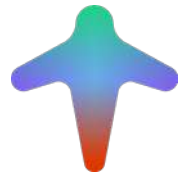


Recite.

From stage fright to spotlight.

Design Rationale.

Thomas Kelly.

Contents.

Introduction.

Positioning Statement.

As a studying interaction designer at the National College of Art and Design (NCAD), my formal education in artificial intelligence (H.Dip) complements my professional pursuits, where I emphasise a creative technologies approach.

My expertise encompasses the development of interactive prototypes, utilising both programming and hardware skills to bring innovative ideas to life. I am proficient in several programming languages, including HTML, CSS, JavaScript, and Python, which enable me to communicate visual interactions and prototypes to a refined capacity.

My strong public speaking skills have often been highlighted after industry presentations. This proficiency inspired the focus of my major project at NCAD, which aimed at enhancing public speaking confidence in young, developing professionals. The project not only honed my design skills but also demonstrated my programming ability and communication of user interactions.

Introduction. 1.

I am used to working in a multi-disciplinary environment with developers, data scientists, and marketing where I have the ability to justify design decisions and communicate effectively.


To be, or not to be...
Large Audience
Small Audience
Regular Audience
Quiet Audience
Recite.
From Stage Fright To Spotlight.

What is Recite?

Recite is a mobile application designed to enhance self-confidence in public speaking among young, developing professionals, including students and recent graduates.

The application employs a series of gamified activities tailored to hone specific skills that are crucial for effective public speaking. Each activity focuses on individual aspects of public speaking, such as vocal clarity, gesture control, and audience engagement, thereby addressing the varied components that contribute to a compelling performance. By integrating these elements into a fun and interactive platform, Recite aims to transform the daunting task of public speaking into an enjoyable and educational experience, empowering users to improve their presentation skills progressively.

An investigation of new multimodal public speaking performance measurement and feedback systems to propose a novel approach.

Thomas Kelly

Interaction Design

2024

Thesis.

Prior to commencing the NCAD Major Project 2024, my undergraduate dissertation explored the topic of multimodal public speaking performance assessment. I conducted a literature review of influential works within this domain, culminating in the proposal of an innovative methodology for assessing public speaking. This approach integrated artificial intelligence and skeletal tracking technologies, distinctively omitting the use of the Microsoft Kinect. The Kinect, while prevalent in the studied literature, was identified as prohibitively expensive, non-portable, and complex to use, thus limiting its commercial viability. This led to the development of an alternative solution, by myself, that aimed to enhance accessibility and commercialisation and reduce dependency on conventional tracking devices.

Intonation

Thomas Kelly

Speech Intensity

Thomas Kelly

Eye Contact → Gazing has a negative impact, eye contact has positive

Thomas Kelly

Gazing → Not giving sustained eye contact

Thomas Kelly

Confidence

Thomas Kelly

Gestures to empasise

Thomas Kelly

Breathiness

Thomas Kelly

Avoiding Eye contact

Thomas Kelly

Flow of Speech

Thomas Kelly

Body posture

Thomas Kelly

Stage Usage

Thomas Kelly

Leg Movement → Pacing too much

Thomas Kelly

Vocal Variety

Thomas Kelly

Pause Fillers

Thomas Kelly

Arm Movement → Gesture Usage

Thomas Kelly

Filler Words

Thomas Kelly

Thesis Findings.

Public Speaking Features.

As a result of the influential literature I gathered during my undergraduate thesis, the features of public speaking most significantly correlated with good performance were extracted.

These key features guide the activities created during the concepting phase of Recite (NCAD Major Project).

Insights.

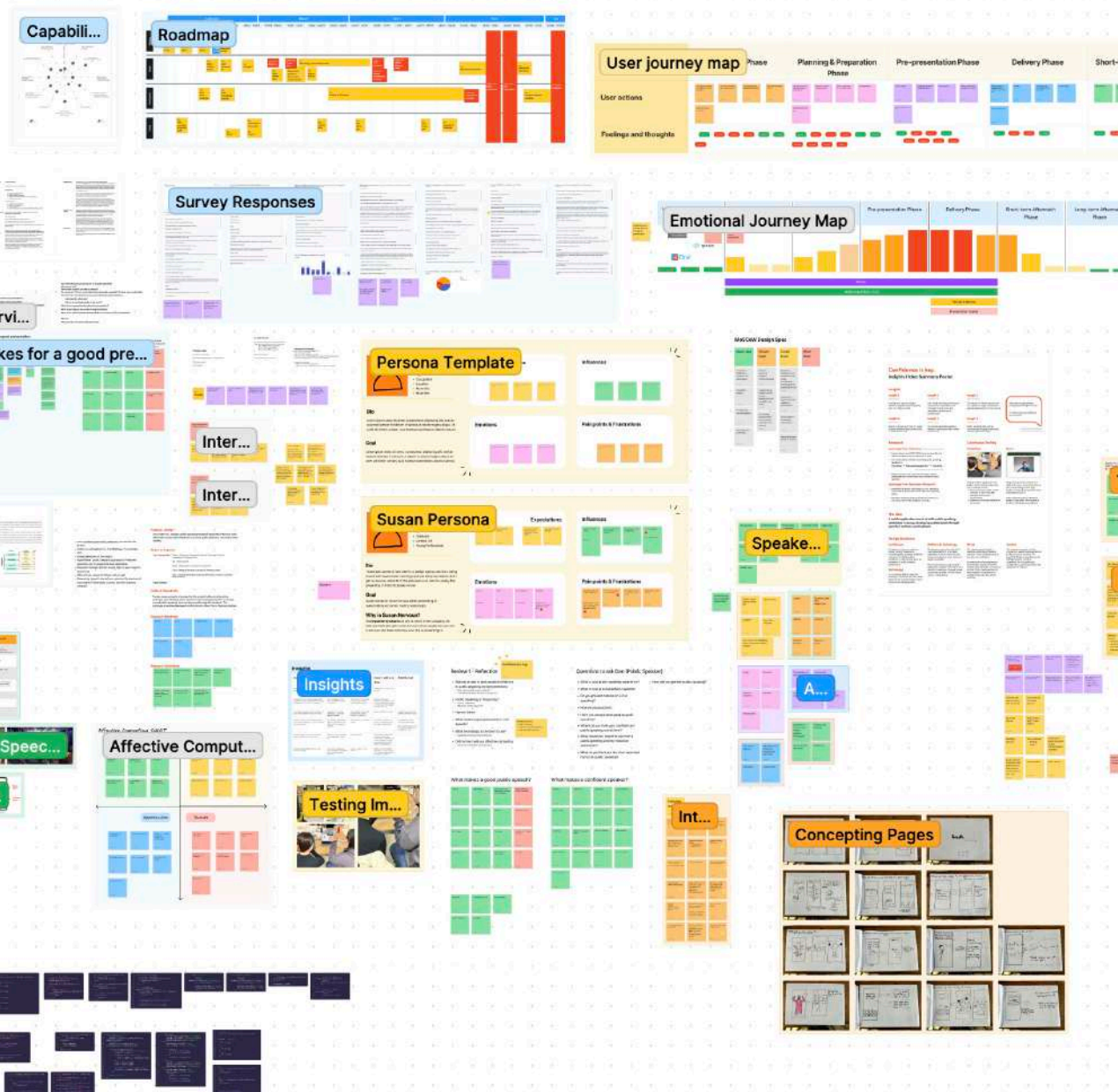
Other key insights were as follows:

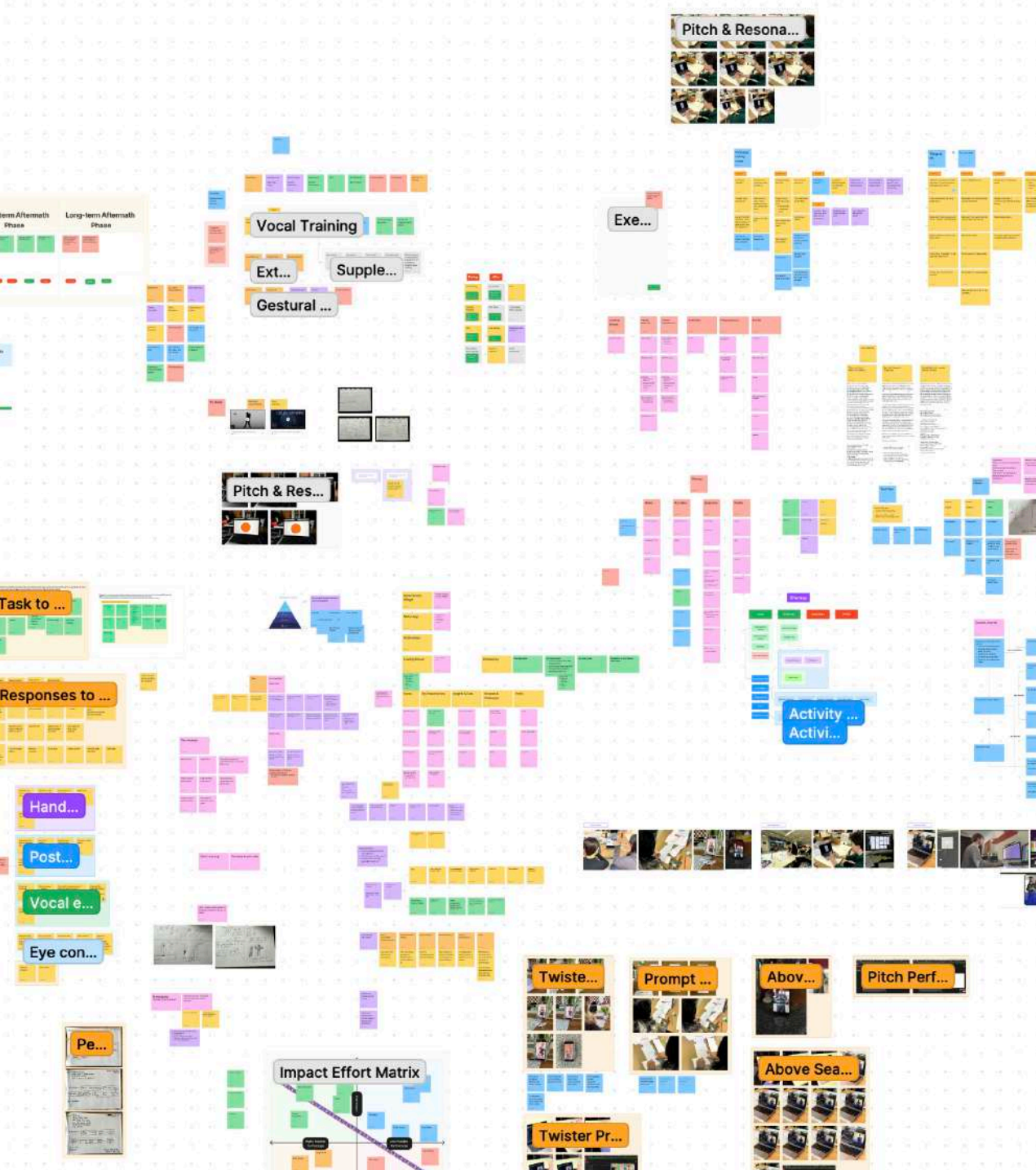
- Confidence is seen as a valid measure of public speaking ability, even if it is faked.
- No public speaking measurement tool offers control to the speaker.
- No public speaking feedback application take cultural context of the speech into account.

“Think like a wise man but communicate in the language of the people.”

– William Butler Yeats.

Research.


Capabili...
Roadmap
User journey map
Planning & Preparation Phase
Pre-presentation Phase
Delivery Phase
User actions
Feelings and thoughts
Survey Responses
Emotional Journey Map
Persona Template
Inter...
Inter...
Susan Persona
Speake...
Insights
Affective Comput...
Testing Im...
Int...
Concepting Pages


Pitch & Resona...
Vocal Training
Exe...
Ext...
Supple...
Gestural ...
Pitch & Res...
Task to ...
Responses to ...
Activity ...
Activi...
Hand...
Post...
Vocal e...
Eye con...
Twiste...
Prompt ...
Abov...
Pitch Perf...
Pe...
Impact Effort Matrix
Above Sea...
Twister Pr...

What are the stages people go through before public speeches?

Thomas Kelly

How can I build the application?

Thomas Kelly

How can we reduce their anxiety?

Thomas Kelly

How do people prepare for public speeches?

Thomas Kelly

What form of interactions are best for the application to have the most effect?

Thomas Kelly

What form of feedback do people want from their public speeches?

Thomas Kelly

Why are people anxious about public speaking?

Thomas Kelly

*Research questions

Research Questions.

To initiate the research phase, I established a series of research questions to steer the investigative process with precision.

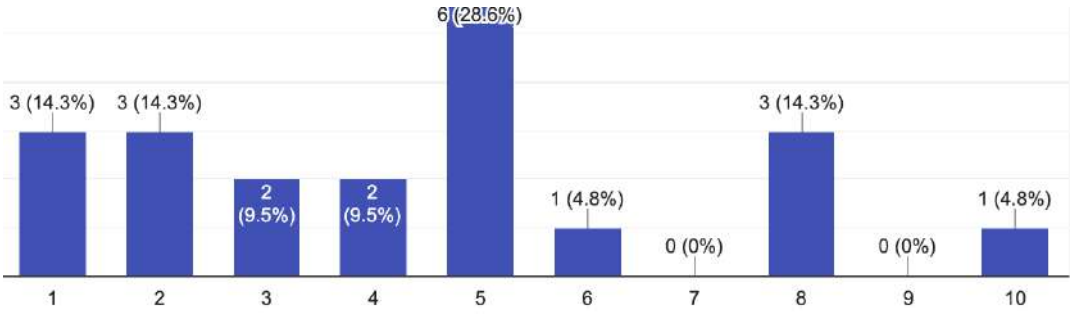
For each question, I provided a corresponding justification, clarifying the rationale behind its formulation and identifying potential sources for obtaining answers. This methodical approach ensured that each element of my research was purpose-driven and systematically aligned with relevant scholarly and industry-specific resources.

Name	Link	Logo	Direct or Indirect	In-Person or App	USP / Proposition Value	Features	Capabilities	Members / User Amount	Target Audience	Strengths	Weaknesses
Virtual Speech	https://virtualspeech.com/		Direct	Virtual Reality & Browser	• 50,000+ conversations in role-play exercises • 95% said that practicing in VR helped them better prepare for IRL situations	• Role-play with AI • Multiple training exercises	Practice in VR settings: • Meeting Rooms • Zoom meetings •	550,000+	Businesses and Groups	Large library of practice sessions	• Paid version only • For enterprise and industry • Minimum price is $45 per month • Inconsistency of design between exercises
Speeko	https://www.speeko.co/		Direct	iOS, MacOS and iPadOS	• Personalised Practice • Trusted by more than 300,000 professionals • 3,500 5 star reviews • Apple 'App of the Day' • Roger Love (vocal coach) provides vocals	• Add Customer Filler words • Real time feedback in meetings • Import Recordings for Feedback	Pace, Eloquence, Intonation, Sentiment, Talk Time, Word Choice	300,000+	Individuals, industry professionals	Simple to understand layout Apple Award	• 7-day free trial • $17.99 per month • Only on Apple Products
Orai	https://orai.com/		Direct	Mobile & Web App	• 2M+ Speeches Analysed • Highly successful speakers use it • Founder overcame fear of public speaking and made the app	• Interactive lessons made by speech coaches • Improvement tracking & insights	Pace, Filler Words, Energy, Facial Expression, Conciseness, Pausing, Confidence	300,000+	Individuals and teams	Cheapest out of competitors Oldest & Most established	• Ugly website & not much content
Toastmasters	https://www.toastmasters.org/		Indirect	In Person (Groups)	• 14,200+ Clubs • Networking Opportunity • Online reference material • 92 of Fortune 100 companies have a Toastmasters Club	• Clubs in 148 countries • Practice in front of professionals		270,000+	Individuals 47.4yo average member age	• Builds a network • In person practice	• Not everyone wants to leave their house • People lack the confidence to attend • Average members are 40-50 years old • 11.8% are students
TED	https://www.ted.com/		Indirect	In Person (Shows)	• Where inspiring people and good presenters go						
MasterClass	https://www.masterclass.com/		Indirect	Website & Mobile App	• Taught by professionals • Video Content						
Headspace	https://www.headspace.com/		Indirect	Mobile App & Website	• Prioritise your mental health • Confronts different issues, such as sleep, stress, anxiety and depression	• 500+ meditations	• Audio and Video • Additional material on website	70,000,000+	Individuals	• Great Design • Lots of types of payment plans	

Competitor Analysis.

In the competitor analysis, I assessed both direct and indirect competitors to Recite. The analysis revealed that direct competitors, primarily applications aimed at improving public speaking, predominantly cater to continuous professional development (CPD) in industry and business settings. This focus on a singular sector appears to overlook the market of young, developing professionals.

Indirect competitors included entities such as Toastmasters, TED, and Headspace, all of which emphasise education and skill enhancement. This broad approach to upskilling highlights a diverse application of public speaking and personal development strategies that cater to a wider audience but give less specific information and feedback.



*Survey answers for “How confident do you feel public speaking? 1 being not at all, 10 being comfortable“.

I just feel like what if I ruined it. What if I didn't do well or are they gonna think of that😤😤

Yes basically any time I have to make a presentation

Yes, can be extremely daunting

A lot of people have nervous tics and so do I so I think when you are aware you have them it can sometimes increase your worry and make them worse even if there is no reason for it.

A lot. If I know that I have to present, I would be really anxious about it. If I'm put on the spot, it's a bit better at the start but then it gets worse again. Funny enough, if I'm really hungover, I do a much better job at presenting, because my mind is so focused on getting what I have to say right.

I had to present my final year project proposal last year in front of two other departments as well as my own plus all these tutors n the head of NCAD n I actually just got up n left 💀I was gonna do it, it was the only reason I came in but the more I thought about it the more i couldn't do it but I don't regret leaving, 50 people is a rough crowd

Yes, I get shaky and I overthink about everything

*Survey answers for “If you have ever had public speaking anxiety, tell me about it.”

Survey.

Why?

I conducted a survey to define young, developing professionals' attitudes towards public speaking and what experiences they've had with such.

Findings.

- The majority of students ranked themselves 5 or below on a Likert Scale (1-10) for public speaking confidence.
- Most students want to appear more confident when presenting.
- Some students have physical reactions to public speaking, which they state affects their mindset for proceeding presentations.

"Meetings going over time is a real frustration of mine."

Thomas Kelly

Toastmasters has a €150-€300 yearly membership fee

Thomas Kelly

During lockdown Toastmasters was online, on Zoom, and it was "Not the same experience"

Thomas Kelly

"Toastmasters has given me the confidence to speak even after I have had social anxiety"

Thomas Kelly

People go for all sorts of reasons;

- Wedding speeches
- Business people

Thomas Kelly

Works off of Positive Reinforcement

Thomas Kelly

Toastmasters Structure:
1-2 min on Anything
3-7 mins on Formal Topics

Thomas Kelly

There is a Topic Master

Thomas Kelly

You could do something like 30 second tasks

Thomas Kelly

Its about building confidence incrementally

Thomas Kelly

Repeat structure and ritual are one reason people keep coming back to Toastmasters
Meet 1st & 3rd Wednesday every month

Thomas Kelly

For the app you could drop formality, cause people shouldn't be intimidated by public speaking

Thomas Kelly

Feedback:
Positive → Recommendation → Positive.

Thomas Kelly

"We [Toastmasters] really struggle getting young people in the door"

"Yeah, if you attended you would be the youngest there by around 10 years."

Thomas Kelly

"Will you have it on Spotify?"

Thomas Kelly

Dan sees Toastmasters as Social Capital

Thomas Kelly

Toastmasters is great for learning about timekeeping. You aren't allowed go over your allotted time. If it's 3 minutes, you stick to 3 minutes.

Thomas Kelly

You can give incentive and reward to people

Thomas Kelly

Interview.

To ascertain the expectations of a professional public speaker and gather insights for developing professionals seeking to enhance their skills, I conducted an interview with a seasoned Toastmasters speaker, Dan, who has over 20 years of experience in the field.

During our discussion, Dan provided several recommendations for the application, which are outlined as follows:

Recommendations.

- The app could work off of positive reinforcement (a similar structure to that of Toastmaster's feedback.)
- The app should focus upon building confidence incrementally.
- Formality should be dropped, because people shouldn't be intimidated by public speaking.

"Look-at-me jacket"

A jacket that I feel comfortable wearing and whenever I wear it people always ask 'Ohh who are you presenting to today?'.

Thomas Kelly

I always tell people who are nervous before presentations to not wear new shoes to a presentation, cause you just will be focussed on that

Thomas Kelly

Whenever we get a foundation graduate coming to work on client engineering they're often put-off or hesitant to speaking in workshops or client interviews

Thomas Kelly

We really look for people who are willing to put themselves out there and be able to present to clients, cause that exactly what our team is for

Thomas Kelly

The bulk of my job is facilitating workshops, so need to put myself into that position of being able to talk to whoever.

Thomas Kelly

You should wear something comfortable so you can give your full attention to the presentation

Thomas Kelly

I know its cringey, but it what I always tell our foundationers is "Fake it till you make it".

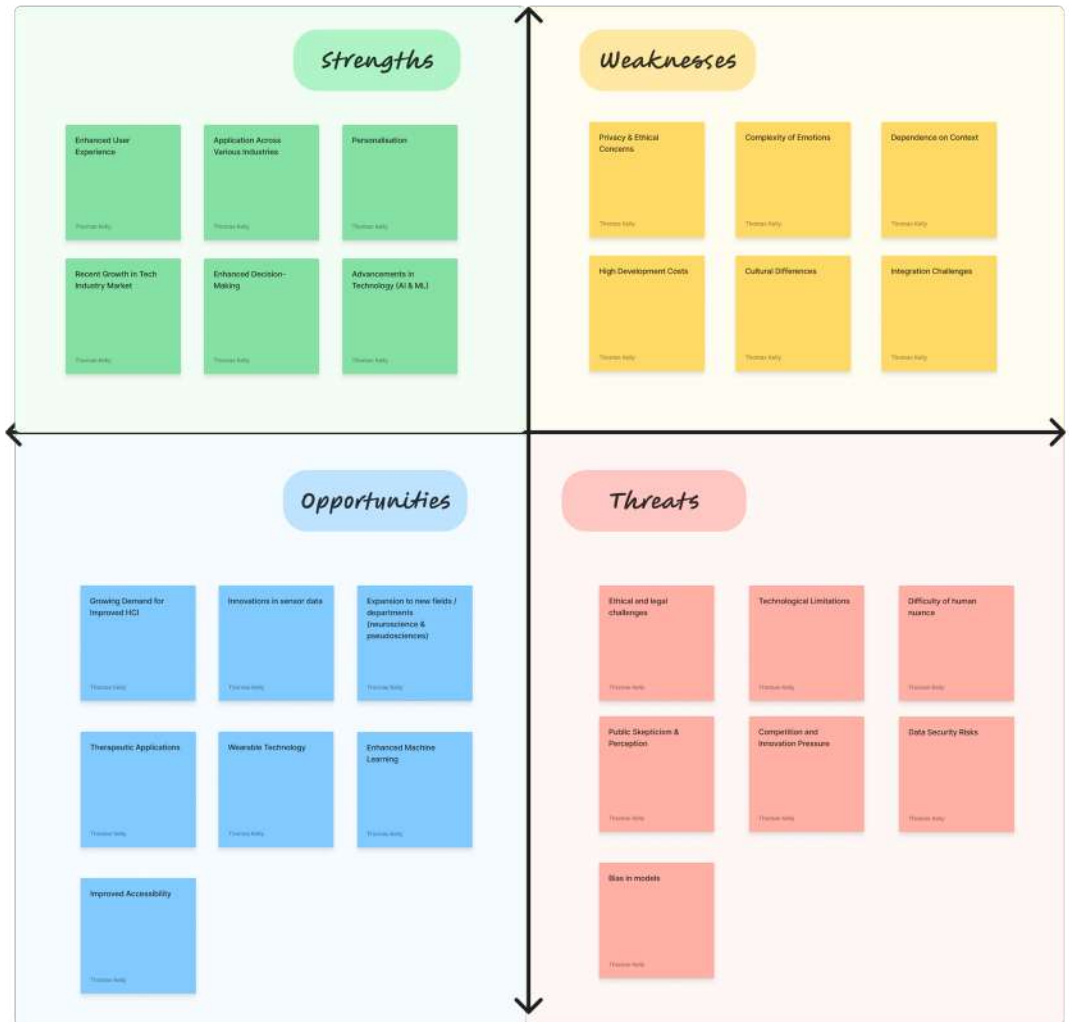
Thomas Kelly

*Interview quotes and notes.

