

BREATH HARMONY

How might we utilise **mindfulness techniques** and **XR** to quickly **alleviate** mental distress immersively, such as stress and anxiety, for young adults?



TABLE OF CONTENTS

O1	ABSTRACT	16	IDEATION PHASE
O2	THE CHALLENGE	31	IMPLEMENTATION PHASE
O3	BACKGROUND + CONTEXT	36	FINAL OUTPUT
O5	PROBLEM STATEMENT	40	EMERGING TECHNOLOGY STREAM REQUIREMENTS
O6	METHODOLOGY	43	REFERENCES
O8	INSPIRATION PHASE	46	ACADEMIC HONESTY DECLARATION AND DISCLAIMER

ABSTRACT

This visual summary will look into the integration of extended realities and ideas of mindfulness to create immersive environments to help mitigate mental health issues among young adults who have the highest rate of mental health issues in their day-to-day lives, providing effective coping mechanisms for young adults.

In our current world, there have been many emerging technologies coming out with the potential to help solve this problem, creating an accessible, engaging and effective way to help mitigate mental health issues, such as stress and anxiety. An area that hasn't been heavily touched upon or developed due to the newer nature of these technologies.

To address this issue, an immersive AR prototype will be created following the IDEO human-centred design toolkit in terms of its methods and processes, focusing on the users and the humans affected by this issue. We will evaluate the research within the last phase of implementation to ensure that this research is effective, viable and feasible.

Results indicate that users were able to learn more about breathing techniques and mindfulness using a more immersive and exciting method. They created a moment for themselves to calm down when they needed it in the most critical situations. This research provides insights into using AR and mindfulness together for future research.

Keywords: Mental well-being, Extended Reality, Mindfulness, Design research

THE CHALLENGE

Students within the Emerging Technologies stream are to be looking into utilising emerging technologies to help address or aid in mental health issues. Looking into designing and exploring products, environments, services and experiences. These final projects are being produced using emerging technologies such as XR, VR, UI/UX, IoT, gamification, and AI. The stream is partnering with the Empathic Computing Laboratory (ECL) to create innovative, impactful solutions and aids, utilising emerging technology to enhance the final project and evaluating the usage of the chosen technologies. The following report follows how I tackled this challenge.

PARTNER: EMPATHIC COMPUTING INSTITUTE

I will be partnered up with the Empathic Computing Institute, an academic research laboratory whose main research themes are looking into empathic computing, collaborative interfaces, augmented reality and virtual reality. They look into the mainstream of empathic computing and both the software and hardware components to allow for more empathic technology, along with the research about the interfaces for the usability of these technologies (Empathic Computing Lab, n.d.).

Figure 1.
Empathic computing institute



Note. Copyright 2024 by Empathic computing institute

BACKGROUND + CONTEXT

Figure 2.

Data infographic of mental distress in adults

1 IN 5

Adults experience medium to high levels of mental distress



Note. Graphic made by author, data from New Zealand Mental Health Monitor (New Zealand Mental Health Monitor, 2018)

MENTAL HEALTH DISTRESS IN YOUNG ADULTS

- 1 in 5 adults experience medium to high levels of mental distress, mainly 15-24 year olds (New Zealand Mental Health Monitor Survey, 2018)
- A steady increase in the proportion of New Zealanders who have high levels of mental distress over time, with the highest age range being from 15 to 24 years old (Ministry of Health NZ, 2019)
- Not just within NZ, it's a global issue as within the UK, it is seen that 74% of people felt so stressed they had been overwhelmed or unable to cope; within the 74%, 61% of them reported feeling anxious (Mental Health Foundation, 2018)

LACK OF PROBLEM-BASED COPING STRATEGIES

- Young adults are more likely to have avoidance-based coping strategies than problem-focused ones. (Konaszewski et al., 2023)

LOOKING INTO COMBINING THESE TWO POINTS TO HELP YOUNG ADULTS USE PROBLEM-BASED STRATEGIES LIKE MINDFULNESS.

'BACKGROUND + CONTEXT

POSITIONALITY STATEMENT

I'm Emily Chin, a 21-year-old of Chinese descent who was born and raised in Auckland. Currently studying in a Conjoint Bachelor of Design and Science, majoring in Computer Science. I'm in my third year of study, working a retail part-time job.

Due to my position, I have a lot of privileges and opportunities to access materials and tools as a student at a university. I have some privilege from where I grew up and from my parents as a child. As a student studying computer science, I am able to gain more knowledge on certain emerging technologies and more resources. Because of this, I do have access to resources needed for this resource, as well as previous experiences and skills with technologies I will look into.

Figure 3.
Positionality Wheel with notes based on my positionality



Note. Positionality Wheel with my own notes of my positionality. The original image is edited by the author. Original image taken from Noel (2020) <https://lesleyannnoel.wixsite.com/website>.

