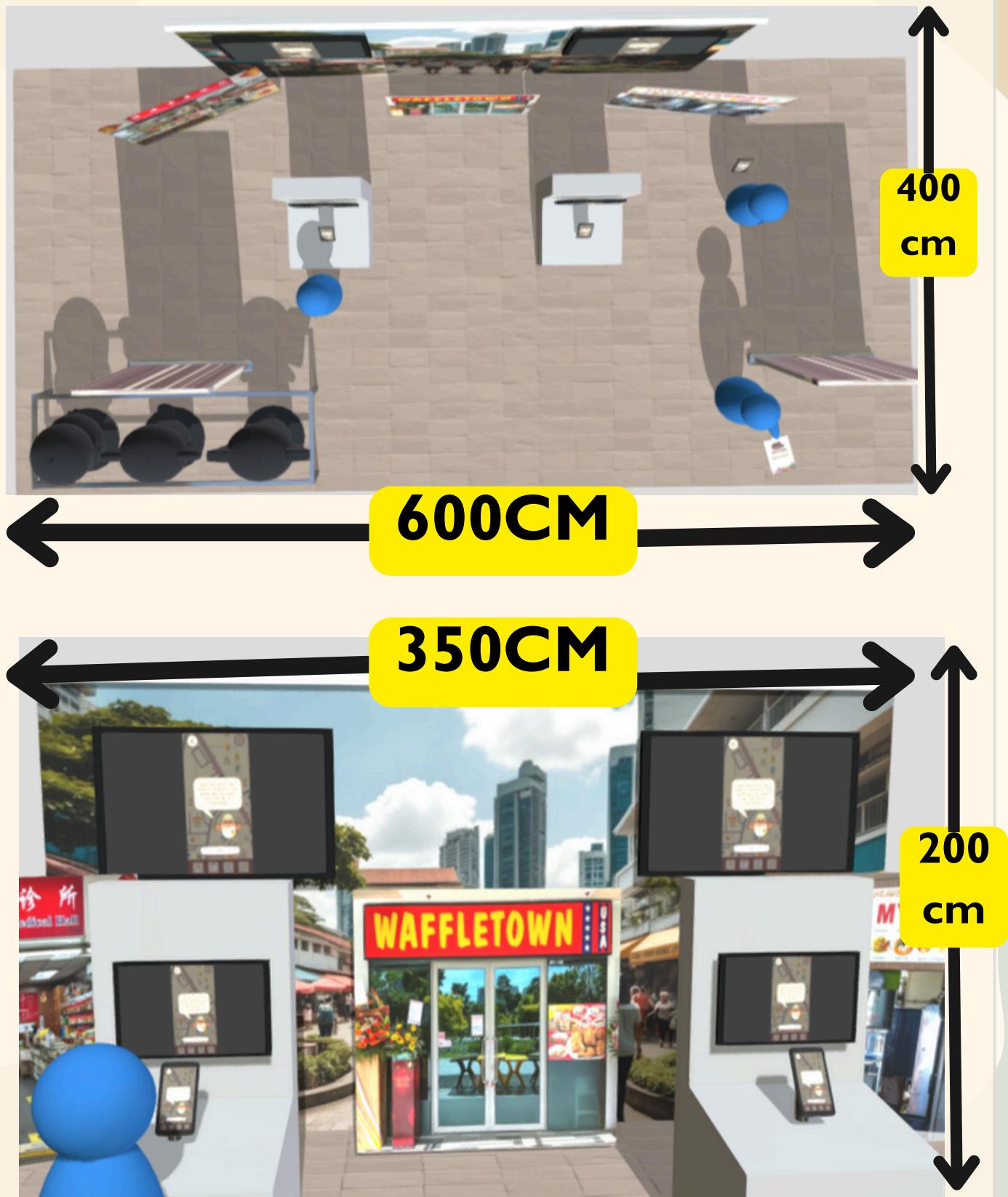
The figures and the metal bars in total would be 50cm by 170cm

The TV is a 40 inch TV (95cm x 55cm x 10cm)



# Final Booth 3D booth

## Measurements



## Physical Booth ( VIVA Presentation )



For our VIVA presentation, our member Grace Foo has prepared custom decorations for our physical VIVA booth. The design document, further images and videos for the decorations seen here can be in depth from this word link:

[https://connectnpedu-my.sharepoint.com/:w/g/personal/s10243108\\_connect\\_np\\_edu\\_sg/Ee3riHWxdx9Nhv48WYtejoABBYgtnE4hmngQRc\\_Lc6mM6g?e=p4LgS5](https://connectnpedu-my.sharepoint.com/:w/g/personal/s10243108_connect_np_edu_sg/Ee3riHWxdx9Nhv48WYtejoABBYgtnE4hmngQRc_Lc6mM6g?e=p4LgS5)



( Image taken from home, which more can be seen in the document link above )