Other Interviews.

To inform the expectations of those who view and judge students and graduates' public speaking abilities, I conducted interviews with a hiring manager, a design lead, and a workshop facilitator.

A recurring theme emerged from these discussions: there is a notable perceived lack of confidence among young, developing professionals when they transition into industry. This insight underscores the importance of addressing confidence-building in Recite.



*SWOT analysis

SWOT analysis.

From a brief I developed before beginning the Major Project, the interaction design philosophy of affective computing was identified as a key methodology to implement throughout the design and development phases.

To understand the potential of affective computing within Recite, I conducted a SWOT analysis. This analysis was instrumental in identifying the strengths, weaknesses, opportunities, and threats associated with integrating affective computing methods, particularly as I moved into the concepting phase of the project. This evaluation informed the integration of personalisation of the learning experience (the custom activity journey, to be seen in the 'Interactive Prototype 4' section).

“We really struggle getting young people through the door.”

Insights.

- Confidence is seen as a major validation of public speaking ability even if it is fake or acted.
- Most public speaking performance measurement applications use Microsoft Kinects, which are unfeasible to justify the use of commercially.
- The thought of looking nervous or out-of-place on stage makes public speakers exponentially more nervous.
- Repeat structure and ritual is a major reason members keep coming back to the Toastmasters club.
- No commerical public speaking feedback application takes cultural context into account.
- Public speaking clubs such as Toastmasters struggle to get young people under 30 to join.

“All the great speakers were bad speakers at first.”

– Ralph Waldo Emerson.

Define.


29.

Susan Persona

Susan Gibson

Graduate Designer

- 23
- Graduate
- London, UK
- Young Professional

Bio

"I have just started a new role for a design agency and I am being tasked with stakeholder meetings and workshop facilitation, but I get so nervous when all of the pressure is on me! I'm usually fine presenting in front of people I know"

Goal

Susan wants to not be nervous when presenting to stakeholders and when hosting workshops

Why is Susan Nervous?

Has **imposter syndrome** as she is newly in her company. As well, she feels she gets more nervous when people can see she is nervous and does not know who she is presenting to.

Needs

Expectations

Influences

Emotions

Pain points & Frustrations

Personas.

Persona 1.

Student

- Physical reaction (shaking) to public speaking.
- Focussed on forgetting what to say.
- Identified that they need to speak louder, clearer, slower and work on eye contact.

Persona 2.

Graduate Designer

- Imposter syndrome in stakeholder meetings.
- Facilitator of workshops.
- Wants to come across as professional.

Persona 3.

Best Man

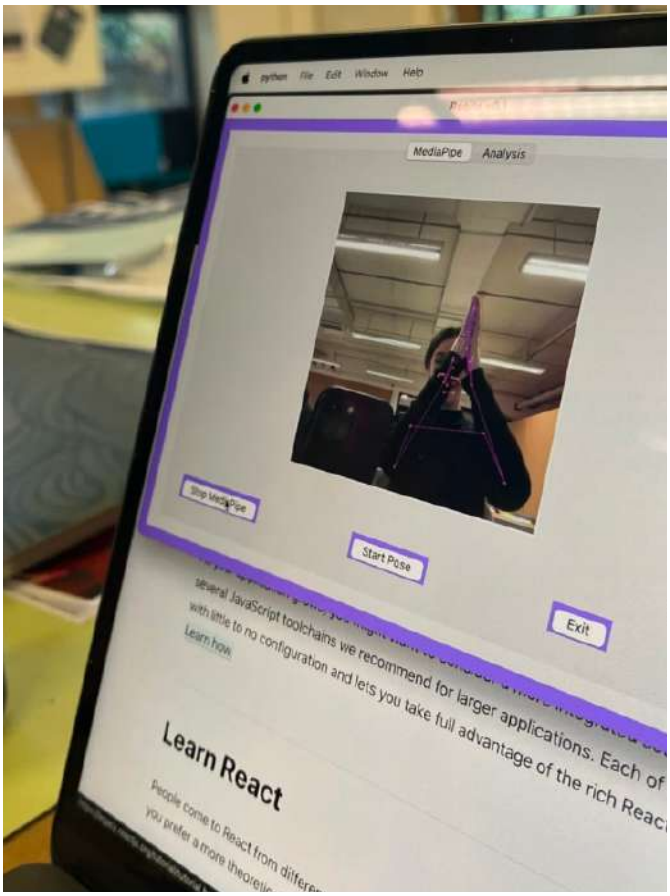
- Giving a wedding speech.
- Will possibly be heckled on stage
- Some public speaking experience
- Voluntary of him to do speech.
- Large audience.

“...people shouldn’t be intimidated by public speaking.”

The Approach.

Tackling the problem.

Moving forward, the strategy to enhance public speaking confidence among young developing professionals and to address the specific needs and wants of each persona was to implement gamified activities. These activities focussed on various aspects of public speaking, drawing attention to each feature. This approach aimed to engage users in a dynamic and interactive manner, fostering skill development through practical and enjoyable exercises that make learning both effective and enjoyable.


MediaPipe
Analysis
Start Pose
Exit
Learn React

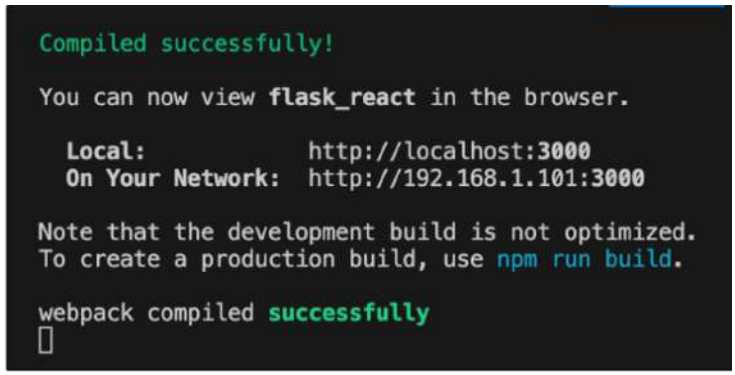
Testing Reactions.

Adopting a creative technologies approach to the project necessitated continuous development and testing, which occurred in tandem with ongoing research and concepting phases.

The initial build of the project (left) measured skeletal points of the body and generated scatterplot graphs to illustrate fluctuations in movement. This feature was helpful in providing visual feedback that helped users understand and improve their physical engagement during practice.

The court of public opinion.

Testers of the build were observed dancing in front of the detection system, deriving enjoyment from the interactive outcome. This behavior resurfaced the feedback received from the Toastmasters interview, which suggested that the application should adopt a light-hearted and gamified approach. This observed behaviour justified the direction to make the learning experience more engaging and enjoyable.


Compiled successfully!
You can now view flask_react in the browser.
Local: http://localhost:3000
On Your Network: http://192.168.1.101:3000
Note that the development build is not optimized.
To create a production build, use npm run build.
webpack compiled successfully

Technical Exploration.

Initially considering a web-app as the optimal platform for Recite, I embarked on a technical exploration by building small prototypes to assess the feasibility of this approach given my programming capabilities.

My first attempt at creating a web application involved using React.js for the front-end framework to manage styling and page layouts, paired with Flask, a Python library, for the backend. However, I encountered significant challenges when attempting to integrate these technologies. Specifically, issues arose with AXIOS, a HTTP client, which failed to display information in the browser due to browser security protocols. This problem highlighted the complexities of cross-origin resource sharing (CORS) in rapid-development.

Given the persistent nature of these issues, which could potentially recur with changes in the type of information being posted to the browser. I decided, it made most sense to try alternative means of moving forward to ensure deadlines would be met and scalability was still possible.

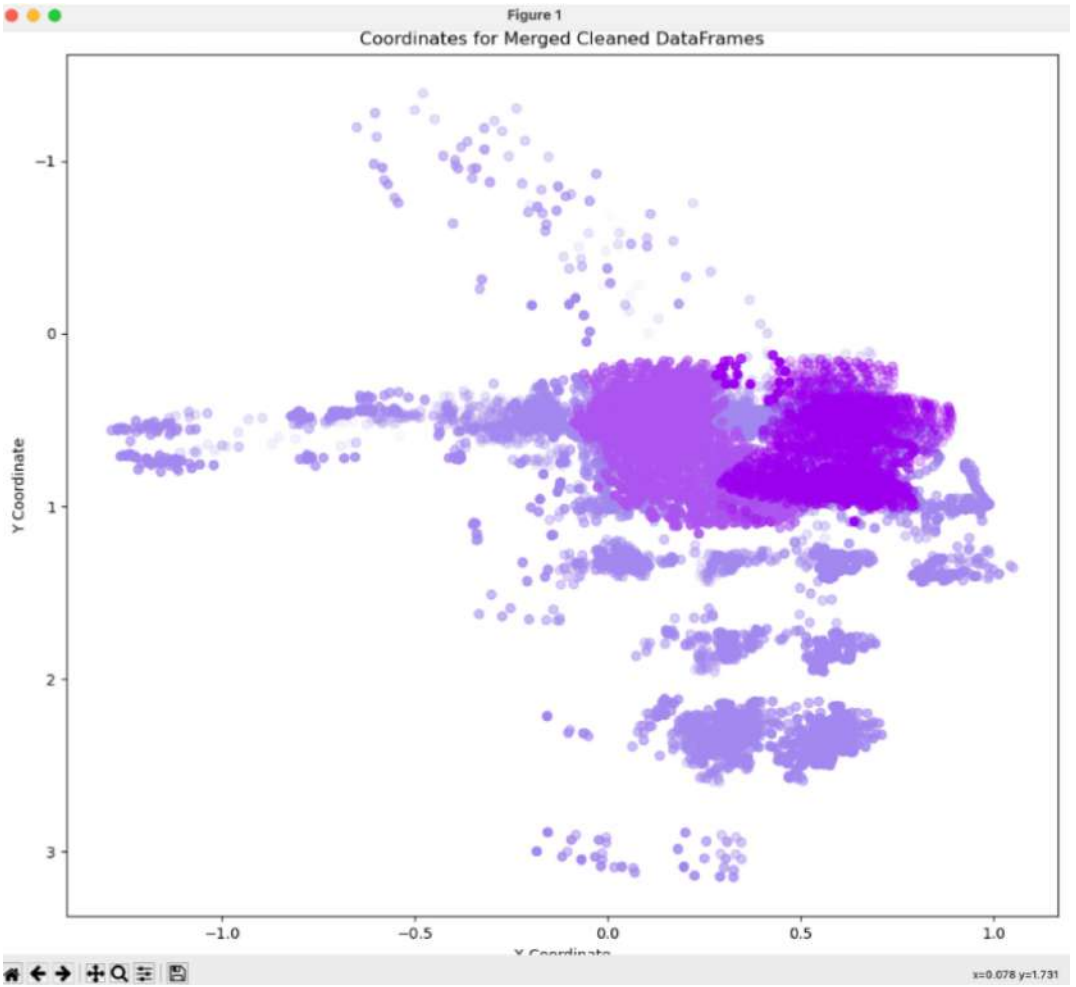


Figure 1
Coordinates for Merged Cleaned DataFrames
Y Coordinate
−1
0
1
2
3
−1.0
−0.5
0.0
0.5
1.0
x=0.078 y=1.731

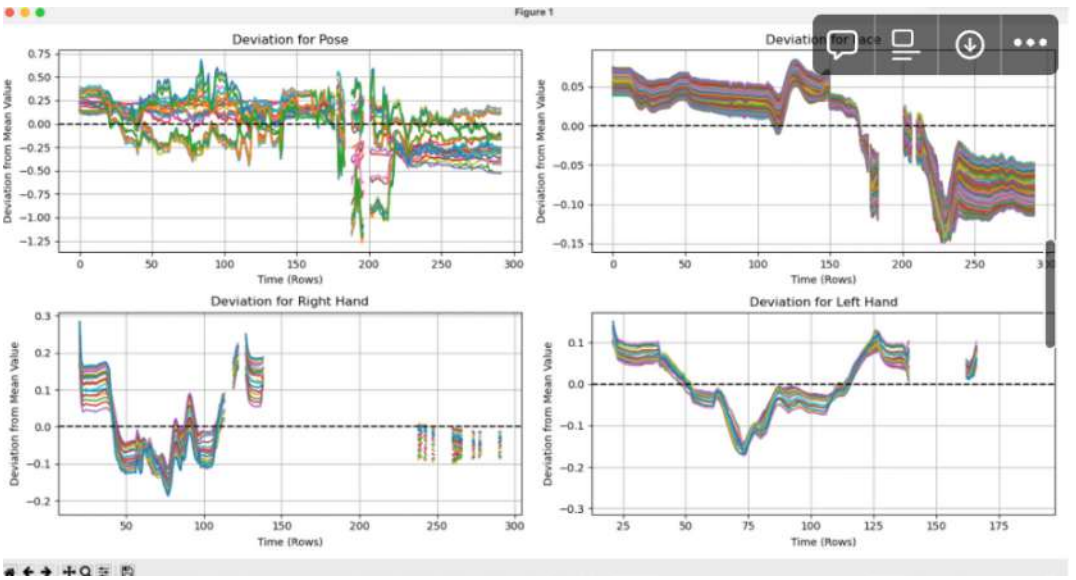


Figure 1
Deviation for Pose
Deviation for Face
Deviation for Right Hand
Deviation for Left Hand
Deviation from Mean Value
Time (Rows)

Technical Exploration.

In my exploration of different technologies for the Recite project, I created a new prototype using Python's TKinter library for the user interface, which integrated MediaPipe Holistic for skeletal detection. MediaPipe Holistic is a library capable of detecting over 400 points on the human body.

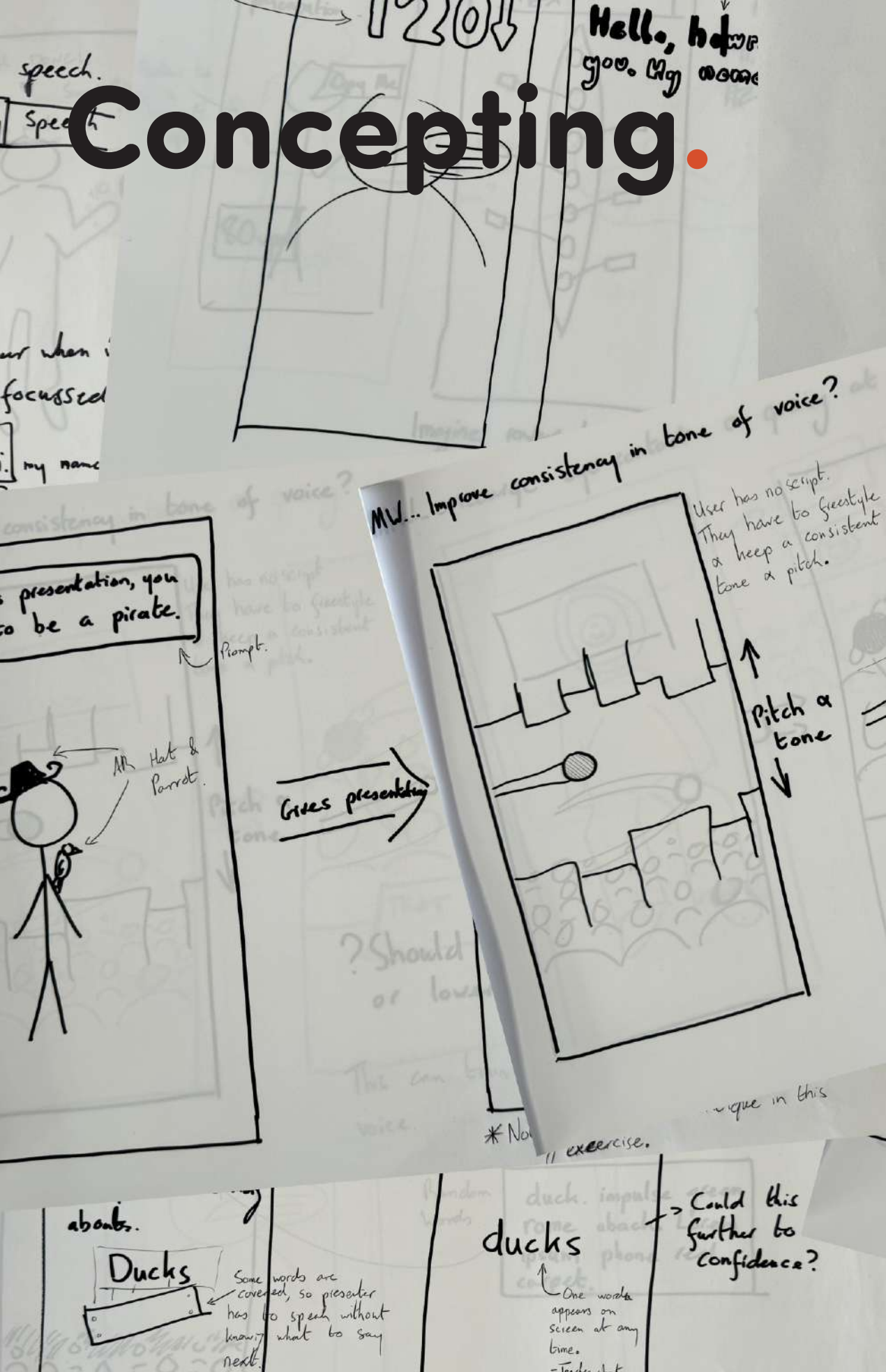
This application was designed to capture webcam input and export the skeletal data points to a CSV file. This approach allowed for the data to be visualised in an interactive manner. Using the exported CSV data, I developed interactive scatterplot graphs (see top image to the left) to display the location of these points over time. Such visualisations afforded observation and understanding of the dynamics of body movements during public speaking, particularly how participants move their arms and heads.

Additionally, I created line graphs that tracked the deviation of different skeletal positions over time (see bottom image to the left). This graph was particularly useful for analysing patterns in arm and head movement, which are used in public speaking.

“If you don’t know what you want to achieve in your presentation your audience never will.”

– Harvey Diamond.

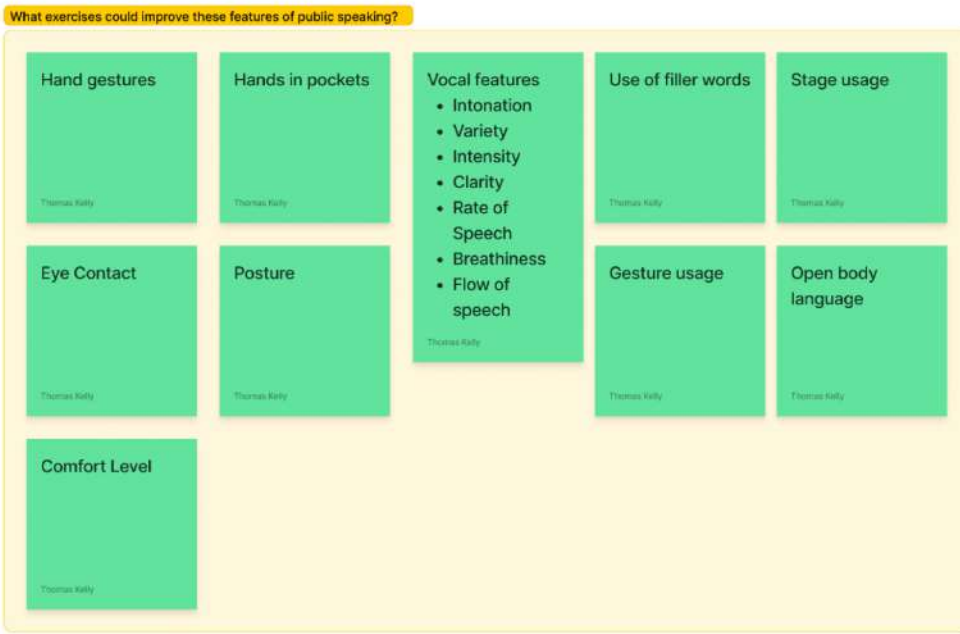
Concepting.


speech.
Speech
MV... Improve consistency in tone of voice?
User has no script. They have to freestyle & keep a consistent tone & pitch.
Pitch & tone
presentation, you
be a pirate.
Prompt.
Hat & Parrot.
Gives presentation
exercise.
Ducks
Some words are covered, so presenter has to speak without knowing what to say next.
ducks
One words appears on screen at any time.
Could this further to confidence?


breath.
Dot motif to help with breathing
Exhale.
Ripple.
* Slight pitch variation to keep audience engagement.
hi. My name is user 1.
? Should sentences end w higher or lower pitch?
This can train users on their pitch & tone of voice.
Video Compilation
BOO!
Present while crowd boos at you.
We found that ...
Leave user without ending of script. So they have to think on their feet.
Unlimited Try Agains.

Task:

Context: You are making a public speaking confidence improvement app. Users will improve through **fun**, **gamified exercises**.
Task: Create as many exercises the app could provide to improve the features shown below.
Eg: To improve eye contact, the user must keep eye contact with a teleprompter while practicing a speech.