■

PROBLEM STATEMENT

**HOW MIGHT WE UTILISE MINDFULNESS
TECHNIQUES AND XR TO QUICKLY
ALLEVIATE MENTAL DISTRESS
IMMERSIVELY, SUCH AS STRESS AND
ANXIETY, FOR YOUNG ADULTS?**

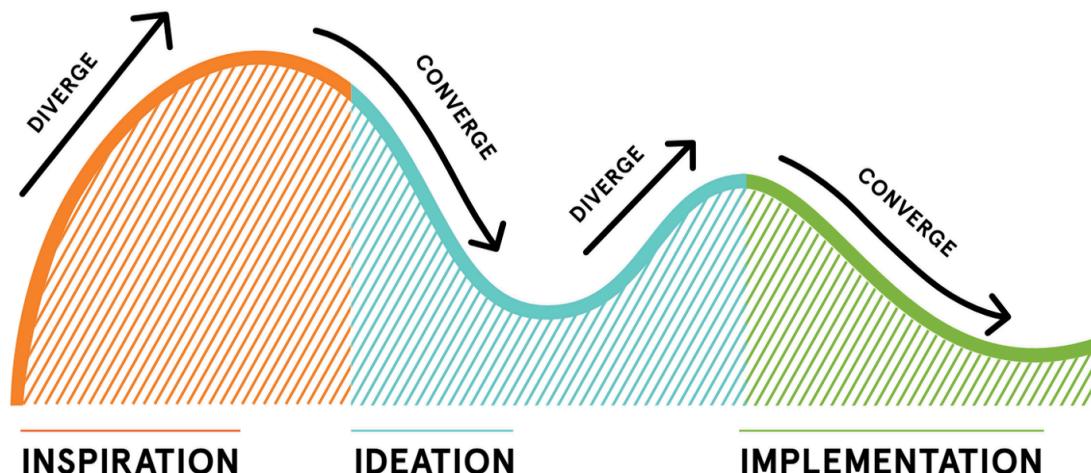
METHODOLOGY

IDEO HUMAN-CENTRED DESIGN TOOLKIT

For this project, I was looking into the IDEO design kit, "The Field Guide to Human-Centred Design". The IDEO design kit also ensures that users are within the design process itself, as one of IDEO's main points was looking into how central stakeholders are the key to finding a solution. (Ideo.Org, 2015). The IDEO design kit also looks into innovation and creating a real impact by ensuring its design is desirable, viable and feasible. This will allow the research to be truly impactful and sustainable.

This methodology is split into three phases: inspiration, ideation, and implementation.

Figure 4.
IDEO Human-centred design toolkit



Note. A graphic showcasing the IDEO Human-centred design methodology with each of the phases. Copyright 2015 by IDEO.org

INSPIRATION

In the inspiration phase, I will look into **understanding** the **context** of the challenge, using tools from the toolkit such as "Frame your project", "Create a project plan", "Interviews" and "Secondary research".

IDEATION

Within the ideation phase, I will look into **creating ideas** for my project. Using the tools from the toolkit of "Rapid prototyping", "Create a concept", "Storyboard", "Get feedback" and "Integrate feedback and iterate".

IMPLEMENTATION

In the last phase of implementation, I will look at the **feasibility** of the project and the **final results**. I will look towards using the tools of "Monitor and Evaluate" and "Keep iterating" from the toolkit.

PROPOSED TIMELINE

INSPIRATION

WK 1 - WK 5

- Frame your project
- Create a project plan
- Interviews
- Secondary research

IDEATION

WK 5 - WK 11

- Rapid prototyping
- Create a concept
- Storyboard
- Get feedback
- Integrate feedback and iterate

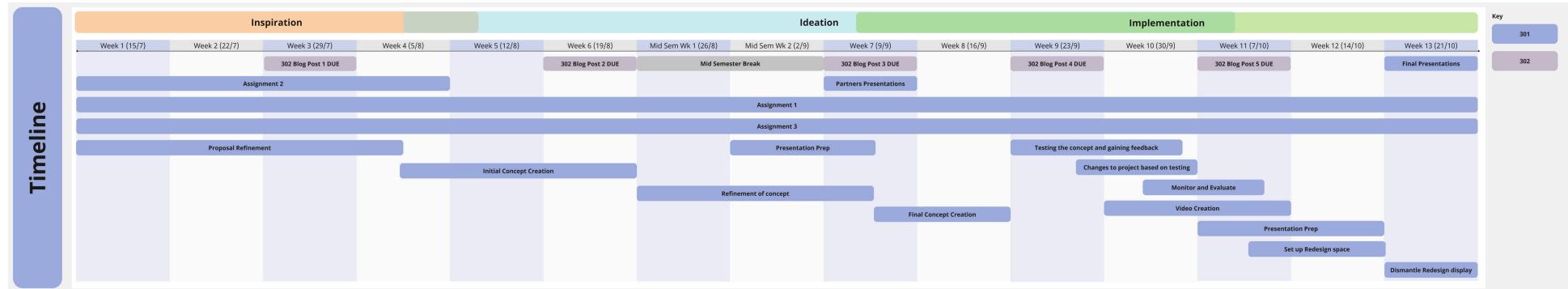
IMPLEMENTATION

WK 7 - WK 13

- Monitor and Evaluate
- Keep iterating

Figure 5.

Timeline made for the project following IDEO HCD methodology



Note. A screenshot from the authors Miro board showing a timeline made for the project, split up within sections following the IDEO HCD toolkit.

INSPIRATION PHASE

Within this phase, I look into **understanding people**, mainly ones who have dealt with mental illnesses, anxiety and stress. I learn more about them, their **problems**, their **lives** and their **needs**.