## **References**

- Liffreing, I. (16 February, 2018). Oreo hopes to see 'Pokemon Go' success in its own scavenger hunt AR game. Retrieved from Digiday: <https://digiday.com/marketing/oreo-hopes-see-pokemon-go-success-scavenger-hunt-ar-game/>
- The Great Oreo Cookie Quest. (n.d.). Retrieved from Gravity Jack: [https://www.gravityjack.com/oreo\\_cookie\\_quest/](https://www.gravityjack.com/oreo_cookie_quest/)
- Watson, A. (n.d.). Great Oreo Cookie Quest. Retrieved from Andrew Watson: <https://www.andrewwatson.me/great-oreo-cookie-quest>
- Ojy, R. E. (n.d.). Angry Birds AR: Isle of Pigs. Retrieved from App Store: <https://apps.apple.com/us/app/angry-birds-ar-isle-of-pigs/id1456120259>
- Critic, A. (30 April, 2019). Angry Birds AR Isle of Pigs Gameplay (iOS) & First Impression Review. Retrieved from YouTube: <https://www.youtube.com/watch?v=HYHvDJWel8I>
- Turner, A. (2023). How Many Android Users Are There? Global and US Statistics (2024) (Source: <https://www.bankmycell.com/blog/how-many-android-users-are-there>). Retrieved from BankMyCell: <https://www.bankmycell.com/blog/how-many-android-users-are-there#:~:text=Globally%2C%20Android%20takes%2070.94%25%20of,to%20be%20Android%20smartphone%20users>.
- Govtech. (30 July, 2018). Celebrate National Day with this Augmented Reality app. Retrieved from Govtech: <https://www.tech.gov.sg/media/technews/celebrate-national-day-with-this-augmented-reality-app>
- NDpeeps. (3 July, 2018). NDP Jalan! - The Official NDP2018 App. Retrieved from Youtube: <https://www.youtube.com/watch?v=J8BvDHInyx0>
- PUNCHev Group. (2023, May 17). Designing For Mobile: UX Considerations For Mobile Game Development. Retrieved from LinkedIn: <https://www.linkedin.com/pulse/designing-mobile-ux-considerations-game-development-punchevgroup/>
- Oentoro, A. (2022, October 20). How to improve UI/UX in mobile games. Retrieved from BuisnessOfApps: <https://www.businessofapps.com/insights/how-to-improve-ui-ux-in-mobile-games/>

## **References**

- Shaffer, J. (2016, April 20). 5 Tips on Designing Colorblind-Friendly Visualizations. Retrieved from Table AU: <https://www.tableau.com/blog/examining-data-viz-rules-dont-use-red-green-together>
- Staats, R. (n.d.). 7 Ways you can improve color accessibility for color blind users. Retrieved from SecretStache: <https://www.secretstache.com/blog/designing-for-color-blind-users/>
- ClintonEye. (n.d.). COLOR BLINDNESS IN CLINTON. Retrieved from ClintonEye: [https://clintoneye.com/services/color-blindness/#:~:text=FACTS%20ABOUT%20COLOR%20BLINDNESS%20AND,ARE%20COLOR%20BLIND%20\(8%25\)](https://clintoneye.com/services/color-blindness/#:~:text=FACTS%20ABOUT%20COLOR%20BLINDNESS%20AND,ARE%20COLOR%20BLIND%20(8%25)).
- bdadyslexia. (n.d.). Creating a dyslexia friendly workplace. Retrieved from bdadyslexia: <https://www.bdadyslexia.org.uk/advice/employers/creating-a-dyslexia-friendly-workplace/dyslexia-friendly-style-guide/#:~:text=USE%20SANS%20SERIF%20FONTS%2C%20SUCH,MAy%20REQUEST%20A%20LARGER%20FONT>.
- Willings, C. (n.d.). Teaching Students with Visual Impairments. Retrieved from teachingvisuallyimpaired: <https://www.teachingvisuallyimpaired.com/font-legibility.html>
- uncg. (n.d.). Making Design Elements Accessible. Retrieved from uncg: <https://accessibility.uncg.edu/make-content-accessible/design-elements/>
- Eatbook Staff Writer. (28 April, 2023). Little Myanmar Review: Wallet-Friendly And Legit Burmese Food In Clementi. Retrieved from Eatbook: <https://eatbook.sg/little-myanmar-halal-foods/>
- Yap, M. (2019 1, November). Fong's Dee Curry Puff – Best Curry Puffs in Clementi! Retrieved from misstamchiak: <https://www.misstamchiak.com/fongs-dee-curry-puff/>
- kaizenaire. (n.d.). Things to Do in Clementi Singapore. Retrieved from kaizenaire: [https://www.google.com/search?sc\\_esv=463472b0d30e7bda&sxsrf=ADLYWIKAN7QXFqdHeXxDUWb2M4eNLWvYIQ:1723620656691&q=clementi&udm=2&fbs=AEQNm0AeMNWKf4PpcKMI](https://www.google.com/search?sc_esv=463472b0d30e7bda&sxsrf=ADLYWIKAN7QXFqdHeXxDUWb2M4eNLWvYIQ:1723620656691&q=clementi&udm=2&fbs=AEQNm0AeMNWKf4PpcKMI)  
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- Zioxi. (n.d.). How does colour in a learning space influence learning? Retrieved from Zioxi: <https://zioxi.com/colour-learning-space-influence-learning/#:~:text=RED%20IS%20A%20POWERFUL%20COLOUR,ATTENTION%20AND%20HELPS%20MANTAIN%20FOCUS>