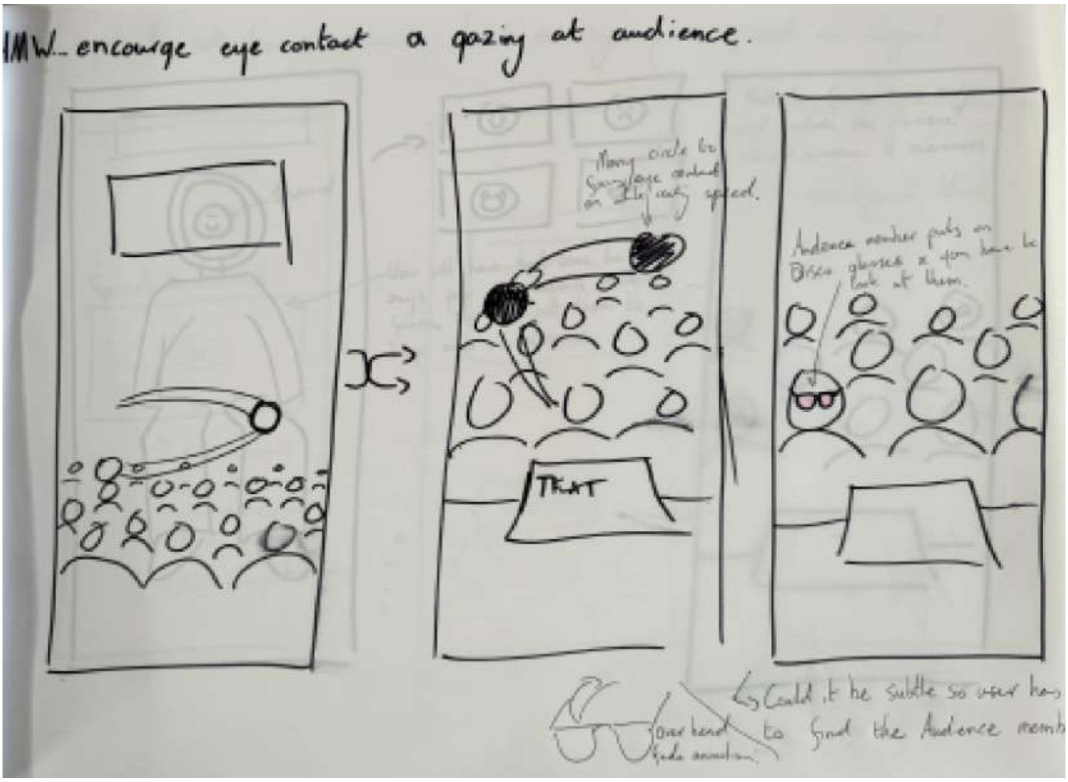


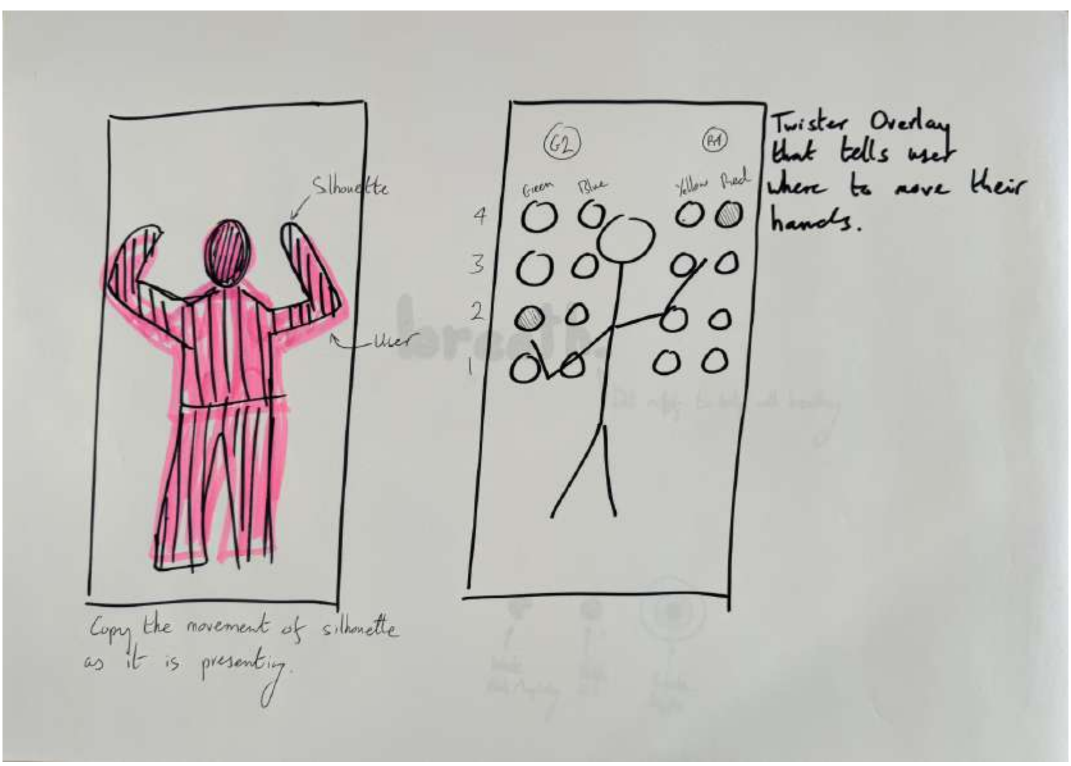
Responses:

Co-design.

I tasked other interaction designers, who also represent the target user group of young, developing professionals for Recite, to generate activity ideas. These activities were designed to allow users to practice each feature of public speaking, ensuring that the application's content was both relevant and beneficial to its intended audience. This co-design approach leveraged the designers' dual perspectives as both creators and potential users.

The list of public speaking features significantly correlated to good performance was previously mentioned on the 'Thesis Findings' page.

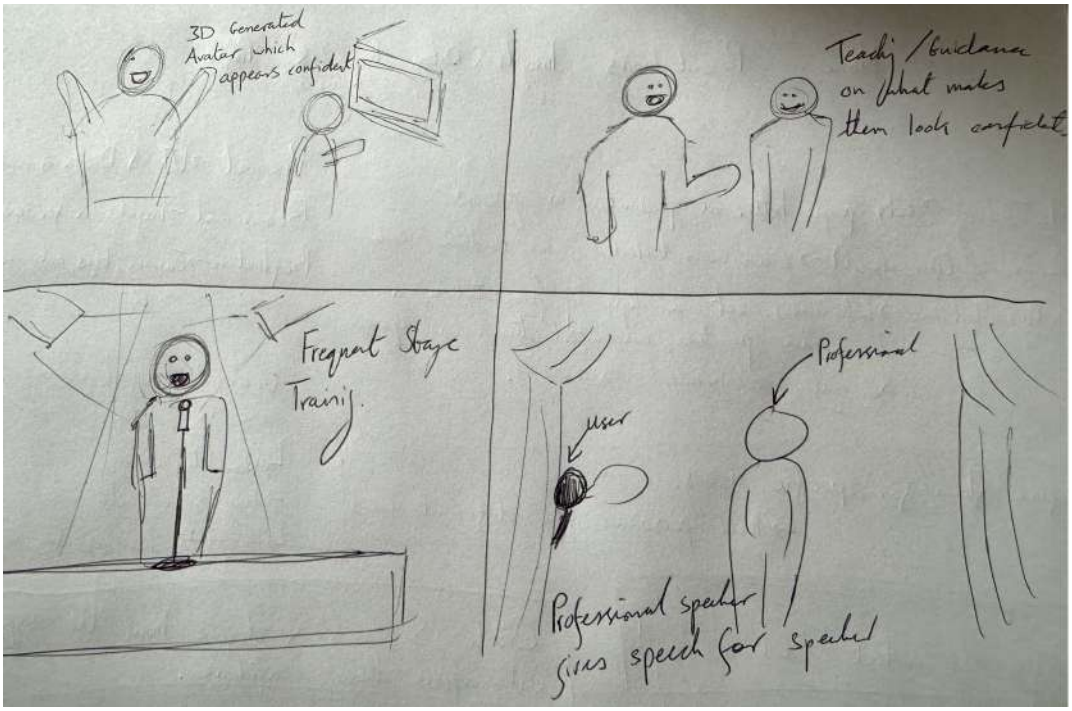

HMW - encourage eye contact a gazing at audience.
TEXT
Audience member puts on Disco glasses & you have to look at them.
Could it be subtle so user has to find the Audience memb


Silhouette
User
Copy the movement of silhouette as it is presenting.
G2
R1
Green
Blue
Yellow
Red
4
3
2
1
Twister Overlay that tells user where to move their hands.

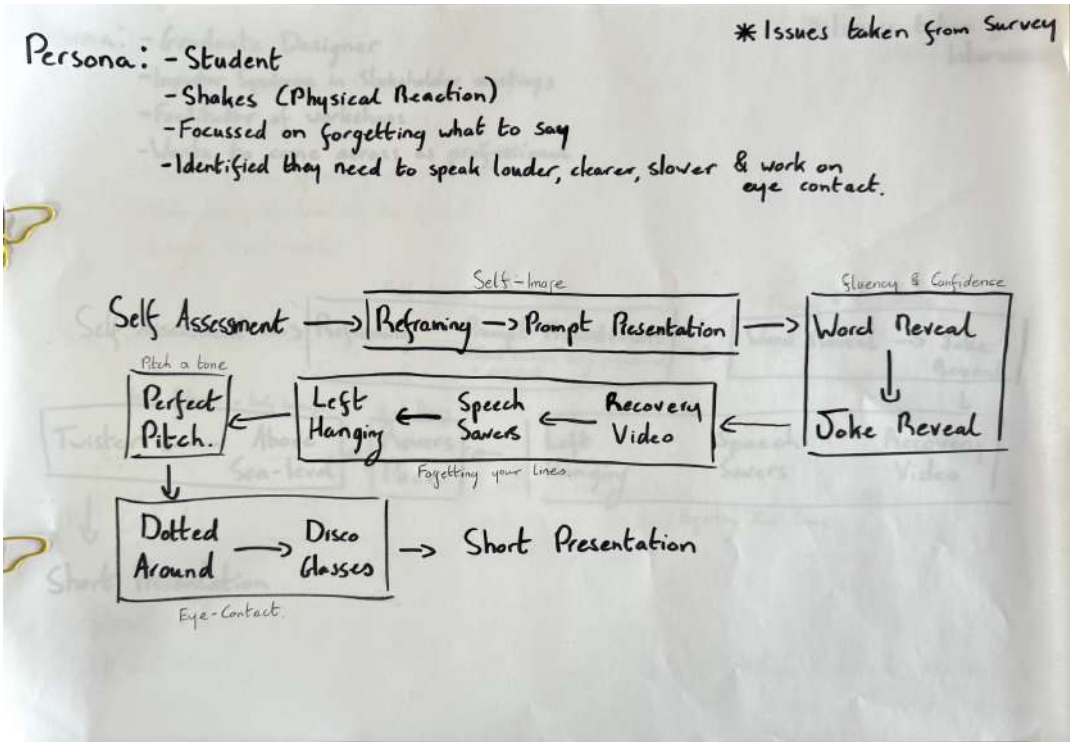
Ideation.

As part of an ideation exercise, a series of over 15 A3 pages were created to generate additional activities that could provide users with practice in various features of public speaking.

The consideration of these activities was facilitated through the use of “How might we” statements, which helped to focus and direct the concepting process. The activities developed concentrated on key aspects of effective public speaking, such as breath control, open body language, arm movement, vocal flow, and pitch variations, among others.



*Some sketches from a crazy eights session.



*Ideation for a user flow of the student persona using issues taken from interviews and the survey.

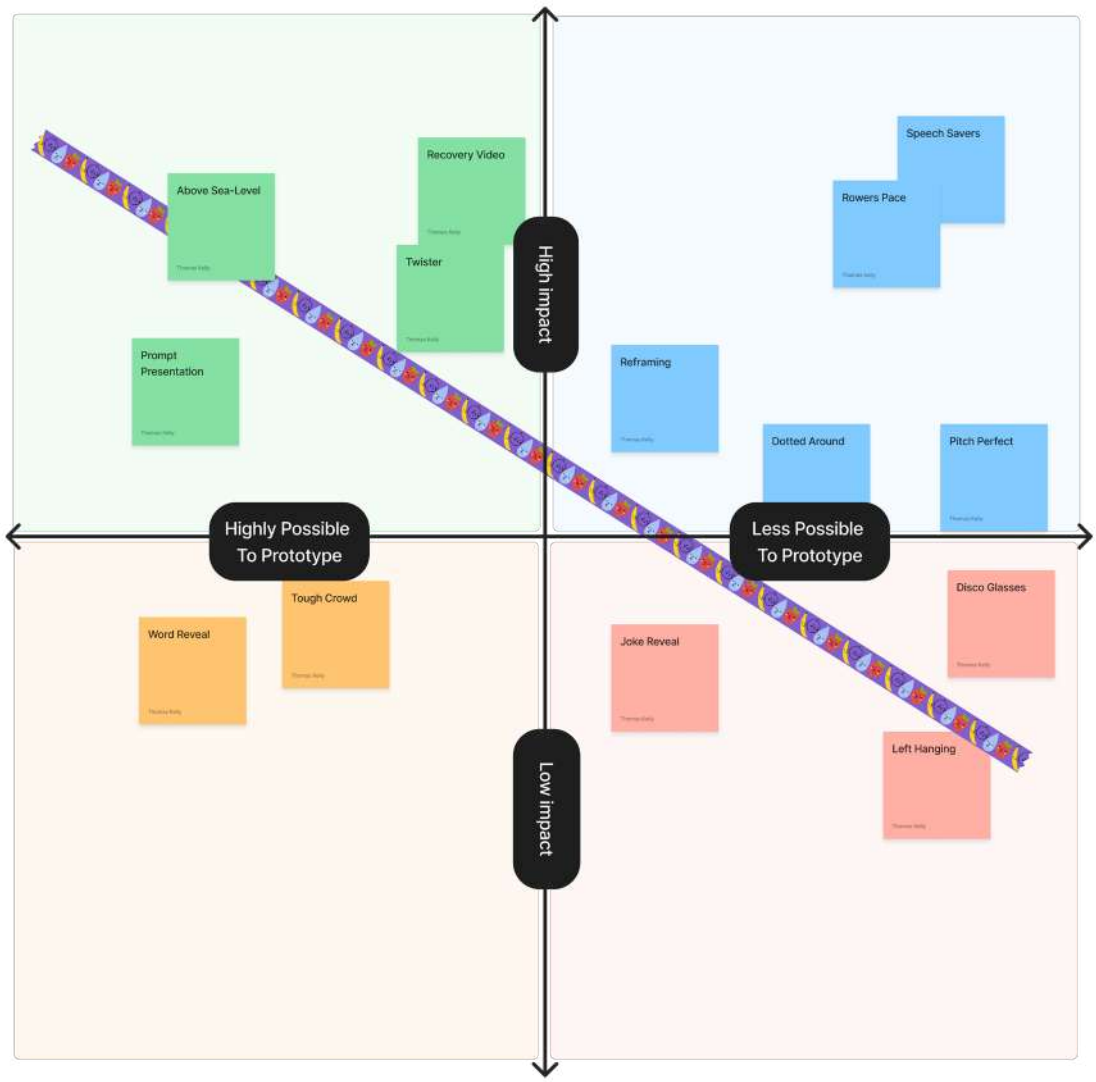
Ideation.

Crazy Eights.

I rephrased the previously used “How might we” statements to facilitate different outcomes as I delved into new activities through the crazy-eights idea generation method.

User Flows.

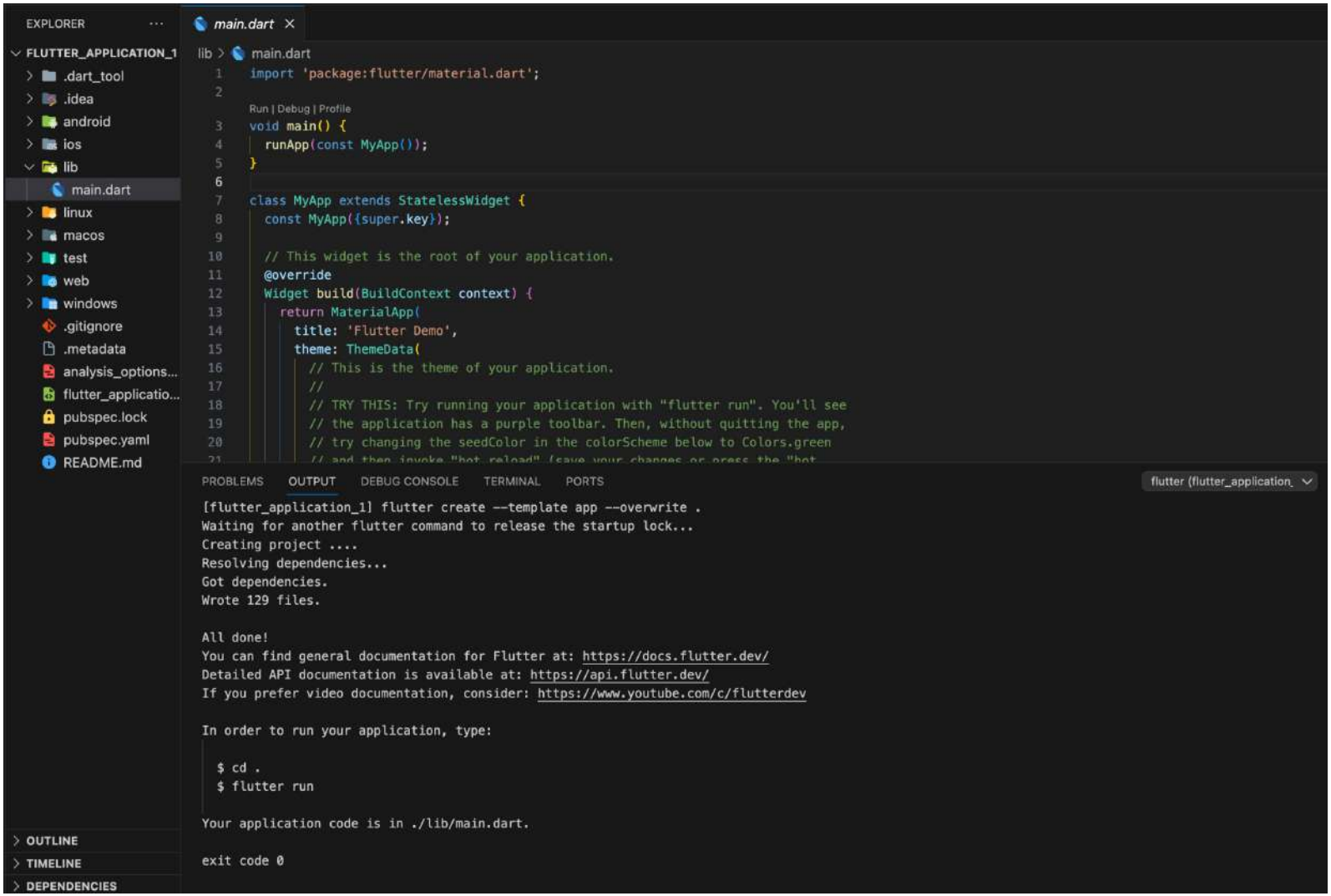
While creating user flows, I brought forward the personas previously created and grouped activities that addressed their specific needs and wants. These groups were then sectioned off to create a distinct activity journey for each persona. By engaging with these tailored activity journeys, the personas were provided with practice in each area required to improve their public speaking skills.



*Impact over effort matrix.

Impact / Effort.

Ahead of prototyping each activity, I decided upon the priority of their development through an impact over effort matrix. The activities which had the most impact with the least amount of effort to create would be developed first, to ensure the most prototypes were made within the deadline.


EXPLORER
main.dart
FLUTTER_APPLICATION_1
.dart_tool
.idea
android
ios
lib
main.dart
linux
macos
test
web
windows
.gitignore
.metadata
analysis_options...
flutter_applicatio...
pubspec.lock
pubspec.yaml
README.md
lib > main.dart
1 import 'package:flutter/material.dart';
2
Run | Debug | Profile
3 void main() {
4 runApp(const MyApp());
5 }
6
7 class MyApp extends StatelessWidget {
8 const MyApp({super.key});
9
10 // This widget is the root of your application.
11 @override
12 Widget build(BuildContext context) {
13 return MaterialApp(
14 title: 'Flutter Demo',
15 theme: ThemeData(
16 // This is the theme of your application.
17 //
18 // TRY THIS: Try running your application with "flutter run". You'll see
19 // the application has a purple toolbar. Then, without quitting the app,
20 // try changing the seedColor in the colorScheme below to Colors.green
PROBLEMS
OUTPUT
DEBUG CONSOLE
TERMINAL
PORTS
flutter (flutter_application_
[flutter_application_1] flutter create --template app --overwrite .
Waiting for another flutter command to release the startup lock...
Creating project ....
Resolving dependencies...
Got dependencies.
Wrote 129 files.
All done!
You can find general documentation for Flutter at: https://docs.flutter.dev/
Detailed API documentation is available at: https://api.flutter.dev/
If you prefer video documentation, consider: https://www.youtube.com/c/flutterdev
In order to run your application, type:
$ cd .
$ flutter run
Your application code is in ./lib/main.dart.
exit code 0
OUTLINE
TIMELINE
DEPENDENCIES

Technical Exploration.

In the concepting phase, after deciding that Recite should be developed for mobile platforms, leveraging the built-in camera, widespread accessibility, and portability, I explored Flutter as a potential development framework. Flutter enables the creation of native iOS and Android applications from a single codebase, which seemed ideal for Recite's cross-platform intentions.

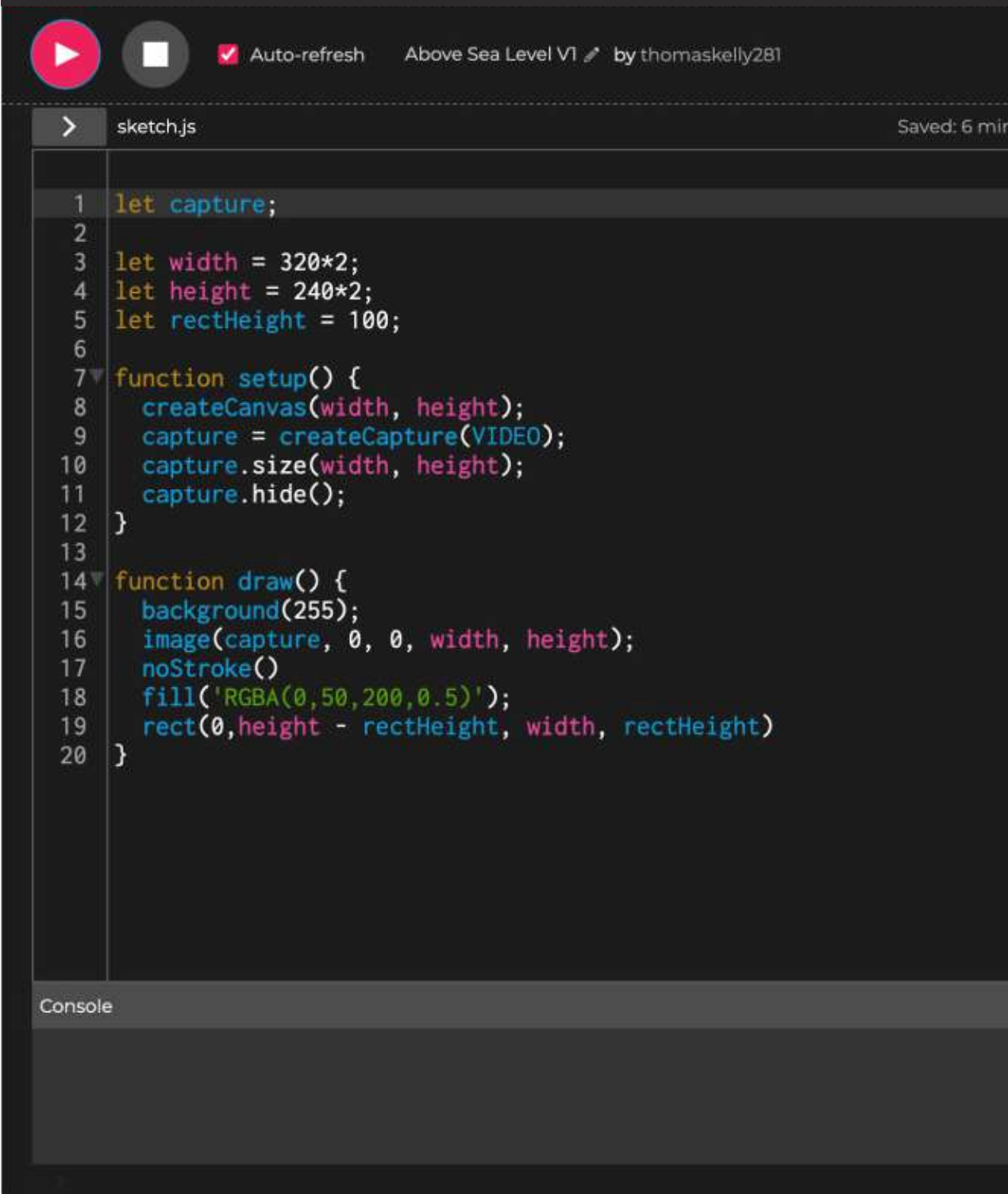
I created a Flutter application but soon had the realisation that Dart, the programming language used by Flutter had a steep learning curve that was not viable for the tight project deadline. Recognising the risk of prolonged development time, I reassessed my approach.