INSPIRATION PHASE

SECONDARY RESEARCH

I started off this phase by doing general background research on the topic and creating a literature review to ensure I understood the topic and the previous information surrounding my topic.

MINDFULNESS

Mindfulness is "the awareness that emerges through paying attention on purpose, in the present moment" to experience moment by moment nonjudgmentally (Marenus et al., 2021). Mindfulness interventions help influence psychological variables of anxiety and stress (Ngamkham et al., 2019). Being a method that has very few side effects (Zuo et al., 2023) yet is highly effective. There has been a significant relationship between mediating and its effects on personal well-being and resilience. A study looking into millennials showcased how a mindful individual with a high level of personal well-being would have low levels of psychological stress (Oh et al., 2022). Current market meditation-based applications showcase leaning more towards relaxation than actual meditation, with traditional meditation techniques using tools of boarding meditation balls or Tibetan wheels to show slow and continuous movements, creating a mindfulness state rather than current applications having more static imagery (Roquet & Sas, 2018).

AR (AUGMENTED REALITY)

Pazer (2024) thought about how combining both VR and AR would create an effective system that would be more accessible than purely VR itself, as augmented reality can be accessed within smartphones and tablets. It was also mentioned that it can help reduce the physical side effects of VR sickness. Despite the amount of information about VR and mental health, there is a lack of AR, and it is only considered when mixing it with VR, but not by itself.

INSPIRATION PHASE

SECONDARY RESEARCH

Then, continuing on with secondary research, I looked into doing **precedent research** and looking at previous products, experiences and applications that were similar in nature to what I'm doing. These precedent works become case studies for myself that I reflect on and gain insights from.

MINDFULNESS AND MENTAL HEALTH RELATED APPS



Headspace

An accessible application that uses evidence-based meditation and mindfulness tools to help improve the user's mental health (Headspace Inc., 2024). They cover a range of exercises, including meditations, sleepcasts, mindful movement, and focus exercises. Providing guiding experiences with audio and video to help the individual. This is a successful case study looking into accessible mindfulness.

Insights Gained



Oak

Oak is another accessible application for mindfulness, looking more into breathing techniques and quick mindfulness sessions, shorter than Headspace. It has a more simple UI and application, making it a convenient app. The main idea behind Oak is to teach users the fundamentals of traditional meditation, allowing them to gain the knowledge of how to meditate alone, without the need of guided meditations. It utilises technology to help track your progress, looking into integrating with health apps and smart watches. It tracks data for the user, such as minutes meditated and the number of breaths taken.

Insights Gained



Calm

A mental health app to help manage stress, sleep and live a better life. It looks specifically into sleep, stress and anxiety and mindfulness. It covers many different aspects, looking into helping relieve stress and anxiety. Sleep related aspects in making sure the user can sleep better and longer. It introduces the idea of a 60 second breathe bubble to help when the user is overwhelmed and to go back to a better state of relaxation. Soundscapes are also used, depending on the colour of the noise, it helps in different aspects, such as brown noise for relaxation and sleep.

Insights Gained



INSPIRATION PHASE

PRECEDENT RESEARCH - EMERGING TECHNOLOGIES



recoVRy
Experience - Changing Minds
recoVRy is Changing Minds visually through VR. It aims to raise awareness and understanding of mental health issues by allowing users to see things from the perspective of someone experiencing mental illness.

recoVRy

recoVRy uses VR to create simple and safe experiences to understand those who have recovered from severe mental health and addiction problems. "Mockingbird" is a short, interactive film with stories from real people going through their challenges, creating awareness and the experience of those placed within mental health facilities (Minds, 2022). This output addresses and creates awareness, using empathy by showcasing real stories instead of being something that helps to "cure" a specific mental health issue. It uses 360° video cameras to record the film and is presented within VR or an interactive 360° video.



TRIPP
Mood on Demand
Eyes open. Mind Open. World open. Experience a world of awe and wonder with TRIPP.

TRIPP

A digital wellness app that looks into a deeper connection to the self and collective well-being. It uses VR to help create immersive worlds, allowing users to go through mindfulness (TRIPP, 2024). It has many set types, such as daily focus and calm meditations, guided breathing exercises, sleep experiences, and custom and personalised experiences. It comes with a mobile app to help track progress. The use of VR, when integrated with the idea of mindfulness, is beneficial, as it can help increase the state of mindfulness with the help of both the use of the virtual environment and voiceover (Seabrook et al., 2020), which TRIPP showcases having within their product.

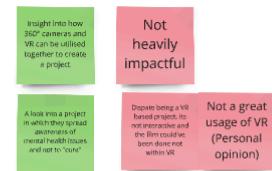


VR Experience | Soulvana
BuildDate : Updated 05.10.2024 @ 19:50 GMT+12:05

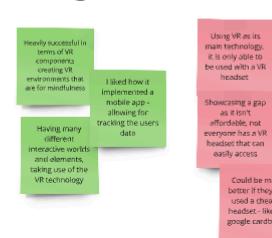
Soulvana

A VR experience in which the users learns about themselves. Its a VR experience that also is a game, using gamification techniques. It works to discover more about the user, personality, emotions and purpose, working to help aid users with depression. Working to spread love and work with philosophy of compassion, happiness, sadness and openness.

Insights Gained



Insights Gained



Insights Gained

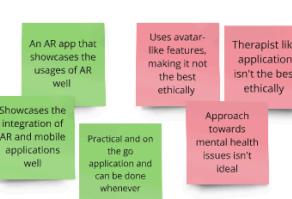


New UAlberta-developed augmented reality app helps Canadians manage mental health during COVID-19
The AR app features a variety of interactive elements, including a mood meter, a stress gauge, and a relaxation exercise. It also includes a buddy system where users can connect with others who are using the app to support each other's mental health goals.

YOU-AR-OK

University of Alberta researchers created an augmented reality app that helps users reflect on their day. Specifically made during the time of COVID-19, when isolation and limited social interaction made it so that people's mental health was lower (Anderson, 2020). It looks into using a buddy system that helps guide the user with questions while being placed within their space with augmented reality, creating a sense of familiarity.

Insights Gained



oVRcome

This is a VR based program in which it utilises exposure therapy (ET) and Virtual Reality exposure therapy (VRET). A program that looks into solving users phobias or anxiety with VRET. They have a selection of VR simulations in which users can pick and choose from to help cure their mental issues. They also have a focused area on for children and for clinicians.



oVRcome | Virtual Reality Exposure Therapy App
Virtual Reality Exposure Therapy directly to your smartphone. With a single subscription, you can now overcome phobias, anxieties, and more... all in the privacy of your home!

Insights Gained



INSPIRATION PHASE

PRIMARY RESEARCH

I started on primary research, looking into doing **interviews** and **surveys** to gain more insights, mainly on young adults' thoughts and feelings about mindfulness and meditation and also looking into their relationship with their mental health and how it affects them.

On the right is a table of the results from these interviews.

Below is a brainstorming session of questions to ask and my reasoning behind why.

Brainstorm of Questions



Questions	Interviewee 1	Interviewee 2	Interviewee 3
How old are you?	20	21	22
Ranking from 1 to 10, how much mental distress do you actively feel?	4	7	3
How do you deal with stress in your everyday life?	Breathe and Not think	Eat, drink, sleep	I will try to address the issue causing the stress, if not I'll look for other matters to keep myself busy
When is it that you feel stressed the most? What makes you stressed?	Money and Future	multiple events or deadlines around the same time creating situations such as when a deadline is due the next day and I haven't started.	When I'm unsure of the outcome to a problem or when a problem is out of my control
How important is self care for you? How habitual are these for you?	Not priority	I think it is important but I tend to neglect it and be lazy and enter a bad cycle.	Fairly important, I tend to follow the same routine
What is your opinion on the ideas of mindfulness and meditation?	Beneficial for some	Pretty nice in theory, but I personally feel like it's a waste of time	They are practices where you can incorporate to your daily life to reduce stress
Have you ever utilised mindfulness within your everyday life and if so how did it go?	No	No	No
If you have how was it? Did you enjoy it? Did you consistently stick with it?	No	No	No
Have you heard of meditation applications before and what were your thoughts on it?	Yes, Good for sleep	Yes, I'll probably use it once and never use it again	I find it to be a good way to clear your thoughts however it might not be able to solve your mental house issue.
Have you ever used mobile applications with XR and if so what is your opinion on it?	Yes, Entertaining	Yes, it's fun, love me some pokémon go	Yes, it is a great way to visualise an idea (eg. product) in our real world settings.
Anything else you would like to say?	No	No	No

INSPIRATION PHASE

PERSONAS

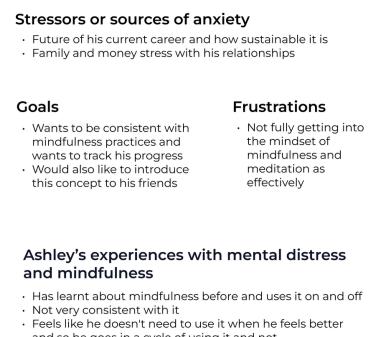
Based on the insights and information I had gained from both primary and secondary research, I looked into creating **personas** that I could use to focus on my project's target audience while I developed my design.

This helped to list the **needs** and **wants** of my target audience.



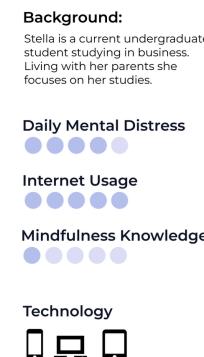
Clark

Age: 21
Gender: Male
Occupation: Courier driver
Location: Auckland



Stella

Age: 19
Gender: Female
Occupation: University student studying business
Location: Wellington



Ashley

Age: 26
Gender: Female
Occupation: Owner of a small local businesses
Location: Bali