This realisation prompted me to pivot and prototype Recite using HTML, CSS, and JavaScript, technologies with which I had previous experience.
For low-fidelity prototyping, I chose to utilise p5.js, a JavaScript library that facilitates rapid prototyping and makes interactivity easy to accomplish.

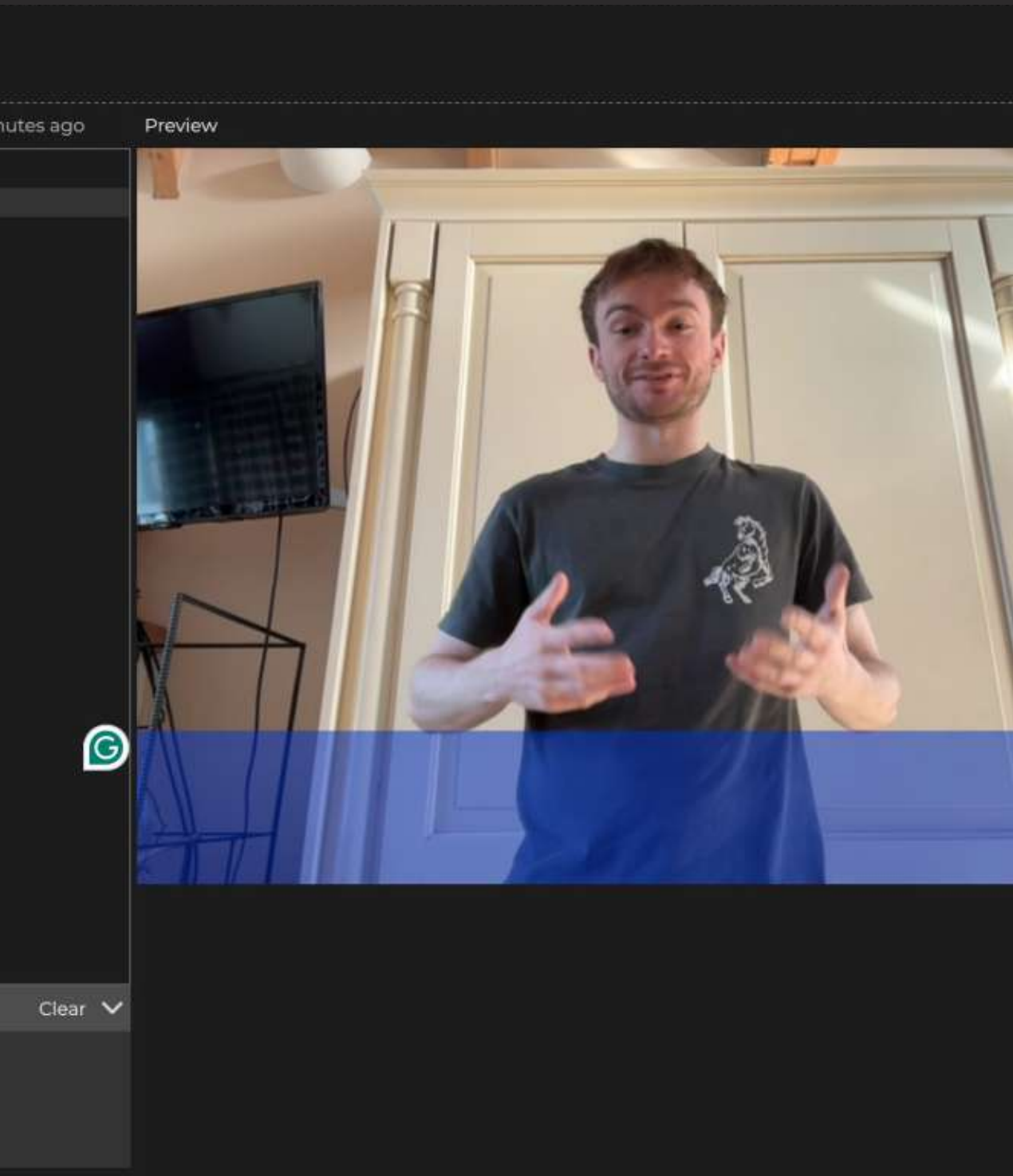
“All speaking is public speaking, whether it’s to one person or a thousand.”

– Roger Love.

Lofi Developme



nt.



*Twister low fidelity prototype being used by a user tester.

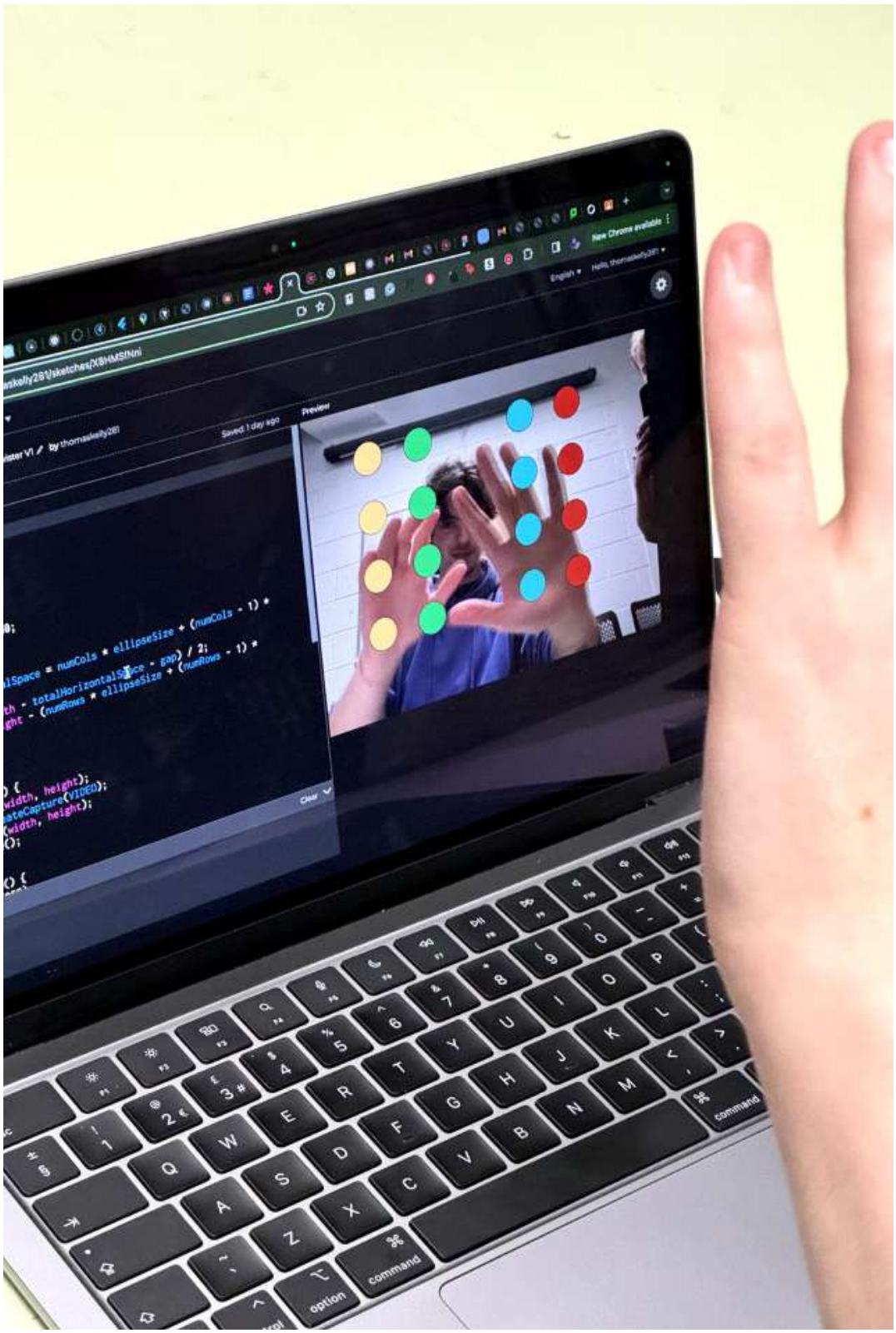
Twister.

Prototype 1.

To prompt users to incorporate arm gestures into their public speaking, I designed an activity inspired by the game Twister, that prompts users to move their left or right hand to a circle displayed on the screen. I presented the user with drawings of which circles they were tasked with moving their hands.

Finding.

From lofi-testing it was observed that the circles had to be placed lower on the screen as the user had to raise their arms above their head to reach the top row. Arms being raised above the presenter's head is not a common occurance in public speaker so therefore prompted altering.



*Twister p5.js prototype being used by a user tester on a laptop.

Twister.

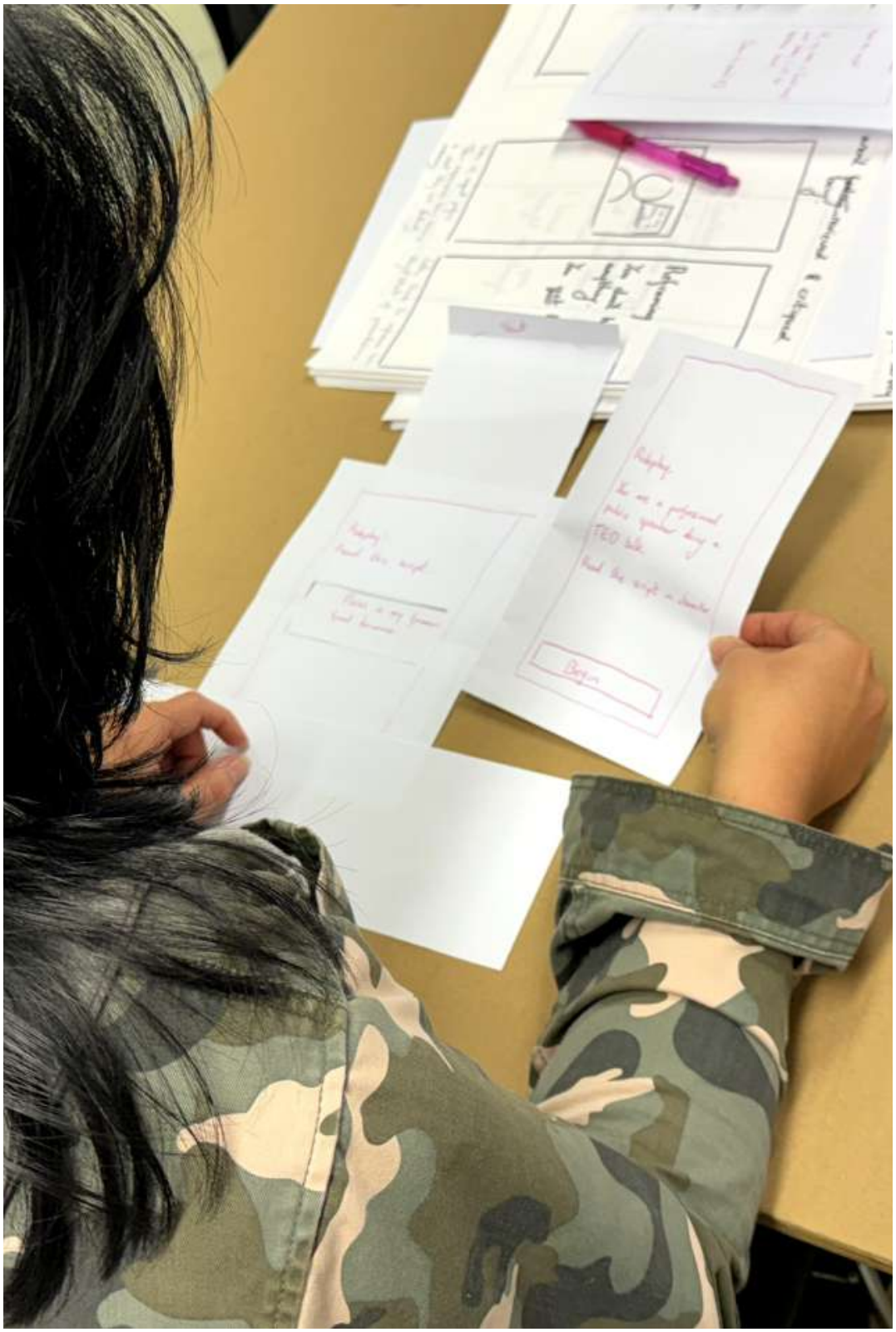
Prototype 2.

Iterating on the first prototype, I created a digital prototype using p5.js. This iteration saw the grid of circles being displayed on the screen similar to before. A random allocation of two circles would be printed in the console for the user to them change their hand position to.

Finding.

Users of this prototype stated it was hard to judge the height of their hands in relation to the circles as they felt a feeling of detachment from the screen. A similar remark from the first prototype test hinted this to be due to a lack of feedback about hand position being correct.

“If the circles highlighted themselves it would be easier.” - User



*Prompt Presentation low-fidelity paper prototype. User tester is holding the paper screens whilst explaining their thought process.

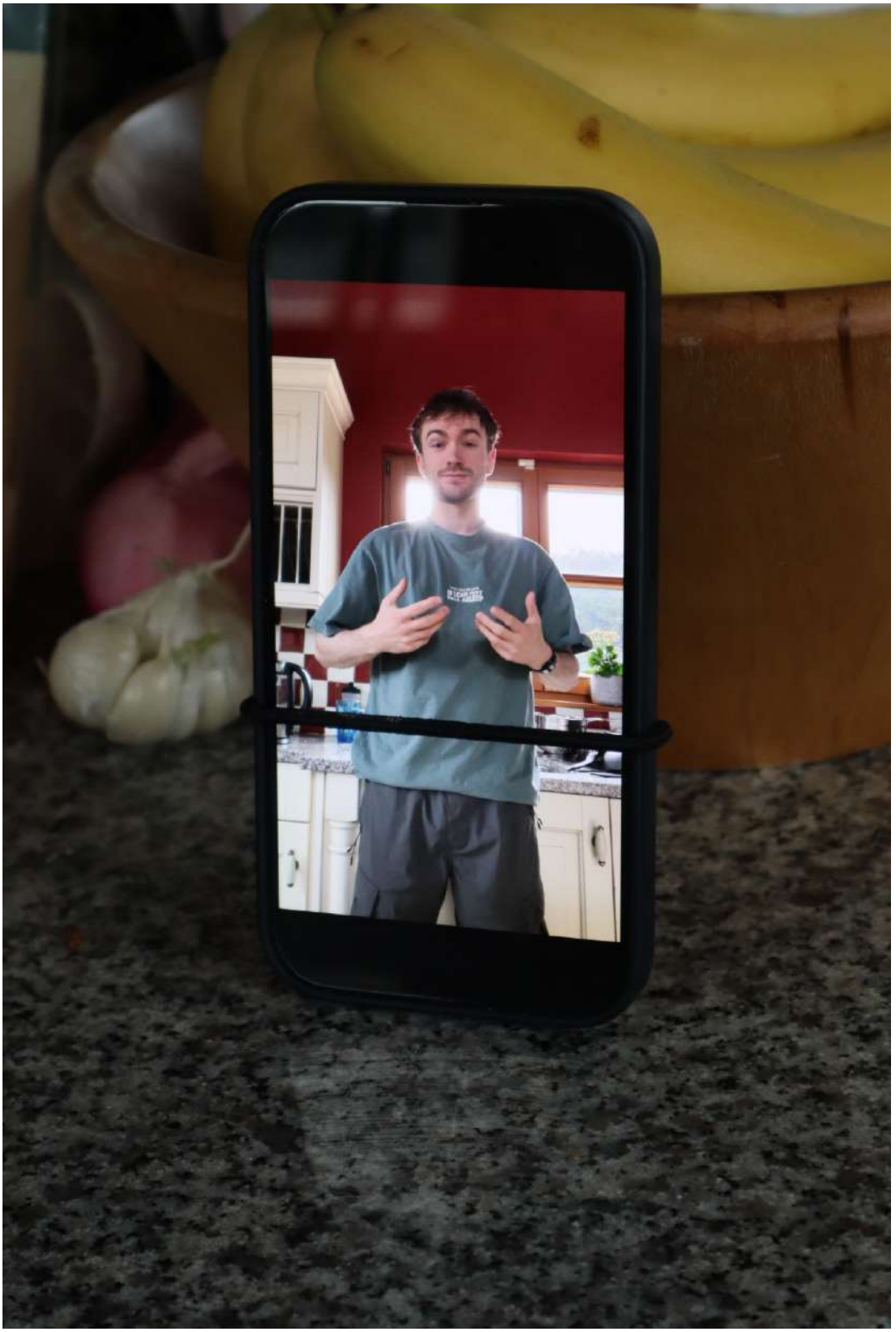
Prompt Presentation.

Prototype.

Attempting to get testers to portray confidence when they do not feel it, I presented them with a character which they were tasked to act. The character prompted was a TED speaker, and their task was to act as if they were giving a TED talk while the script is revealed to them.

Finding.

Users felt the action of tapping to reveal the script interrupted the flow of their speech. When the script was being revealed, the task of acting as a TED speaker was abandoned by the each tester.



*Above Sea-Level low-fidelity prototype shows a mobile phone with a hair-tie wrapped around the lower third of the screen.

Above Sea-Level.

Prototype 1.

To prompt users to elevate their arms to torso height in a low fidelity manner testers were instructed to keep their arms above the height of the elastic band wrapped around the mobile phone.

Finding.

The testers kept their arms above the height of the band. This displayed that it was comfortable for them to do. However, it looked unnatural to the observer.

*Above Sea-Level p5.js low-fidelity prototype shows a wave on the screen with a user tester keeping their hands above the blue rectangle.

Above Sea-Level.

Prototype 2.

A digital version of Above Sea-Level was made using p5.js. Testers were provided with the same prompt as in the first round of testing with prototype 1.

Findings.

This test yielded the same results as with the first prototype. Testers kept their arms above the sea level, which looked unnatural.

Additionally, it was observed that the activity did not work as intended with the user being seated.

p5* File Edit Sketch Help English Hello, thomaskelly281!

Auto-refresh Pitch detection levels by thomaskelly281

Sketch Files

index.html
sketch.js
style.css

sketch.js Saved: just now

```
39 function modelLoaded() {
40   select("#status").html("Model Loaded");
41   getPitch();
42 }
43
44 //Draw on the canvas
45 function draw() {
46   //Use the volume from the microphone to control the size
47   vol = mic.getLevel();
48   if (vol > 0.005) {
49     let speed = 10;
50     let y = map(midiNum, 20, 100, height, 0);
51     // rect(xCurrentNote, y, speed, height / 100);
52     ellipse(xCurrentNote / 2, y, height / 10, height / 10);
53     if (xCurrentNote < width - speed) {
54       xCurrentNote += speed;
55     } else {
56       copy(speed, 0, width-speed, height, 0, 0, width - speed,
   height);
57       fill(200);
58       noStroke();
59       // rect(width - speed, 0, speed, height);
60       ellipse((width - speed) / 2, 0, height / 10, height / 10);
61     }
62   }
63 }
64
65 //Get the pitch, find the closest note and set the fill color
66 function getPitch() {
67   pitch.getPitch(function (err, frequency) {
```

Console Clear

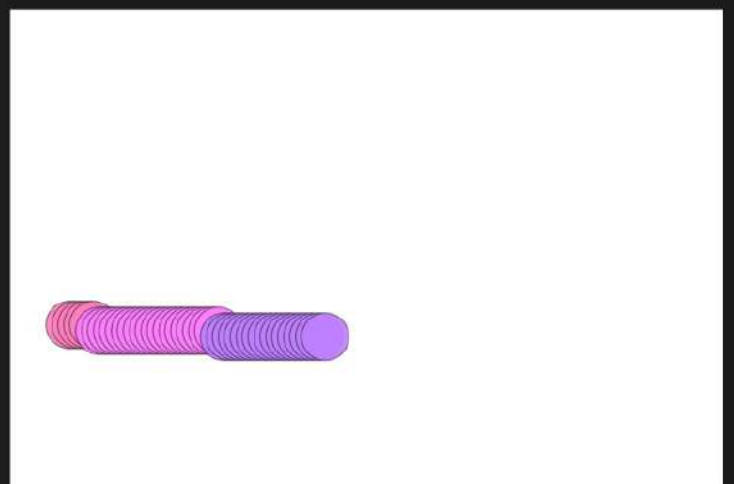
p5.js says: you have used a p5.js reserved function 'speed' m
ake sure you change the function name to something else.

Preview

Model Loaded

Make a noise (i.e. sing, hum, whistle, play an instrument) to have the detector predict your pitch and use the mouse to create a painting from your sounds.

Note: A - midi 45 - volume 0.02



Pitch Perfect.