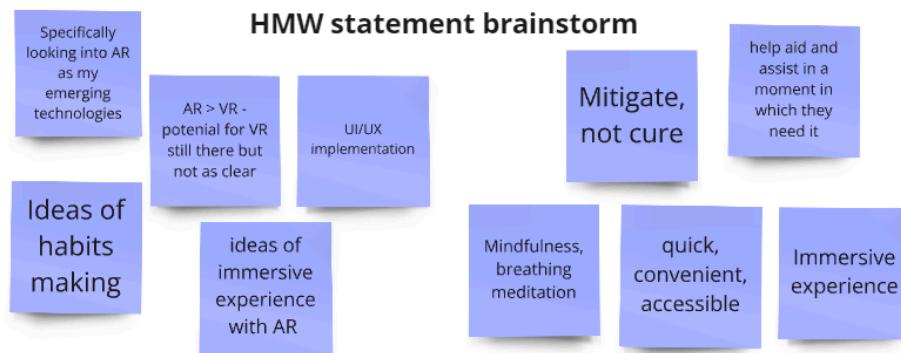


INSPIRATION PHASE

REFINEMENT OF HMW STATEMENT

Using the “**Frame your challenge**” tool from the IDEO toolkit, I looked into narrowing down my How might we statement. I am looking to refine and iterate my problem statement to be more specific.

On the right is the “**Frame your challenge**” exercise I did, following the questions given.



What is the problem you're trying to solve?

Aiding young adults with mental distress in a immersive manner

1) Take a stab at framing it as a design question

How might we use XR to help mitigate mental health issues such as anxiety and stress for young adults?

How might we help aid mental distress for young adults in an immersive manner?

2) Now, state the ultimate impact you're trying to have

Helping aid mental distress for young adults

More immersive and interesting manner

Promotion of Mindfulness techniques

Accessible and convenient help

3) What are some possible solutions to your problem?

More awareness

accessible and easy to use

interest in topic

4) Finally, write down some of the context and constraints that you're facing

Time, technology, interest

5) Does your original question need a tweak? Try it again

How might we utilise mindfulness techniques and XR to help quickly mitigate mental distress immersively alleviate mental distress for young adults?

How might we utilise mindfulness techniques and XR to quickly alleviate mental distress such as stress and anxiety for young adults?

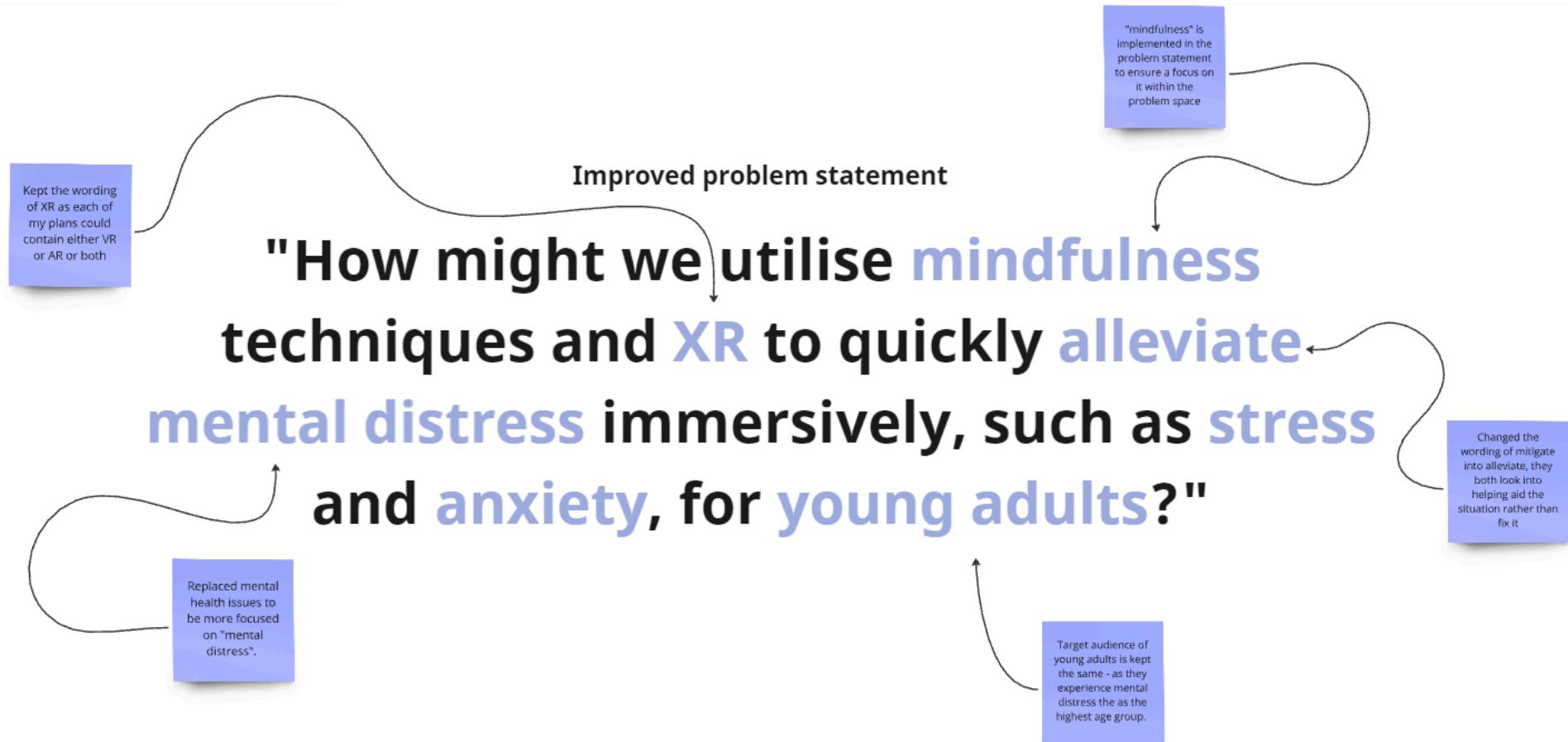
How might we utilise mindfulness techniques and XR to quickly alleviate mental distress such as stress and anxiety for young adults immersively?