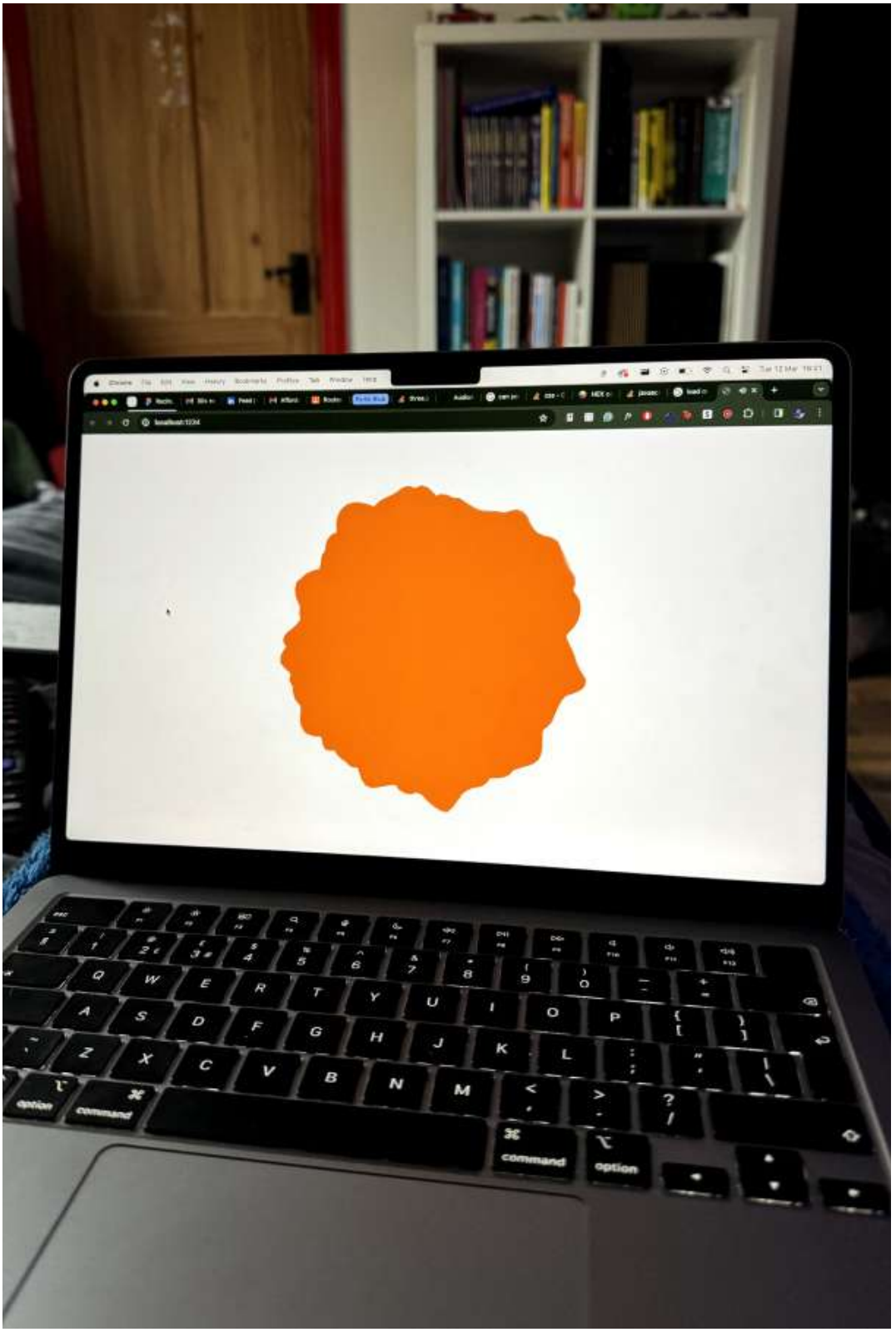
Prototype 1.

The Pitch Perfect activity was aimed at improving users' awareness of their vocal variety, and vocal projection.

The first prototype used p5.js to map the pitch level with a ball that changed height and colour depending on vocal pitch.

Findings.

Testers reported that the user interface (UI) was unintuitive and lacked sufficient information. They highlighted the absence of feedback mechanisms, noting that there was no indication of whether they were performing well or poorly.



*Pitch Perfect interactive prototype shows a Three.js sphere with a depth map using perlin noise changing height depening on microphone input.

Pitch Perfect.

Prototype 2.

The prototype was altered to use Three.js to create a mesh sphere which used a noise map to create a blob texture. The height of the noise was determined by the pitch of the user's input.

Findings.

The technology used was limited in its capacity to use pre-recorded clips and not real-time microphone input. No value could be forseen from user testing, however, it was a useful evaluation of technology that could be used.

“To sway an audience, you must watch them as you speak.”

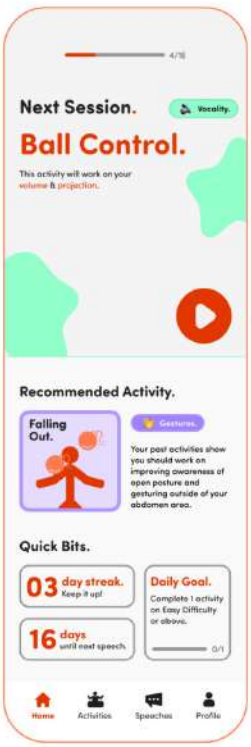
– C. Kent Wright.

Interactive Prot

Home Activities Speeches Profile

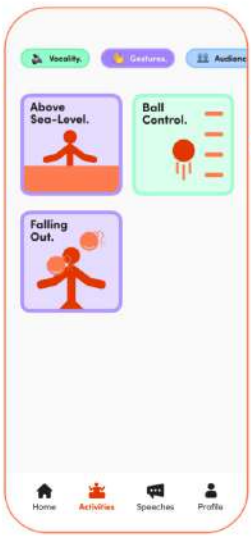
Home.

The home screen contains navigation to the next activity in the user's journey to improve their public speaking features.



Activities.

The activities screen contains each activity the user has already completed as part of their improvement journey. Each activity is available to be replayed



Speeches.

Users are afforded the ability to create custom activity journeys based on an upcoming speech or their intention to improve certain specific aspects of their public speaking ability.

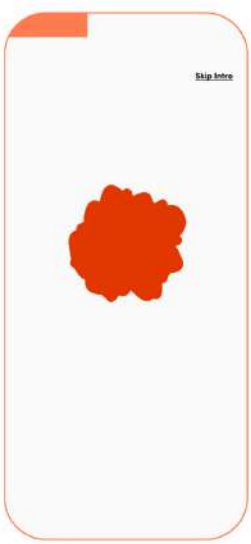
Profile.

The user's profile page displays their progress towards completing their activity journey, and a breakdown of metrics and achieved completed.

See Custom Journey Task Flow.

Intro Video.

Each activity when first selected will play an introductory video on the importance of the public speaking feature it is addressing, and how to use the activity.



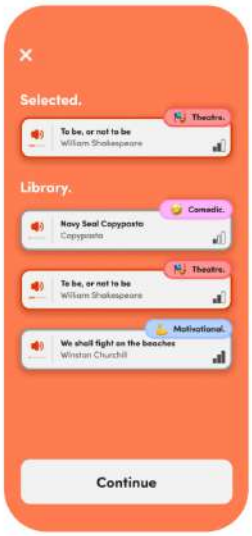
Activity Menu.

The activity menu allows for the user to select the activity difficulty and the speech they wish to present. An explanatory video of how to play the activity is looped.

otype 1.

Select Speech.

Users can select which speech from the set library they wish to present while playing the activity. Each speech is labelled by its difficulty and its content type.



Loading Screen.

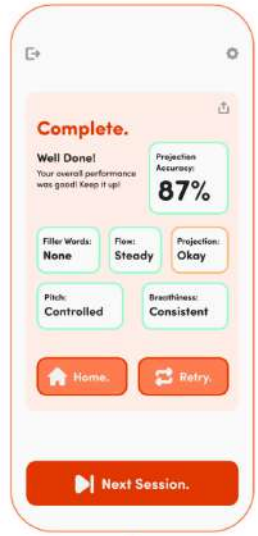
Loading screens display a randomised quote about public speaking by notable figures.

Activity.

Activities will display the script text a quarter of the way down the screen. The progress bar on the top of the screen displays how long each line of the script will be displayed for, allowing the user to keep their timing.

Activity Compete.

Once an activity is complete, the user will be presented with a breakdown of metrics from their performance to prompt self-reflection after the activity.



Exit Screen.

Should the user choose to exit an activity, they will be prompted a 'Yes' or 'No' alert to enquire their intentions.

Base Stance

Thomas Kelly

Just Dance-esque Silhouette

Thomas Kelly

Above Sea-Level

Thomas Kelly

Twister Alternative

Thomas Kelly

Pitch & Resonance

Thomas Kelly

Flow of Speech & Pacing

Thomas Kelly

Volume & Projection

Thomas Kelly

Mini Presentation

Thomas Kelly

Left Hanging (w/ video intro)

Thomas Kelly

One word at a time

Thomas Kelly

One word at a time with a role-play prompt

Thomas Kelly

Flow & Pacing (ad lib, improv)

Thomas Kelly

Volume and Projection (ad lib, improv)

Thomas Kelly

Final Presentation

Thomas Kelly

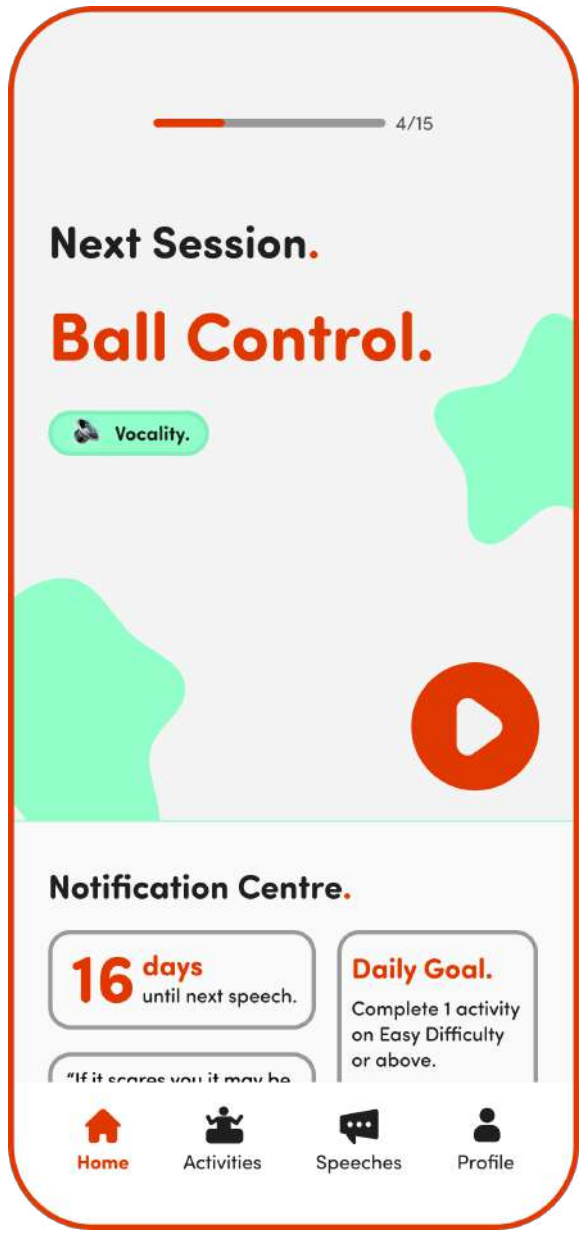
Defining Activities.

The order in which users would be directed through the activity journey was organised as can be seen to the left.

Activities are organised by feature type, consisting of...

- Vocality
- Gestures
- Mindset
- Audience
- Ad Lib
- Presentation Practice

The order of the activities was decided upon by considering the most visual aspects first which for some will come more naturally and faster and arguably require less nuance and practice.


4/15
Next Session.
Ball Control.
Vocality.
Notification Centre.
16 days
until next speech.
Daily Goal.
Complete 1 activity
on Easy Difficulty
or above.
Home
Activities
Speeches
Profile

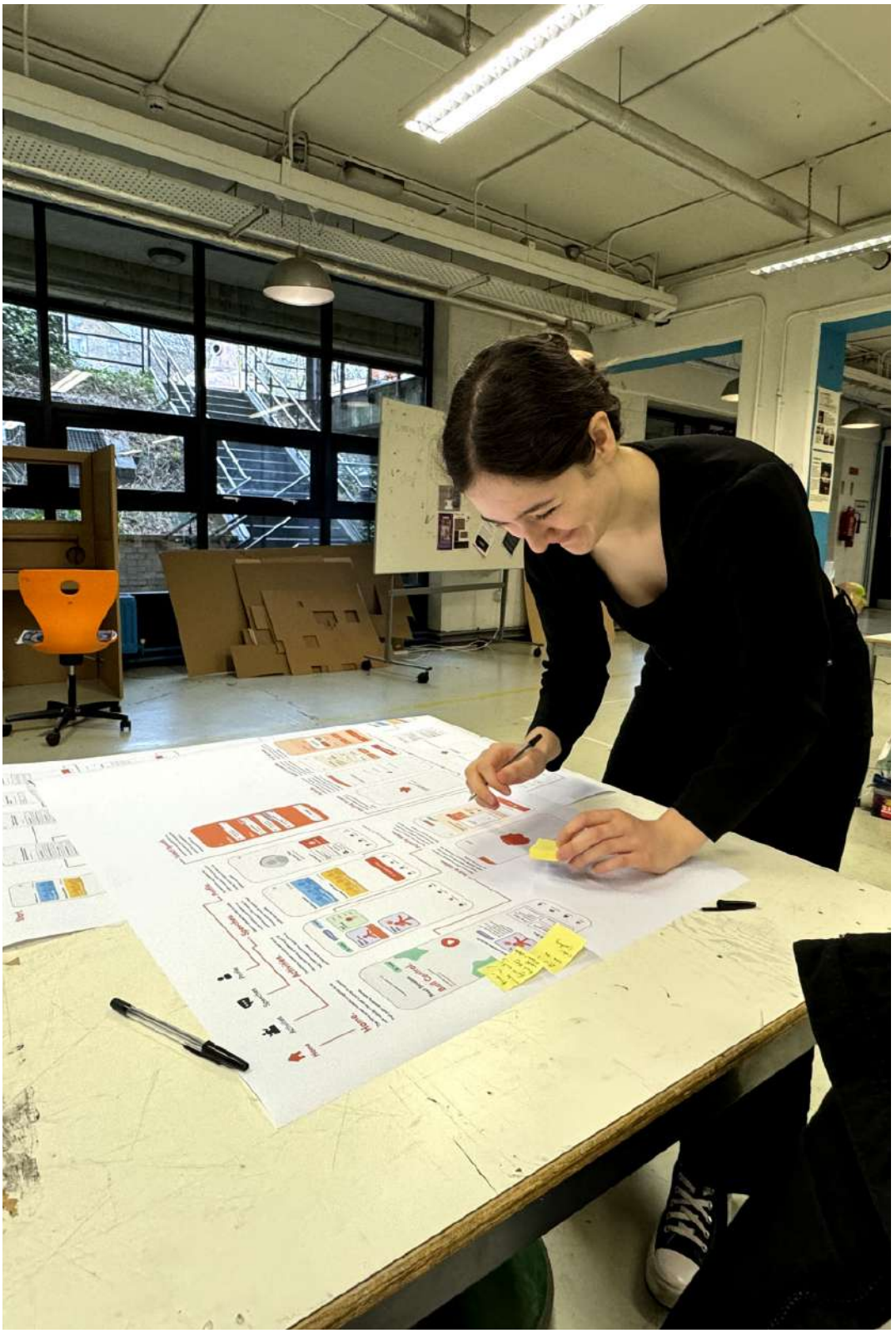
Designing the UI.

A vibrant shade of orange (#E13700) was selected as the primary colour for the application due to its eye-catching quality, ensuring key features and navigation elements are immediately noticeable.

For activities within the vocality category, such as ball control (illustrated on the left), a bright green (#92FFCB) was employed to differentiate them from other types of activities. This colour coding strategy adheres to the principle of recognition over recall, aiding users in quickly identifying activity types based on colour alone.

Similarly, activities focused on gestures were designated with a purple hue (#B297FF), while those involving audience interaction were marked in blue (#80CAFF).

The font family chosen for the application is Sofia Pro Soft. Its friendly, rounded appearance contributes to an unintimidating and educational tone.



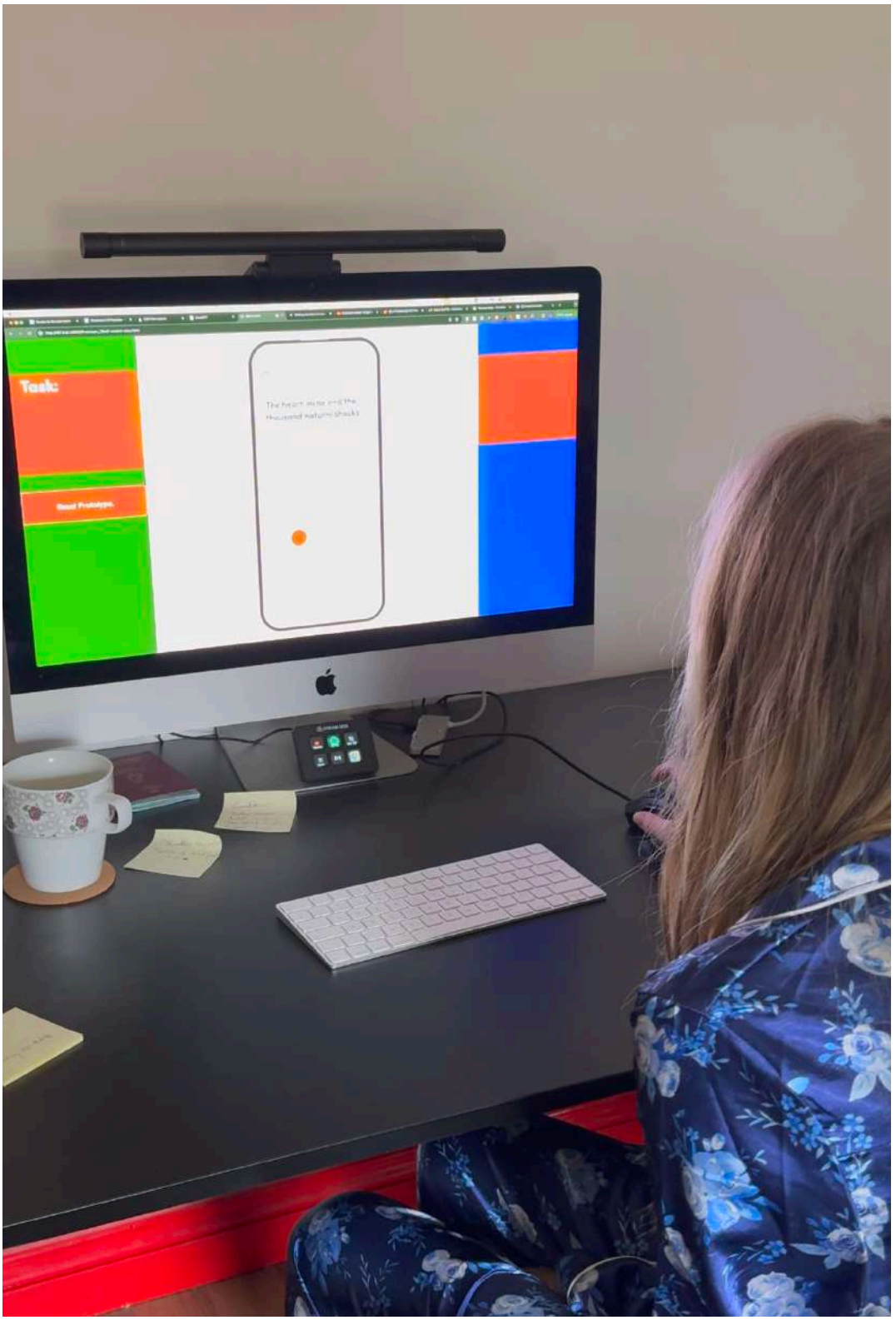
*Fellow interaction designer and user tester for the product making notes of issues and confusion around the Recite's screen flow

Feedback on UI.

Feedback gathered from fellow designers in the studio space and user testers led to the consensus that the UI required a comprehensive redesign following the testing of this version's activities.

Specifically, sections like the notification centre were found to be unclear and not self-explanatory, indicating a need for more intuitive design elements that could be easily understood by users without additional instructions.

Furthermore, the aesthetic choices of UI components, such as the activity selection tiles, were unfavorable with testers.

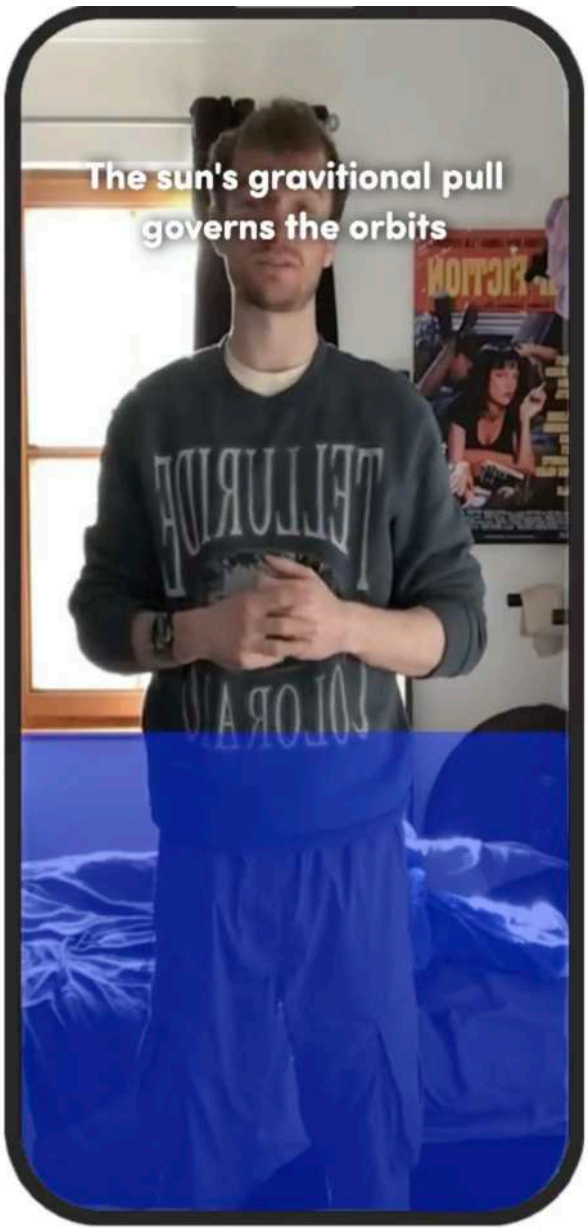


*User tester playing through the Ball Control interactive prototype.

Ball Control.

To develop an interactive version of the “Ball Control” activity, which aids in vocal projection by providing users with visual feedback on their speaking volume, I utilised p5.js. This JavaScript library enabled me to create ellipses that dynamically adjust their y-position on the canvas in response to the microphone input level.

Users receive context on their speaking loudness through visual signifiers positioned on the right-hand side of the screen. These are clearly labeled to correspond with different speaking volumes: “quiet conversation,” “regular conversation,” “small audience,” and “large audience.” This design ensures that users can easily gauge their vocal output against typical speaking environments, enhancing their ability to modulate their voice according to the intended audience size.


The sun's gravitional pull
governs the orbits

Above Sea-Level.