How might we utilise mindfulness techniques and XR to quickly alleviate mental distress such as stress and anxiety for young adults immersively, such as stress and anxiety for young adults?

INSPIRATION PHASE

REFINEMENT OF HMW STATEMENT

From using the "Frame your challenge" tool from the IDEO toolkit, I had gotten the below as my problem statement.



IDEATION PHASE

Here, I'll combine what I have gathered within the previous stage and look into **generating ideas**, finding **improvement** areas to design, testing out my designs, and making them better fit as a **solution**.

IDEATION PHASE

MOOD BOARDS

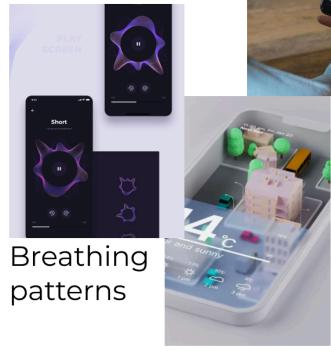
To start off the ideation phase, I looked into creating mood boards to help visualise what my project could be like.

This lead to both a hypothetical vision of the project below and also a branding mood board on the right.

HYPOTHETICAL VISION

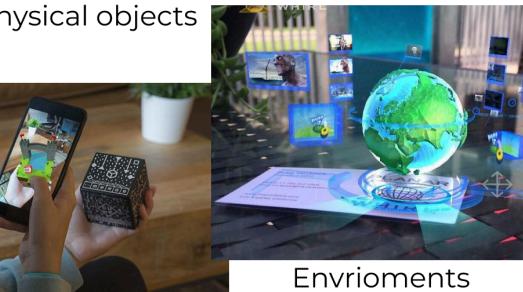


Potential UX/UI



Breathing patterns

Integration of phones, AR and physical objects



Envrioments

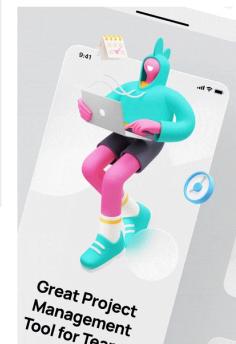


Hands and AR

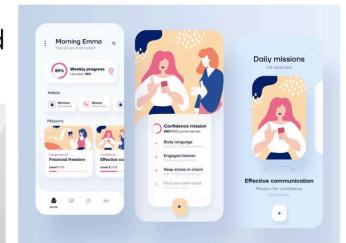
Clean and simple



Soft 3D



Round



BRANDING



Colour Palette

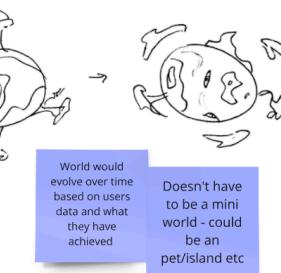
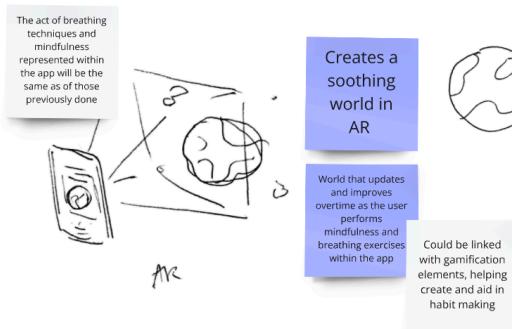
IDEATION PHASE

CREATING CONCEPTS

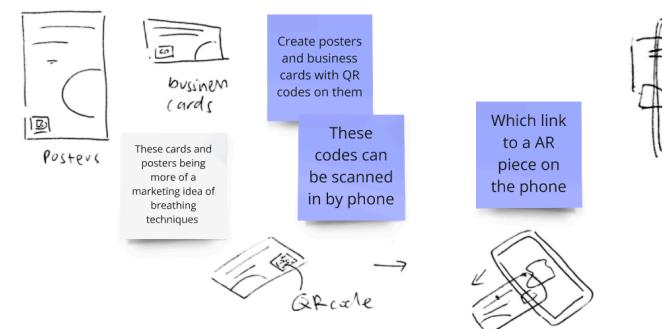
I then started on the ideation phase by looking into different ideas and concepts of a potential idea to help answer the problem statement.

Here are sketches and notes of three concepts which I then later gain feedback on.