An interactive version of “Above Sea-Level“, the activity that prompts users to keep their arms up, was made using MediaPipe Hands, a JavaScript hand-tracking library, and CSS animations.

When the user’s hand got close to the level of the sea. The hand tracking prompted a rising animation from the sea.

Hand Tracking.

I conducted different experiments using hand tracking, trying different libraries, models and styling for the tracking.

The first test was with TensorFlow Handpose, while this solution was easy to set up, it had the limitation that it could only track one hand.

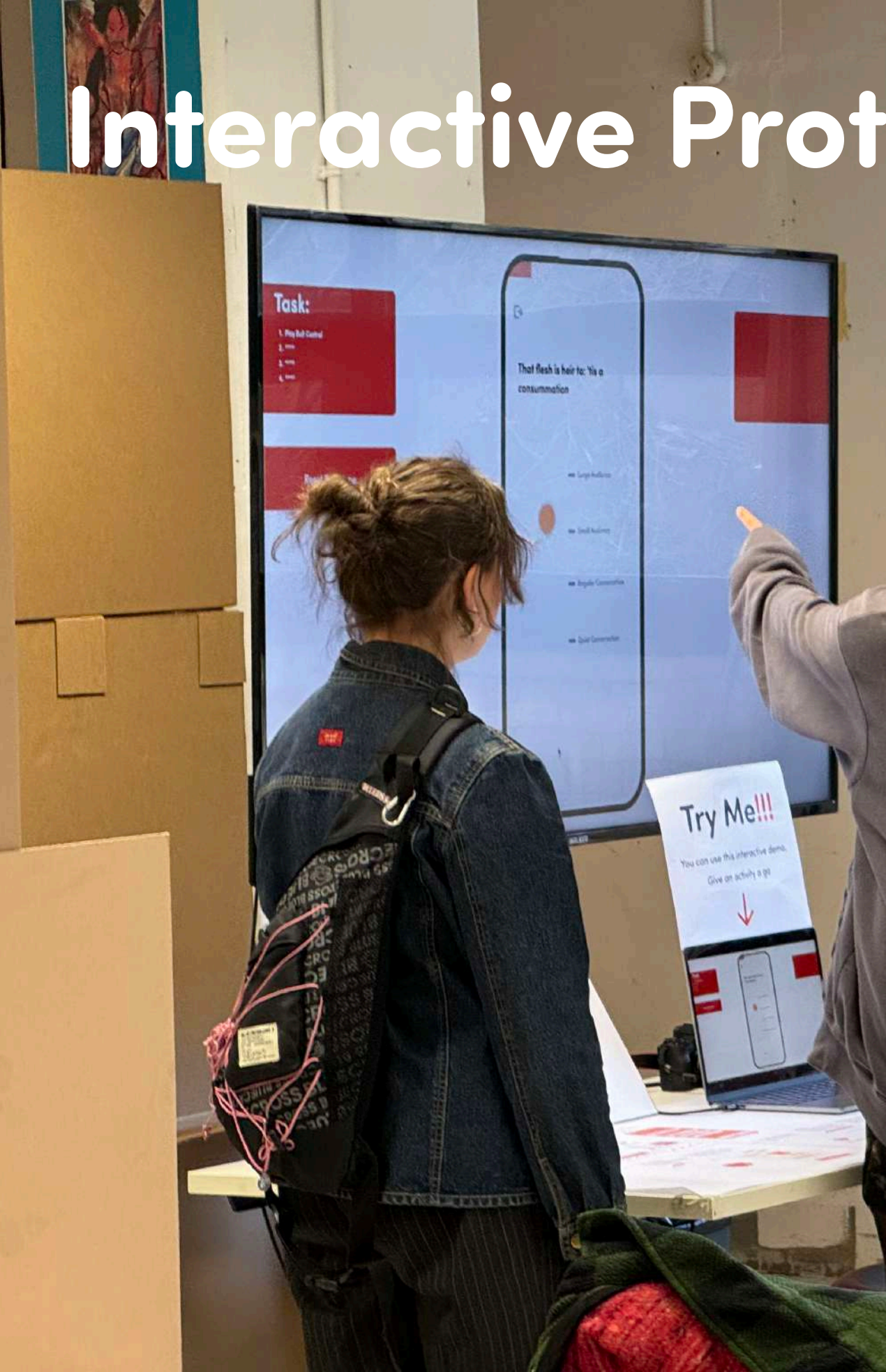
Other tests used MediaPipe Hands, a library I had previous experience using, but, this time I used the version for the web, written in JavaScript, rather than the Python version. This afforded an easier connection between the HTML webpages and the interactive hand tracking.

The ellipse (as seen in the image to the left) was drawn to the canvas using the central point of each of the points tracking the user's hand.

“Communication works for those who work at it.”

– John Powell.

Interactive Prot



otype 2.

Intro Video

Vocality.

Ball Control.

Volume - Projection

Easy.

Medium.

Hard.

Lifeline: Background Audio.

Obstacle: None.

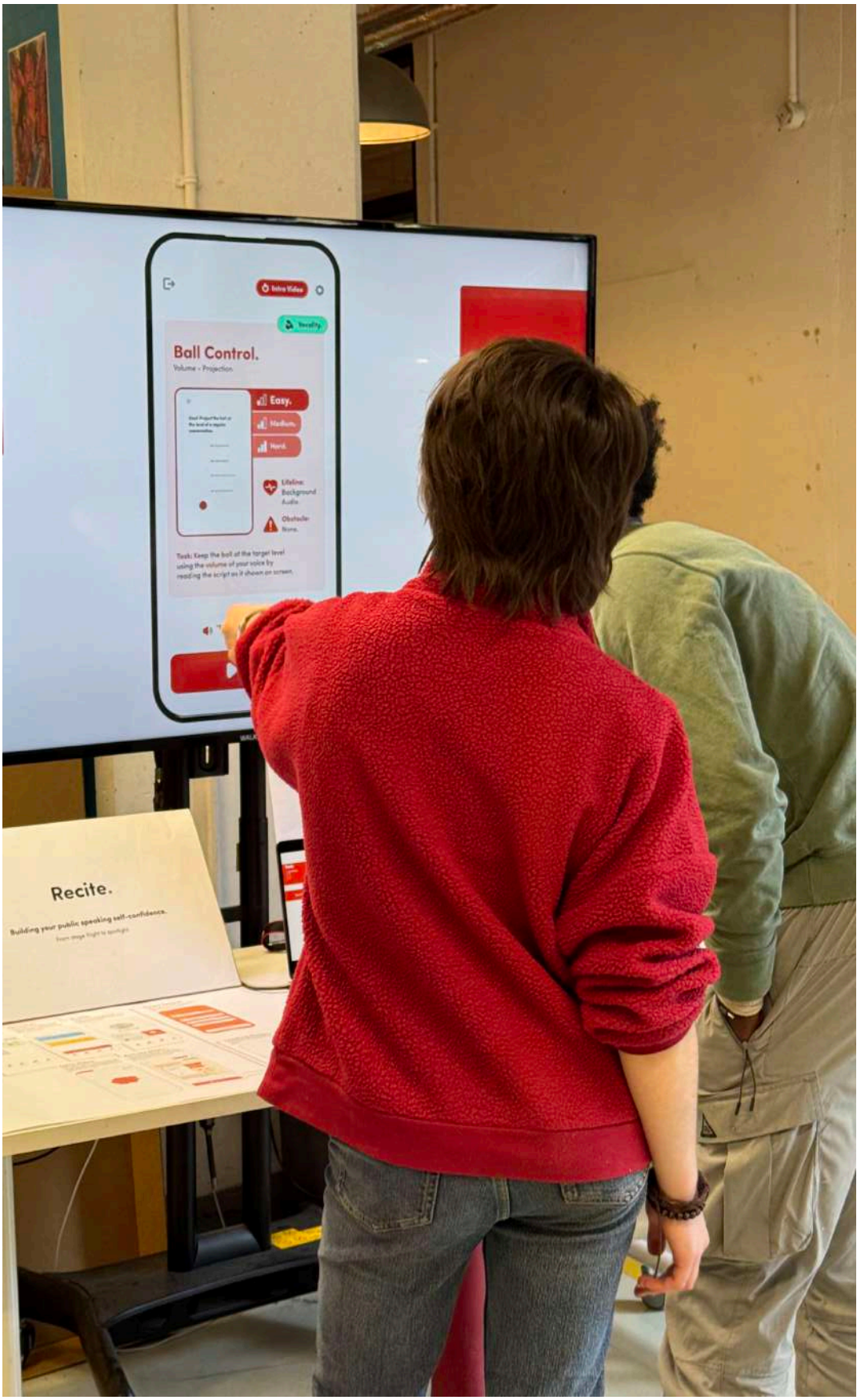
Task: Keep the ball at the target level using the volume of your voice by reading the script as it shown on screen.

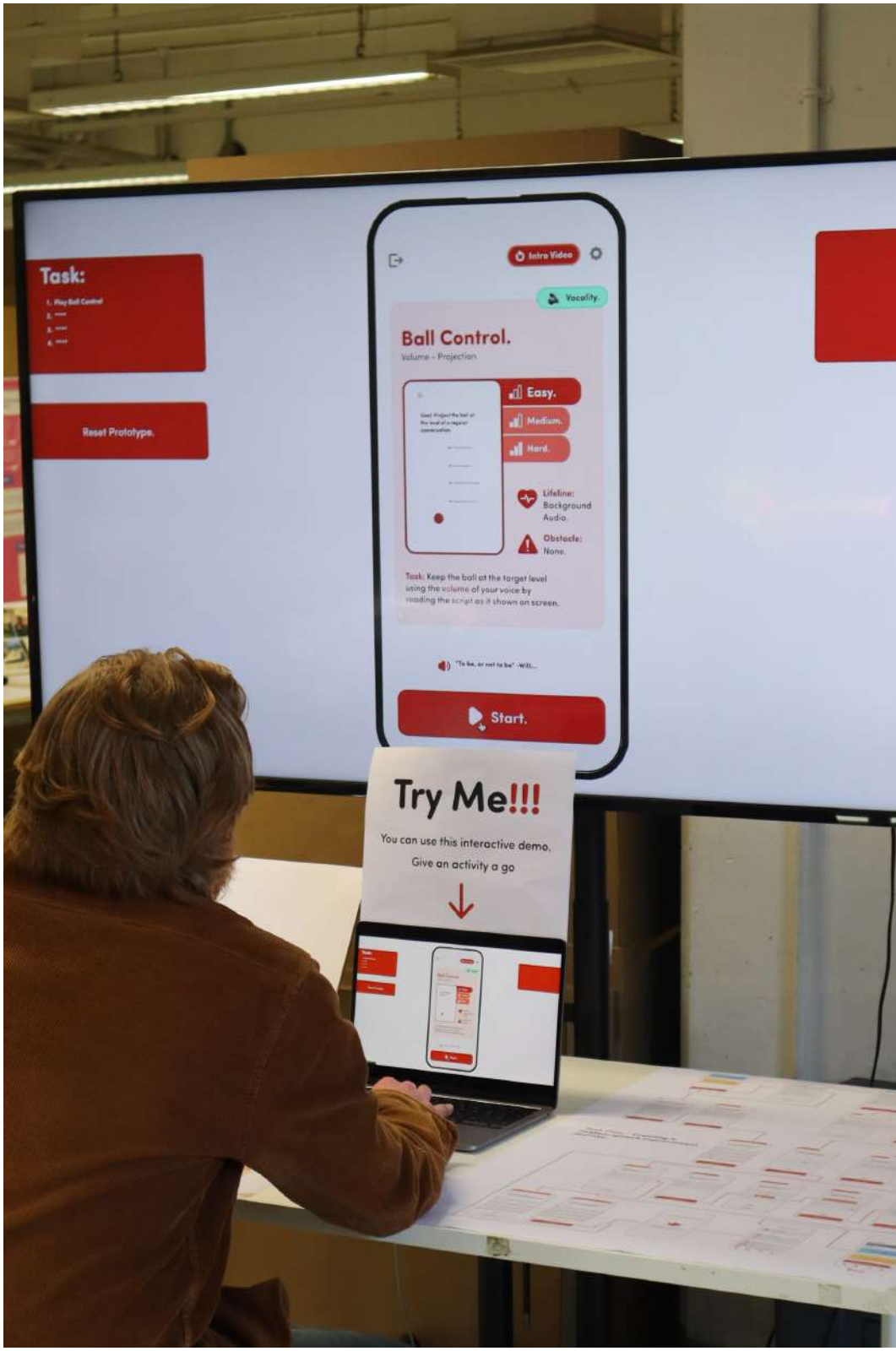
"To be, Or not to be" -Will...

Start.

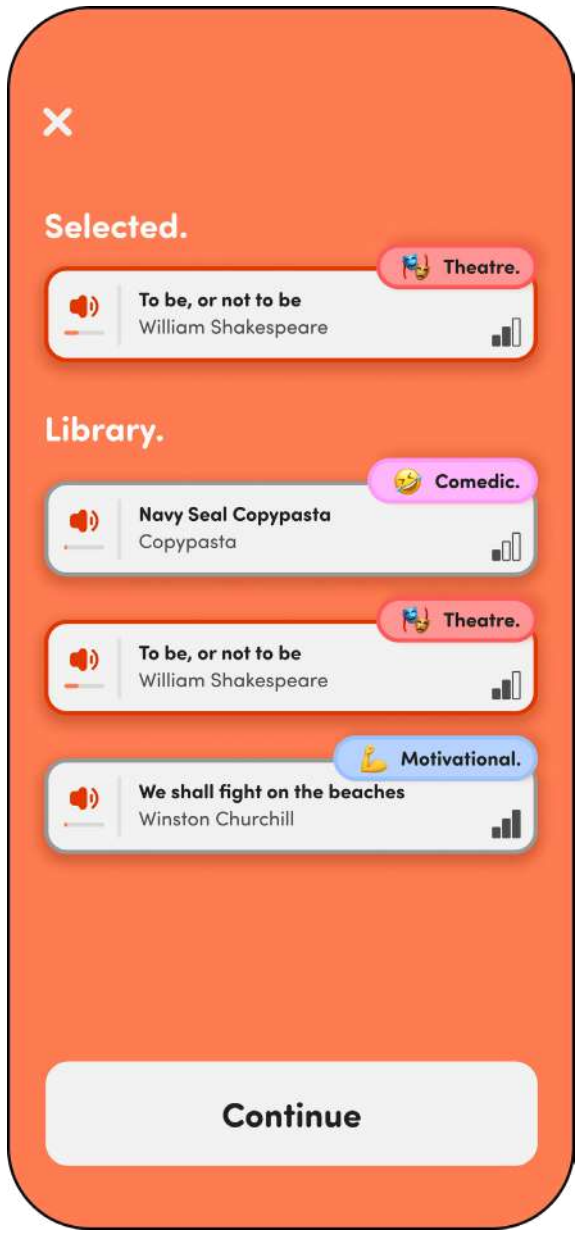
Introduction Page.

To ensure users understood how to engage with the selected activity, I designed an explanatory introduction page. This page featured a looping video demonstrating the activity in action, alongside a clear text description that outlined the instructions for interaction and detailed the specific task to be accomplished. This dual-modality approach, combining visual and textual guidance, was intended to cater to different learning styles, thereby enhancing comprehension and ease of use.


Intro Video
Vocality
Ball Control.
Volume - Projection
Easy.
Medium.
Hard.
Lifeline:
Background
Audio
Obstacle:
None.
Task: Keep the ball at the target level
using the volume of your voice by
reading the script as it shown on screen.
Recite.
Building your public speaking self-confidence.



*Users reading through in explanatory introduction page added in this prototype.


Selected.
Theatre.
To be, or not to be
William Shakespeare
Library.
Comedic.
Navy Seal Copypasta
Copypasta
Theatre.
To be, or not to be
William Shakespeare
Motivational.
We shall fight on the beaches
Winston Churchill
Continue

Select Speech Page.

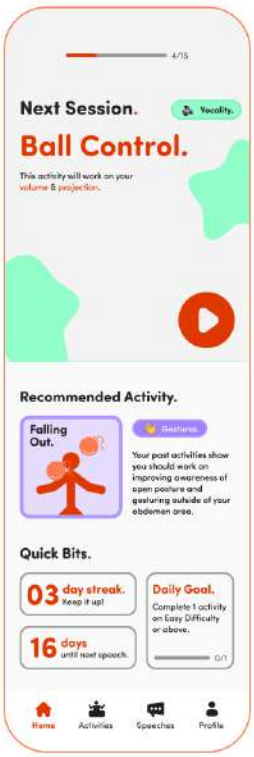
By pressing the speech title located at the bottom of the screen, users were directed to the speech selection page.

On this page, users could choose from multiple speeches, each affecting the duration and difficulty of the activity. The speeches were organised into categories based on their tone, facilitating easier navigation.

Home Activities Speeches Profile

Home.

The home screen contains navigation to the next activity in the user's journey to improve their public speaking features.



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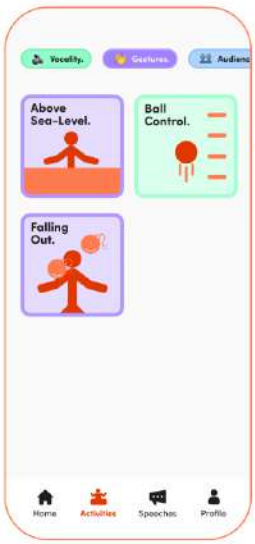

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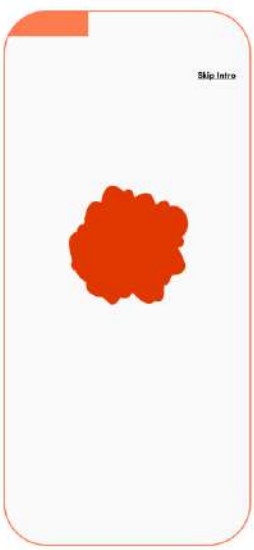

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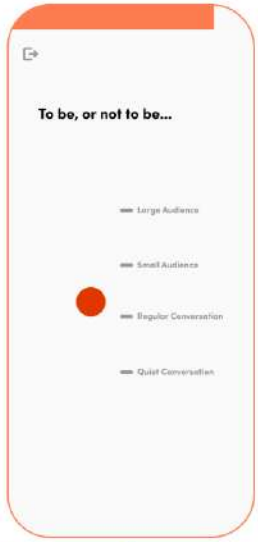

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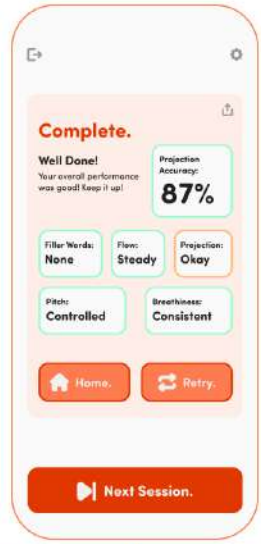


Exit Screen.

Should the user choose to exit an activity, they will be prompted a 'Yes' or 'No' alert to enquire their intentions.

*MediaPipe hand tracking being implemented onto the template page.

Coding Template.

Following the feedback received on the initial interactive prototype, I developed HTML template pages to ensure consistency across all prototype activities and navigational pages. This measure addressed concerns regarding the lack of consistency, which had been a significant point of feedback.

Additionally, I placed emphasis on enhancing system visibility, whilst responding to user feedback that indicated confusion and a feeling of being in a “state of limbo” with the previous prototype. To address this, I implemented visual cues such as ellipses that followed the tracked movements of users’ hands, providing immediate visual feedback on their actions. Furthermore, I introduced notifications to inform users when machine learning models were loading, particularly noting that this process could take approximately 25 seconds. These adjustments were aimed at improving the user experience by making system processes transparent and providing clear, real-time feedback to keep users informed and engaged throughout their interaction with Recite.

Evaluation.

For the evaluation of the prototype's efficacy, I conducted a controlled test involving three participants: one control subject, one subject who engaged in standard practice (rote memorisation) for 10 minutes, and one subject who used prototype 2 for an equivalent duration (n=3).

Pre- and Post-practice, the speeches were recorded using a mobile phone and subsequently presented to a judging panel in a random sequence. The panellists were instructed to rate each subject's presentation skills and confidence levels using a Likert scale ranging from one to ten.

The results indicated that the subject who utilised prototype 2 exhibited the most consistent performance, with no fluctuation in the judges' scores. The subject who practiced traditionally showed a minimal score fluctuation of 0.5. While acknowledging the limitations due to the small sample size, this preliminary test was effective in determining whether the prototype could potentially match or exceed the effectiveness of standard practice methods. The findings suggested that prototype 2 did indeed have a comparable impact on performance enhancement.

“It’s alright to have butterflies in your stomach. Just get them to fly in formation.”

– Rob Gilbert.

Interactive Prot

Stages Complete.

Congratulatory message notifying the user of their completion of all stages in the activity.

Feedback.

Quantitative feedback of their performance compared to a professional public speaker, and a breakdown in performance of stage 1 and 4.

Prototype 3.

Start.

Explainer.

Intro GIF and speech from narrator overviewing what the user will focus on and learn.

Framing.

Signifier and prompt used to move the user to the correct position for detections to be made.

Stage Title.

Title of the stage the user is currently undertaking. The narrator reads this aloud.

Stage Intro.

Explanation of what the user will under take in the current stage.

Activity.

The activity to improve the selected public speaking feature.

Stage Complete.

Congratulatory message and a preview of the next stage.

“It’s all about building confidence over time.”

The Journey.

From the evaluation experiment conducted on the second interactive prototype, along with feedback from individual user testing, it became evident that users felt unsupported in their efforts to improve through standalone activities, particularly when unsure of their abilities.

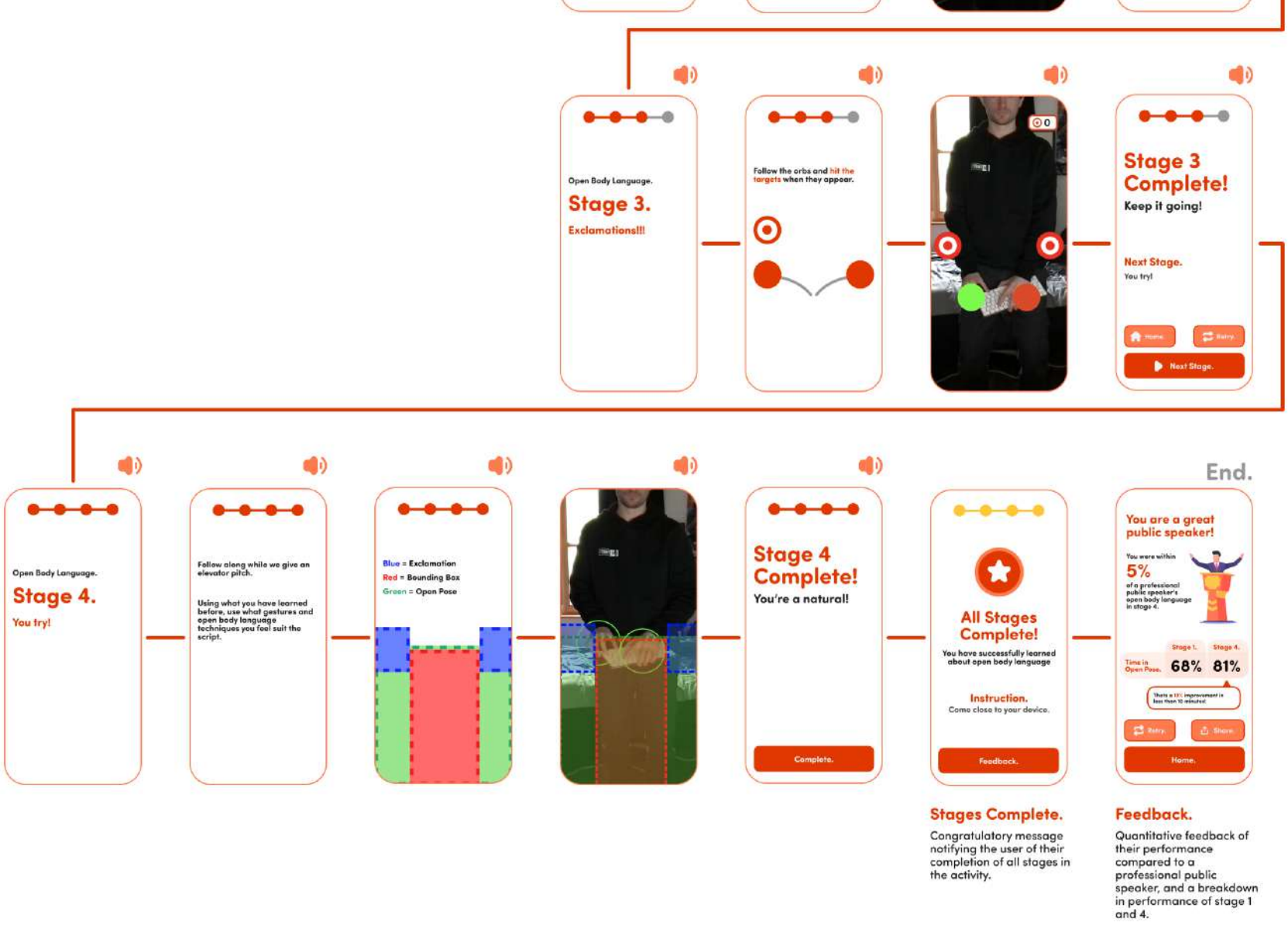
To address this concern, I began exploring models of sustained and structured support in educational design. A compelling analogy was found in the traditional school system, where learning is structured across semesters with progressively challenging tasks. This gradual, cumulative approach to learning helps build confidence and competence over time.

Drawing inspiration from digital platforms, I looked at Duolingo as an exemplary case of this educational philosophy applied in an application setting. Duolingo effectively uses repetition and graduated difficulty to engage users, encouraging continuous improvement over extended periods. This model seemed particularly well-suited to adapt for enhancing our application, aiming to provide a more supportive and progressively challenging learning environment for users.

Arm Movement.

In response to user feedback and insights from educational models, I redesigned the application to incorporate a journey or timeline-style navigation through activities. This approach was aimed at gradually introducing users to the various aspects of public speaking, providing a structured path that supports continuous learning and skill development.

Given that several activities were designed to focus on arm movement, such as “Above Sea-Level,” “Falling Out,” and “Twister,” I decided to prototype this new journey-style navigation by creating an “Arm Movement” journey. This journey comprised four activities, each specifically designed to progressively build the user’s confidence and proficiency in using arm movements effectively during public speaking. This structured approach ensures that users are not overwhelmed and receive targeted practice that builds on previous lessons.



Stages Complete.

Congratulatory message notifying the user of their completion of all stages in the activity.

Feedback.

Quantitative feedback of their performance compared to a professional public speaker, and a breakdown in performance of stage 1 and 4.

Open Body Language Activity Task Flow.

= Narration present

Start.

Explainer.

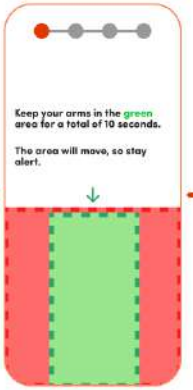
Intro GIF and speech from narrator overviewing what the user will focus on and learn.

Framing.

Signifier and prompt used to move the user to the correct position for detections to be made.

Stage Title.

Title of the stage the user is currently undertaking. The narrator reads this aloud.



Stage Intro.

Explanation of what the user will under take in the current stage.

Activity.

The activity to improve the selected public speaking feature.

Stage Complete.

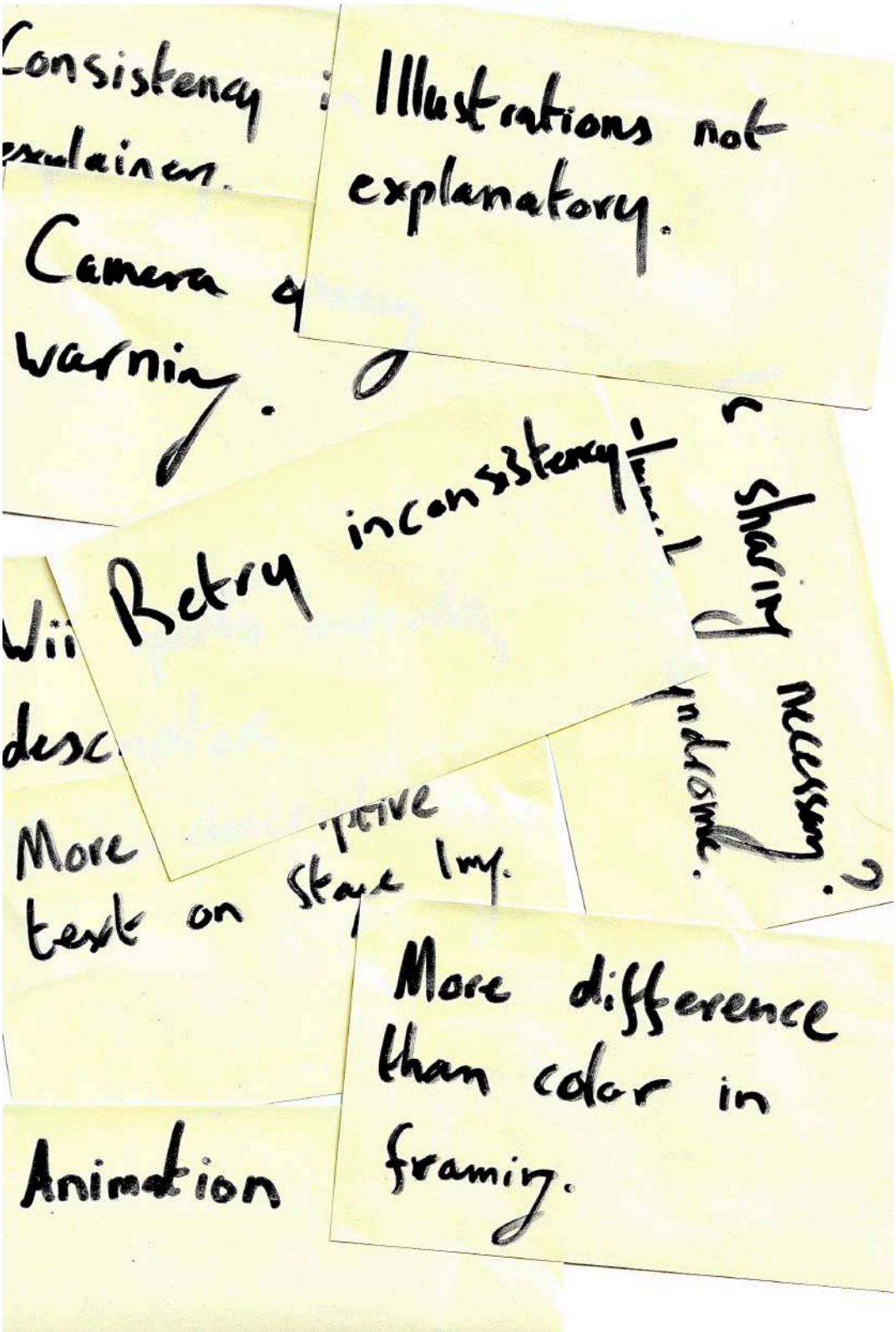
Congratulatory message and a preview of the next stage.

“With everything going on, I think you are visually overloading the user.”

Removing the script.

In the development of the third interactive prototype, I decided to remove the feature that allowed users to change the script during gesture-based activities. This adjustment was based on observations and feedback that simultaneously reading a speech and performing gesture tasks imposed excessive visual and cognitive load on users. This overload hindered their ability to concentrate effectively on mastering the gesture aspect of the activity.

By simplifying the interface and reducing task complexity, the focus was redirected solely towards enhancing gesture proficiency. This change aimed to foster a more focused and effective learning environment, allowing users to develop their public speaking skills without the distraction of multitasking between reading and gesturing.



*Sticky notes of UI feedback from designers.

UI Feedback.

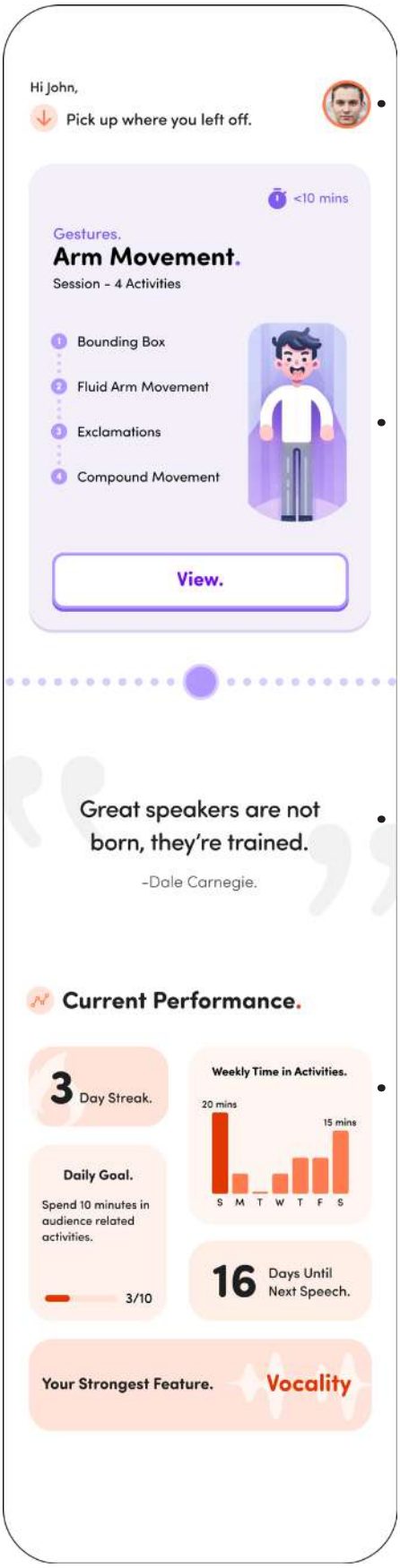
During a UI feedback session involving other designers who had experience using the application, I gathered valuable insights into necessary changes concerning navigation and interactions throughout the application. A key issue highlighted during this session was the lack of consistency in the language and terms used across different activities.

Recognising the importance of uniform communication within the application, I later revised these inconsistencies.

“Courage is what it takes to stand up and speak, and to sit down and listen.”

– Winston Churchill.

Interactive Prototype 4.



- Navigation to the user's profile page. This was removed from the navigation bar in this version.
- Card to show current journey progress and which activities will be contained in the upcoming session.
- Daily quote about public speaking from notable figures.
- Breakdown of user's current performance in the form of a bento grid. Tiles will be changed depening on the biggest variations in data and th emost notable statistics.

Homepage.

In the latest update, the homepage of the application was redesigned to prominently feature the activity journey in the splash area at the top of the page. This strategic placement ensured that users were immediately drawn to the core feature of the application.

Furthermore, the user profile page has been repositioned from the navigation bar to the homepage due to it not being a frequently visited page. By relocating it to the homepage, the navigation bar was streamlined while still keeping the profile readily accessible for users.

Text throughout Recite is of an AAA (triple A) contrast rating standard to ensure readability from far.

Accessibility.

The integration of mixed media throughout Recite necessitates comprehensive accessibility considerations. While the current prototype was developed under tight deadlines, accessibility was a constant focus during the design process. However, certain accessibility features that required extensive coding were not prioritised solely to adhere to these time constraints.

For instance, activities designed around arm movement and vocality have been adapted to accommodate users with physical or vocal challenges. Arm movement exercises are structured so they can be completed using only one hand, and vocality tasks can be passed without necessarily using the user's voice. Plans to allow users to entirely skip these sessions if they find them too challenging are slated for future updates to enhance accessibility further.

Currently, the application does have notable accessibility gaps, particularly the absence of audio transcription and captioning. This omission was a deliberate decision made to meet project deadlines but is recognised as a significant shortfall that needs to be addressed in subsequent versions of Recite. Implementing these features will ensure that the application is more inclusive, catering effectively to users with hearing impairments and providing a more accessible user experience.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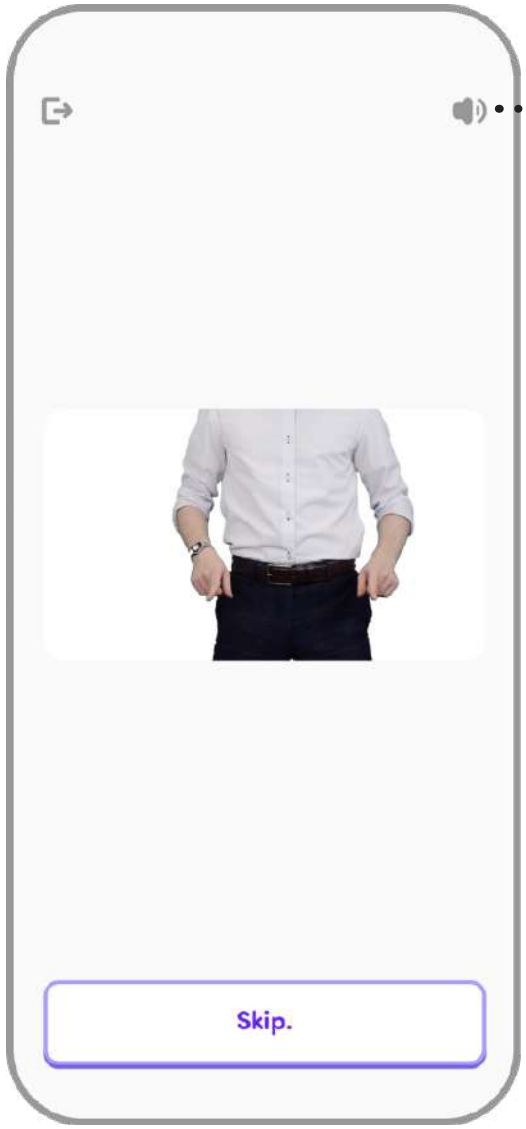

Skip.

Heuristics.

A heuristic evaluation was conducted on the preceding prototype during the design phase of this prototype.

Recognition Over Recall.

The compound movement activity was redesigned to more closely resemble the other arm movement activities, making it more consistent both in colour and in visual aids.

Visibility Of System Status.

Users were unsure of when they were being spoken to by the narrator due to lack of visual signifiers.

Loading animations were not implemented making users unsure of what was happening during machine learning model load times.

Narrator

2 mins

Gestures.

Bounding Box.

Activity - Arm Movement

Instructions.

Keep your hands inside the purple box as it moves into your torso area ('Bounding box') and outside, into an open pose.

Your camera will be used.

You will be required to stand.

Start.

To be, or not to be...

- Large Audience
- Small Audience
- Regular Audience
- Quiet Audience

User Control & Freedom.

There were no exit buttons during activities, meaning users could not leave the activity without closing the whole application.

Stages initially autoplay without the user needing to prompt it. This made users feel rushed. ‘Start‘ and ‘Continue‘ buttons were added to amend this.

Error Prevention.

Users were not reminded to act naturally, so therefore over time were observed to change the manner in which they were interacting with the activity to be less natural but more efficient at completing the activity.

To avoid users doing the wrong action progress bars and counters were added to each activity to show progression towards a goal. This was visual feedback to notify users of correct interactions.

To be, or not to be...

- Large Audience
- Small Audience
- Regular Conversation
- Quiet Conversation

To be, or not to be...

- Large Audience
- Small Audience
- Regular Audience
- Quiet Audience

Ball Control.

The understandability of the “Ball Control” activity was enhanced through a key modification: the background colour can shift from red to green when the user’s vocal level reaches the desired level. This visual cue provides immediate and intuitive feedback, simplifying the user experience and aiding in the mastery of vocal control.

Additionally, this alteration serves a dual purpose by allowing users to maintain their focus on the script displayed prominently at the top of the screen, which has been enlarged for better readability. By minimising the need to shift their gaze towards the ball’s height at the bottom of the screen, this design improvement reduces the likelihood of user error.

Narrator

<10 mins

Gestures.

Arm Movement.

Session - 4 Activities

The four 'Arm Movement' activities will focus on moving your arms to draw attention from your audience, and look comfortable on stage.

Activities use the camera.

Standing position required.

Start.

Introduction Pages.

From previous versions, the explanatory introduction pages were redesigned.

A toggle for the narrator was included for users who do not want to have their audio playing at volume during their activity.

Signifiers that the user's camera will be accessed by the activity were added. This is also seen with a microphone for vocality activites.

The position the user will be required to be in is also included under the text description, alongside the camera permission signifier.

Demonstration examples in the form of video loops will be played in the centre of the screen, above the text description, as a visual aid for users attempting an activity for the first time. This was carried through and improved from previous versions.

Instructions.
Stand back about 2 metres from device so that your face is within the frame above.

Stand Back.

Instructions.
Stand back about 2 metres from device so that your face is within the frame above.

Move Closer.

Perfect!

Framing.

To accommodate the varying spatial requirements of the application, where users need to alternate between standing away from the device and being nearby, a framing overlay has been developed. This feature is designed to guide users in positioning themselves correctly relative to the device.

The overlay provides dynamic feedback, instructing users to move further away or closer as necessary. This is observed in activities that require a full-body view. When the user reaches the suitable threshold distance, the overlay confirms their correct positioning through a combination of text and visual cues. This illustrative feedback ensures that users are always aware of their positioning relative to the device's camera.

Trigger.

Current state of the screen.

Activity explanatory video starts playing after user selects to play an activity for the first time.

Questionnaire question prompting the user to pick an option to continue.

Affordance.

User.

User watches and listens to video. They are afforded the ability to skip or mute the video, and to exit entirely.

User reads the question and taps the answer they believe is correct. This calls on their recollection of the previously watched video and decision making skills.

Device.

What the device affords the user*

Audio will be playing from the device and a video being played. The device will be close to the user so they can hear. Physical interaction (tap) is possible but not required.

The device will be either in the users hand or on a surface close by to the user, as it requires a physical tap.

Feedback.

User will be tested on the video with a questionnaire for certain activities (currently bounding box and exclamations.)

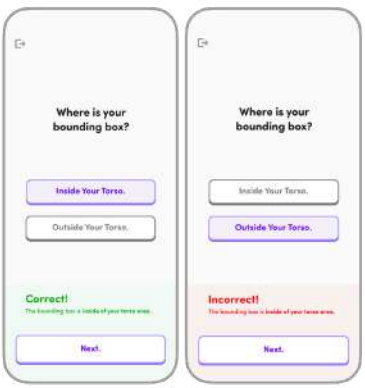
Exiting wil result in going back to the activities journey.

Skipping will bring the user to the questionnaire or the activity.

Muting will result in a state change of the audio button in the top right corner of the explanatory video page.

The user selecting an answer will result in the opposite button changing to grey, and the "Submit." button activating and turning purple.

After pressing "Submit." an overlay informing the user if they are correct or incorrect is displayed.



The screen displays the user's camera and prompts the user using text and illustration to stand back.

User reads the instructions on screen. User stands up and back, away from the device, as to be in the frame.

Reading · Propping up device · Visual Feedback

Device is placed on a surface facing the user. Camera is accessed to record video.
Audio prompts user to stand back from device.

Camera · Listening · Away From User

The user is able to see their position using the camera, so they can manoeuvre accordingly.

The framing overlay on the device will change when the user is in the correct position. The text will say "Perfect!" and the visual will change to have a tick.

Screen displays an arm movement activity which gives visual and audio instruction.

User reads the instructions on screen. User is stood up and moves their arms as they are instructed. User listens to audio description and instruction.

Movement · Visual Feedback

Device is placed on a surface facing the user. Camera is detecting hand locations. Audio description and instruction is being played.

Gesture Detection · Away From User · Camera · Listening

If the users's hands are in the correct place, the colour of the ellipse surrounding the hands change. The progress bar will also extend to the right of the screen.

When the user has had their hands in the correct position for the right amount of time the activity will end.

Screen displays a vocality exercise which prompts user to speak at the indicated level by instructing the using text to speak out load.

User reads the script on screen and watches their vocal projection level.

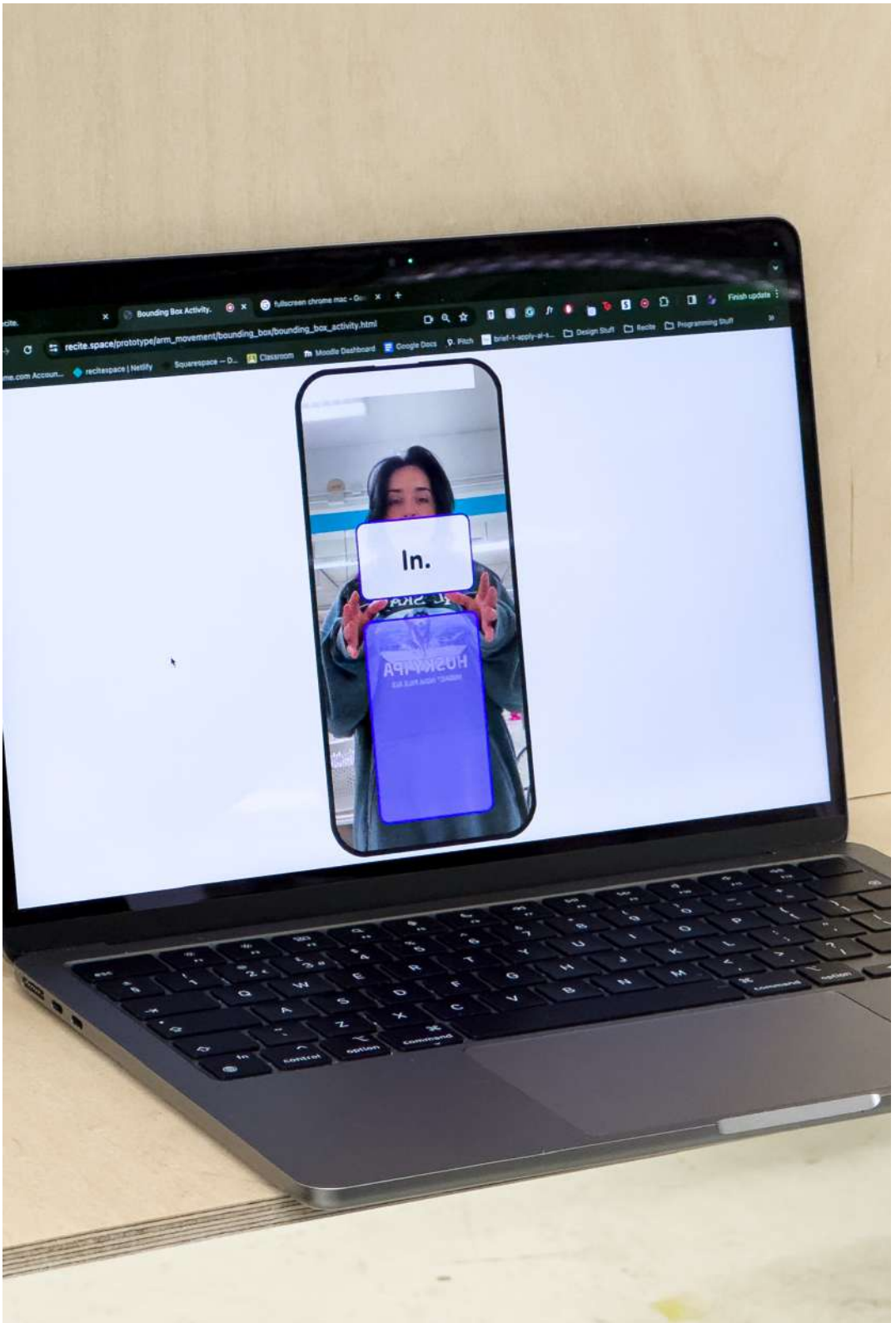
Visual Feedback · Reading · Speaking

Activity background colour changes depending on user vocal projection performance.
Device is closer to user.
Device (ideally) is in a quiet environment.