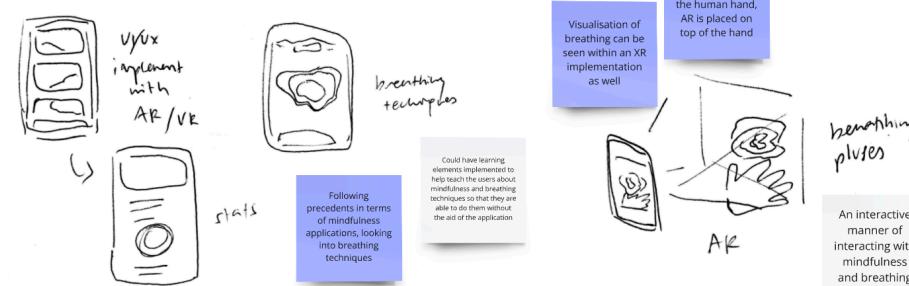
Concept 1



Concept 3



Concept 2



IDEATION PHASE

FEEDBACK ON CONCEPTS

Concept 1	Concept 2	Concept 3
<p>Seems to be very interesting to interact with, the gamification aspects makes it intriguing. Seems to be an app that is fun to use.</p>	<p>I like this concept, it seems simple and in line with your ideas from the previous plans.</p>	<p>Interesting method of interacting, making it more accessible and creating more awareness.</p>
<p>I wonder if there is an appeal between seeing this world being built within AR or within just the screen normally, how big of a difference would it be?</p>	<p>I find this to be the most interactive concept, with the idea of the AR playing with the hand making it more immersive</p>	<p>Could interact with the poster and cards themselves, adding on another layer of interactivity.</p>
<p>I find it fun, however the mindfulness and breathing don't seem to be the focus of the project.</p>	<p>This seems to have the most focus on breathing techniques which I enjoy.</p>	<p>Could be not a lone terms sort of thing, as many may not reach for a card or people may just walk past the street and not scan in the QR code</p>

FINAL CHOSEN CONCEPT

Based on the feedback given from the three concepts, **concept two** was then chosen to be further iterated. As concept two was the strongest idea that could be implemented and was feasible.

IDEATION PHASE

PLAN OF ACTION

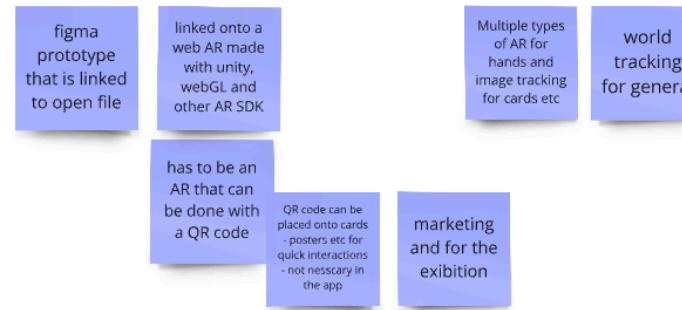
In order to tackle creating this prototype, I first looked into creating my prototypes using technology. I am looking into creating a **mobile application prototype** and then an **AR experience prototype**.

These two can be linked together if the AR is web-based, allowing it to be accessed within a Figma prototype.

STORYBOARDING

To fully understand my idea of my concept and its context of usage, I had created a quick sketch storyboard looking into how it would be used and in what context.

Plan of Action



From this I can rapid prototype with wireframes for UI and quick AR environments

Storyboarding



Scenario of a student who is getting stressed while they are studying - looks to go on their phone

Instead of avoidance based coping strategies such as scrolling through social media

Looks to use the application to perform mindfulness and breathing techniques to calm down