Holding · Placing Down · Audio

If the user speaks at the correct level, the background colour goes green, when it is not at the right level it goes red.

The sphere moving up and down indicated to the user the level at which they are speaking.



*User playing through ‘Bounding Box‘ activity. In shot is their arms moving into the bounding box.

Bounding Box

"Bounding Box", the initial activity in the arm movement session, is designed to encourage users to extend their hands beyond the confines of their torso area, promoting greater range and expressiveness in arm movements.

The activity sequence begins with an explanatory introduction that includes a video demonstration and a concise text description of the expected movements. This setup helps users understand the objectives and mechanics of the exercise before starting.

Upon initiating the activity, the framing overlay assists users in positioning themselves correctly relative to the device.

In this activity, the colour scheme has been carefully chosen to include purple and orange: purple to indicate correct movements, and orange to serve as a warning or prompt for adjustment. This colour coding maintains visual consistency with the overall design of the application.

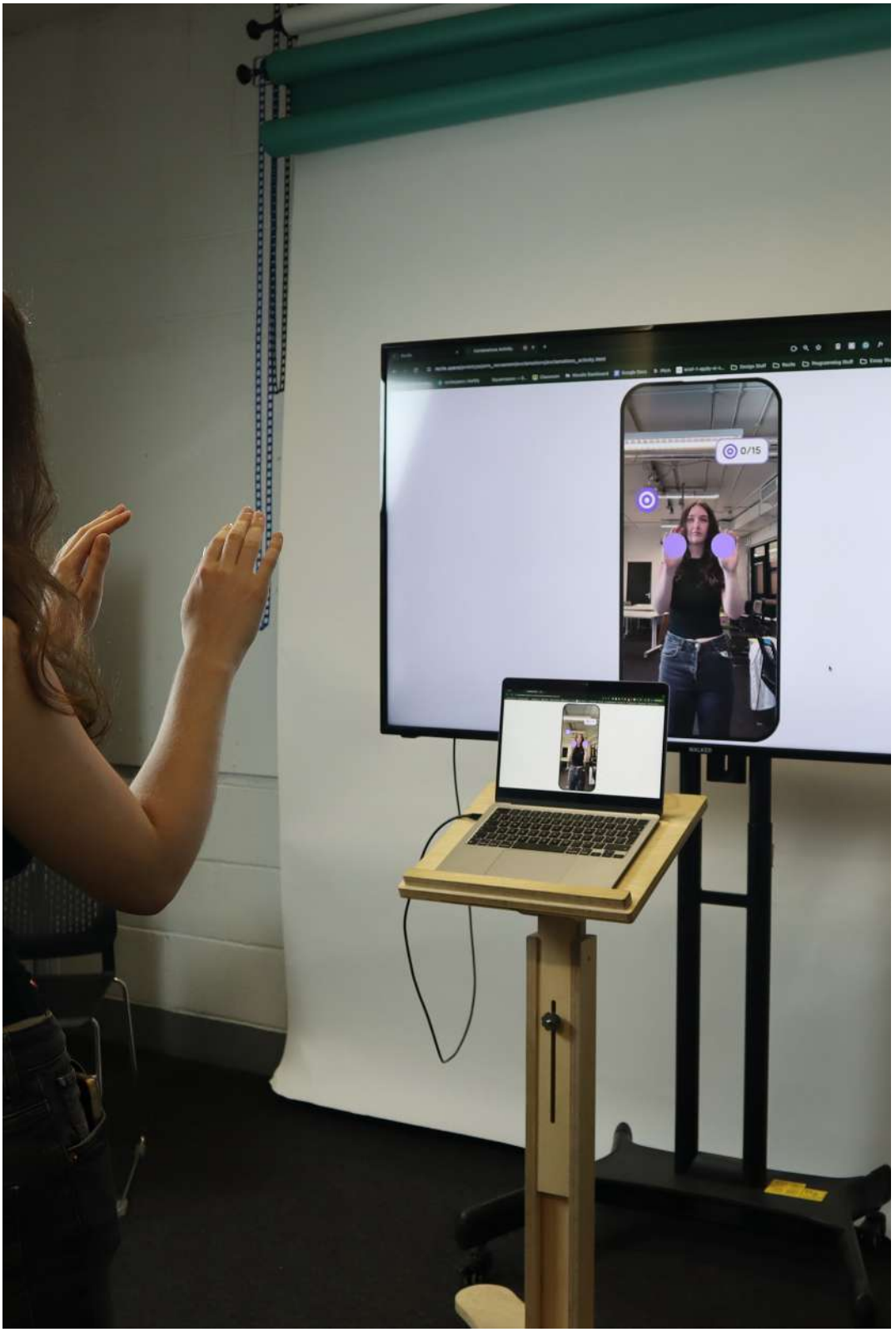
The instructions during the activity are presented in large, bold text to ensure that they are easily readable from a distance, catering to users with visual impairments

Fluid Arm Movement.

Following the “Bounding Box” activity in the arm movement session, the “Fluid Arm Movement” activity encourages users to extend their movements outside their bounding box in a controlled and natural manner.

Designed to be completed more swiftly than other activities, “Fluid Arm Movement” serves as a grounding exercise. Its purpose is to reinforce the importance of appearing natural and composed, rather than hastily moving through the motions. During the activity, users are encouraged to reflect on their movements, considering how they might appear to an audience, thus fostering a more thoughtful and deliberate approach to public speaking.

In this iteration, the visual elements, such as the ellipses tracking hand movements, have been designed. These ellipses continue to employ a purple colour palette, mirroring the “Bounding Box” activity for visual consistency. When users achieve correct timing and positioning, the ellipses darken in colour. This immediate visual feedback helps users adjust their actions in real-time.



*User playing through ‘Exclamations!‘ activity.

Exclamations!

The “Exclamations” activity, positioned as the third exercise in the arm movement session, directs users to extend their arms in a more exaggerated manner at appropriate moments during speech. This activity helps participants understand the power of using dynamic gestures to emphasise key points, enhancing the overall impact of their presentations.

Similar to the “Bounding Box” activity, “Exclamations” incorporates a questionnaire following an explanatory video. This method is employed to reinforce learning and assess users’ comprehension of how and when to effectively use exaggerated movements, or exclamations, to punctuate their speech.

The UI for this activity closely mirrors that of the “Fluid Arm Movement” exercise for consistency, with a significant addition: targets appear above the user’s hands. Participants are prompted to extend their hands to these targets to perform an exclamation. Each successful hit is acknowledged with an audible ‘ding’ sound, and the user’s score increases, providing instant feedback and a sense of progression.


ONETHIRTY

Compound Movement.

"Compound Movement" stands out from its preceding activities in the arm movement session by requiring users to follow along with a narrated speech without visual instructions on specific gestures. Instead, participants must rely on auditory cues and apply the arm movements they have learned from previous exercises. This method tests the user's ability to integrate and execute these movements spontaneously during a speech, reflecting real-world public speaking scenarios.

The rationale behind this activity is to encourage users to synthesise all the information and techniques acquired from earlier sessions. The activity tracks specific movements such as exclamation and transitions in and out of the bounding box, ensuring users apply these techniques appropriately.

To maintain clarity and prevent confusion, visual cues indicating the boundaries of the bounding box and the target areas for exclamations are provided.

“This is fun.”

Activity Flow.

In the fourth prototype, each activity within the activity journey is integrated into a broader session designed to enhance public speaking confidence. These sessions include multiple activities accompanied by supplementary materials that collectively aim to improve users' skills.

The task flow, detailed on the following page, exemplifies this structure using the "Bounding Box" activity, the initial exercise in the Arm Movement session. The sequence for this activity is methodically laid out: it begins with an explanatory video that introduces the key concepts and movements. This is followed by a questionnaire to reinforce the information observed by the user, ensuring comprehension and retention. The activity itself then commences, and it concludes with a summary or feedback segment to solidify the learning experience. This format is consistent across all four activities within the Arm Movement session.

Arm Movement.

Activity 1.
Task Flow.

Screens.

User.

User taps the bounding box text or the circle to start the activity.

User is intended to watch & listen to the video animation.
They have the option to mute or skip the video.

System.

Fade in animation when this screen is entered. The 'Bounding Box' label has a hovering effect over the circle.

System plays the animation and audio.
A transcription of the audio is played above the animation.

Code.

Screens.

User.

User watches tutorial animation and reads instructions to understand activity. When they are ready they press "Start."

User sees that they are standing too close from the camera frame and illustration.
User steps back.

User sees that they are standing too far from the camera frame and illustration.
User steps forward.

User sees that they are standing the correct distance from the camera frame and illustration.
User stands stationary.

System.

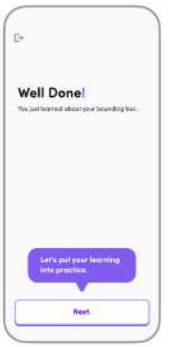
System is playing animation.
Narrator toggle is saved to localStorage.
"Start." is pressed, next page called.

Device camera is started.
When user's face is within threshold distance from device, the next overlay is called.

Device camera is started.
When user's face is within threshold distance from device, the next overlay is called.

System plays animation to signify correct distance from device.
Activity page is called.
Hand detection background loaded.

Code.



s to recall the information
the video animation.
must read the question and
an answer to the question.

User thinks of their answer and taps on the button they think it is.
User presses submit to confirm their answer.

User will see if they are correct or incorrect.
They will press next to continue to the next question or finish.

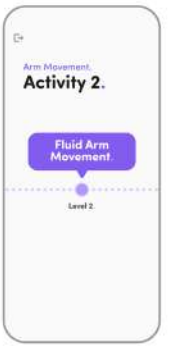
User will see that they have completed a part of the activity, and feel motivated by CTA to press "Next."

m loads the question and
er page.

When submit is tapped a conditional statement determines if user is correct, then changes the screen overlay accordingly.

The amount of user correct and wrong answers will be stored in LocalStorage. This can be accessed later.

LocalStorage is access to determine the subtext content under "Well Done!" depending on the amount of correct answers.



ees that they are prompted
ve their hands outside of the
ding box.
moves their hands.

User sees that they are prompted to move their hands inside of the bounding box.
User moves their hands.

User sees they have completed activity. They are prompted to come closer to device. User reads the tip and taps "Finish."

User feels sense of accomplishment.
They see the animation moving them to the next activity.

User sees the title of the next activity they can try.
User decides if they want to begin or exit by pressing the exit icon.

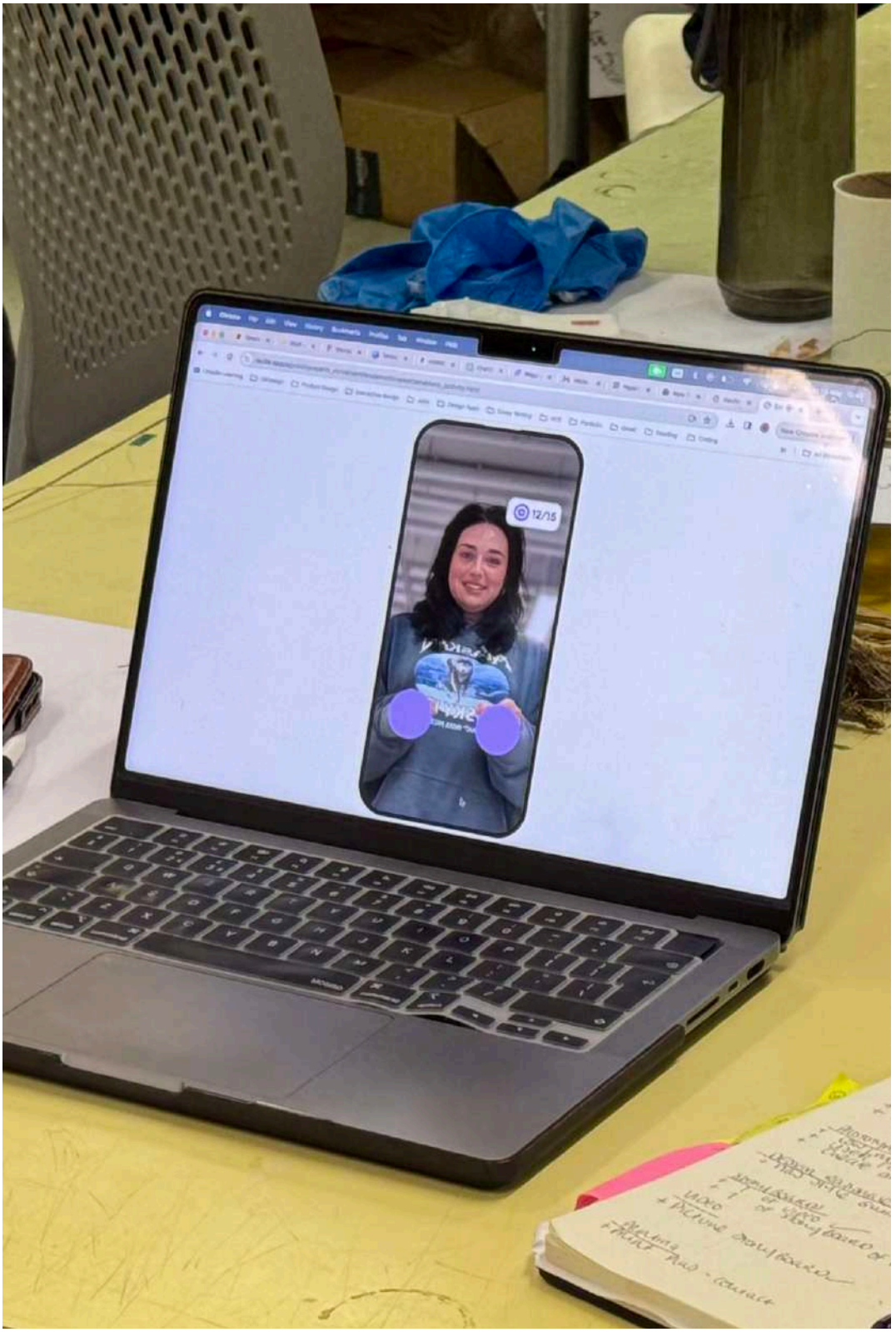
tor audio playing.
detection is started.
ontent is displaying "Out", after
nds a state change is called.

Narrator audio playing.
Box content is displaying "In", after 2 seconds a state change is called.
Time In & Out box is counted.

This screen is called when counter hits 15 seconds for both actions.
Congratulatory audio is played.

LocalStorage logs completion of activity.
Move to next activity animation is triggered.

Changed to new state. System opens to this state on reload.



*User playing through ‘Fluid Arm Movement” activity.

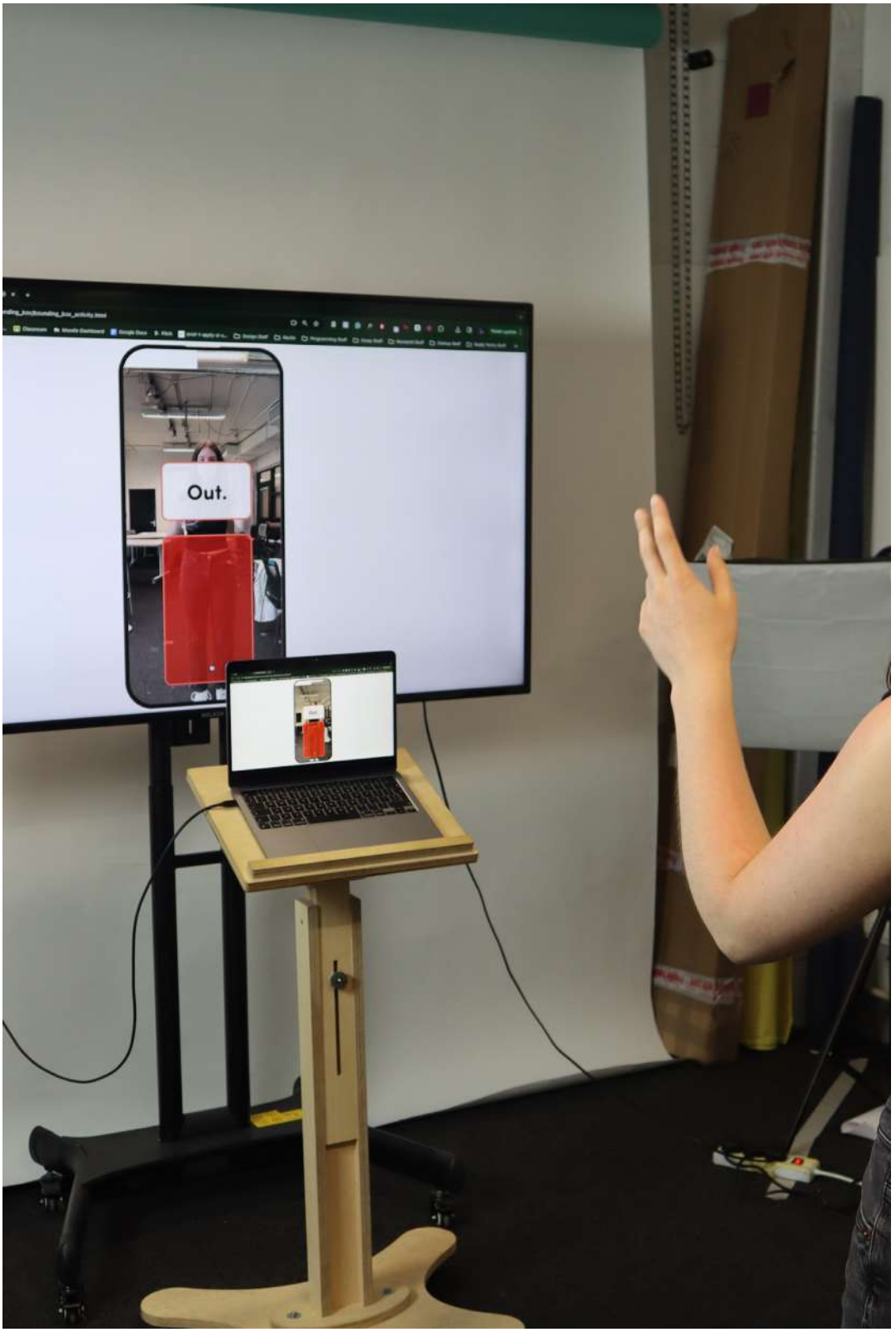
Design Evaluation.

The final evaluation of Recite that concluded with the fourth interactive prototype consisted of four user tests.

The results of these tests demonstrated notable improvements in usability; participants clearly understood the interactions required and the objectives of each activity. This indicates that the application's design effectively communicated its functionalities and goals.

Negetive results from the testing were errors in the code making some audio files not play, leaving the user in a state of confusion.

Users decribed the activities as fun, and were insistent to try other activities and move onto the next one. They can be observed in video recordings to be smiling and having frustrated facial expressions when not scoring or moving the progress bar, validating that Recite has an immersive element or experience.



*User playing through ‘Bounding Box” activity, showing an instance of hand tracking.

Code Evaluation.

The code for the fourth interactive prototype of Recite has proven to be functionally robust, enhancing user awareness of the system status and providing free navigation across most sections of the application.

However, load times have become noticeably slower compared to previous prototypes, primarily due to the extensive use of video media embedded directly within the code files. To address this issue, optimising the media files through compression or hosting them externally could significantly reduce load times, thereby enhancing the application's performance and user satisfaction.

From an accessibility standpoint, alterations have been made by incorporating ARIA labels into anchor tags and sections, and by adding alt text to images. These enhancements have effectively addressed several prominent WCAG (Web Content Accessibility Guidelines) issues, making the application more accessible. Despite these improvements, there are still several less obvious accessibility errors that require attention to ensure broader compliance and usability.

Regarding the technical implementation, MediaPipe hand-tracking has been a non-issue. However, challenges with the HTML canvas element, particularly flickering issues when redrawing the ellipses from arm movement activities. This flickering can detract from the user experience. Rendering methods, in future, should be redefined.

“If it scares you it may be a good thing to try.”

-Seth Goodin.

Conclusion.


From Stage Fight
To Spotlight.

Reflection.

Throughout the design and development of the Recite project, I gained substantial insights into how I work as a designer as well as enhanced my skills in interaction design. The complexity of interactions required by users, from placing their phones down to stand up, to transitioning between using body language and voice, challenged me to align the application's design closely with users' mental models. It was crucial to ensure that the technology used in the prototypes did not leave users feeling confused or in limbo.

Moreover, the impact of public speaking on individuals became profoundly evident during the project. Every participant from the young, developing professional demographic shared experiences that highlighted their struggles with public speaking, with none conveying neutral or positive anecdotes. This universal challenge underscored the significant need for an application like Recite, which aims to transform public speaking from a daunting task into a skill that can be developed and mastered through structured, supportive practice.

What Next?

Accessibility considerations, as mentioned earlier, were not prioritised in the previous versions. Designing for the inclusion of the less abled would impact Recite's usability for the better and should not be overlooked.

Long-term testing such as an unmoderated usability study and providing Recite to its user base for a period of weeks to measure their public speaking confidence improvement in comparison to a control would be beneficial for justifying the application's external validity.

Creating more activities for a full journey to improve users' public speaking ability would ensure Recite could go to market and be commercially feasible as a product.

To view the Recite prototype you are visit:

www.recite.space

or you can scan the QR code below.

Thank you for reading, and I hope you learned something.

The design decisions behind Recite, the public speaking self-confidence improvement mobile application.

A project conducted by Thomas Kelly.