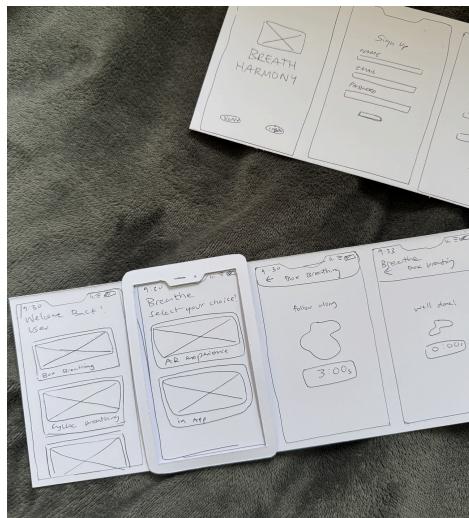
IDEATION PHASE

WIREFRAMING

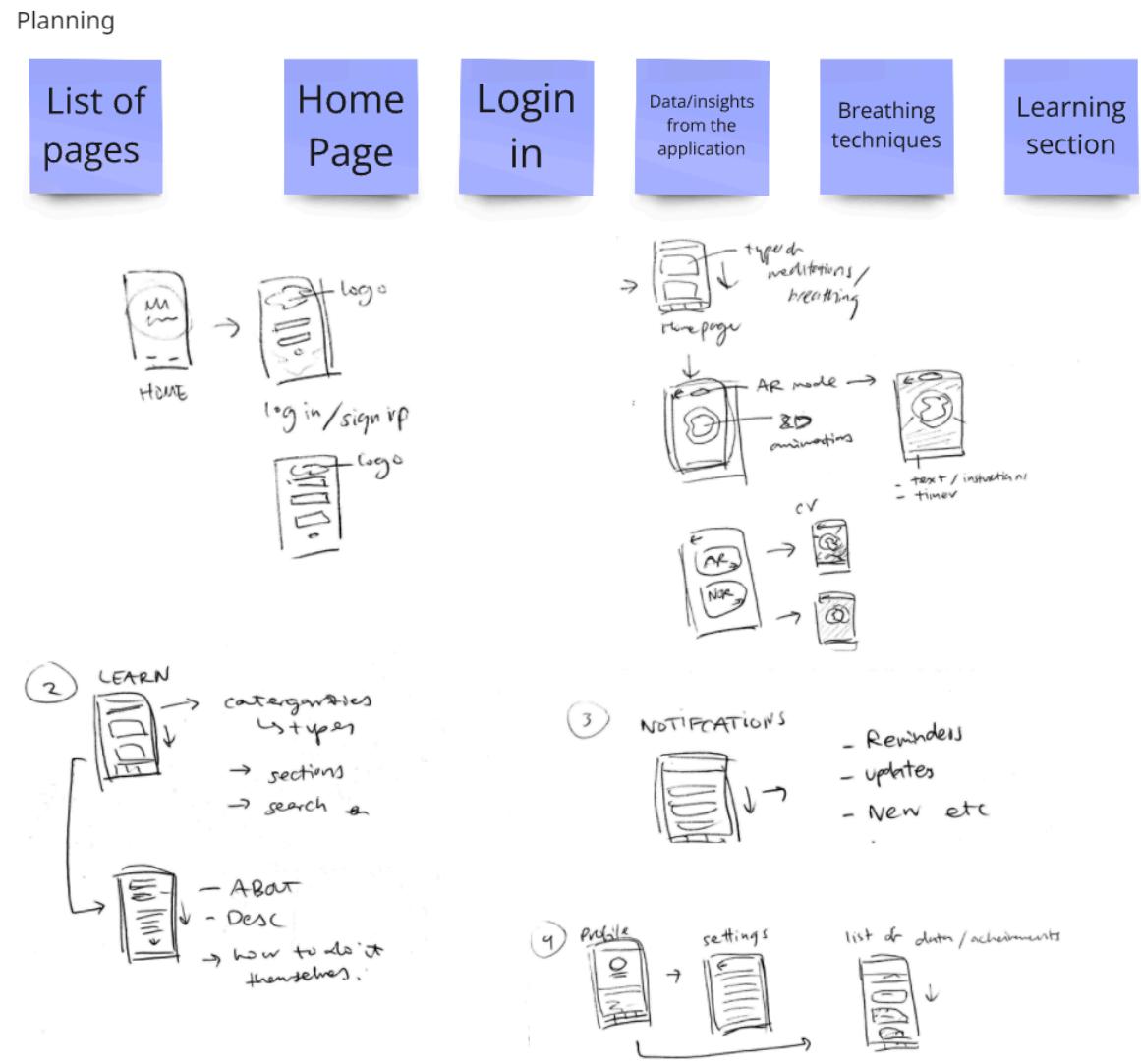
I started on the prototyping of the mobile application side of the project, listing out the pages I would need for the application and looking into sketching out and wireframing them.

I had also created paper prototypes following the wireframes to further test the prototype.

Figure 5.
Paper prototyping of mobile application



Note. A picture of a paper prototype for a mobile application.



IDEATION PHASE

FIRST FIGMA PROTOTYPE

Based on my wireframing process and allowing myself to understand further what I wanted to do for the mobile application, I looked into creating the wireframe in a Figma prototype, using the same technologies for the final output.

This can tested by scanning the QR code below.

Link to
the paper
prototype



The image displays a collection of Figma prototypes for a mobile application, arranged in a grid. The prototypes are categorized into several sections:

- Login:** Three screens showing the login process for the "Breath Harmony" app.
- Sign in:** Three screens showing the sign-in process, including entering a name and selecting goals like "Learn mindfulness" or "Learn breathing techniques".
- Home page:** Two screens. The first shows a "Welcome Back!" message with recommended breathing types: Box Breathing, Cyclic Breathing, and Favoured Breathing. The second screen shows a "Breathe" section where users can choose their experience (Normal Mode, All Mode) and set a timer (e.g., 1:15s, 1:10s, 1:05s, 1:00s).
- Learning section:** Two screens. The first shows a "Learn" section with "Cyclic Breathing" and "Box Breathing" options. The second screen provides a detailed explanation of Cyclic Breathing, mentioning its benefits and how it can help reduce stress and improve focus.
- Breathing exercise:** Four screens showing the breathing exercise interface. Each screen features a large circular graphic with a grey dot in the center, labeled with instructions like "Slowly breathe in" and "Slowly breathe out".
- Notification section:** Two screens. The first shows a list of notifications with placeholder text. The second screen shows a "Profile" section with a placeholder profile picture and a "settings" section with various configuration options.

IDEATION PHASE

FEEDBACK ON MOBILE APPLICATION

I then gained feedback following the wireframes and first prototypes, using this feedback to iterate back on my prototypes and plan out my future changes.

Feedback

Found the paper prototype to work well, pages link up in correct manners

Some inconsistent with the back arrow

Good work! Would love to see how this would look with its branding in place

Would love to know how the notification section would work and how important it is? Would this need a separate page for itself?

How does the user access their starred breathing techniques? Also think about the idea of grouping them as well by types.

Learnings/Future changes

Implementing in branding aspects and elements within the application - to ensure its aesthetically sound.

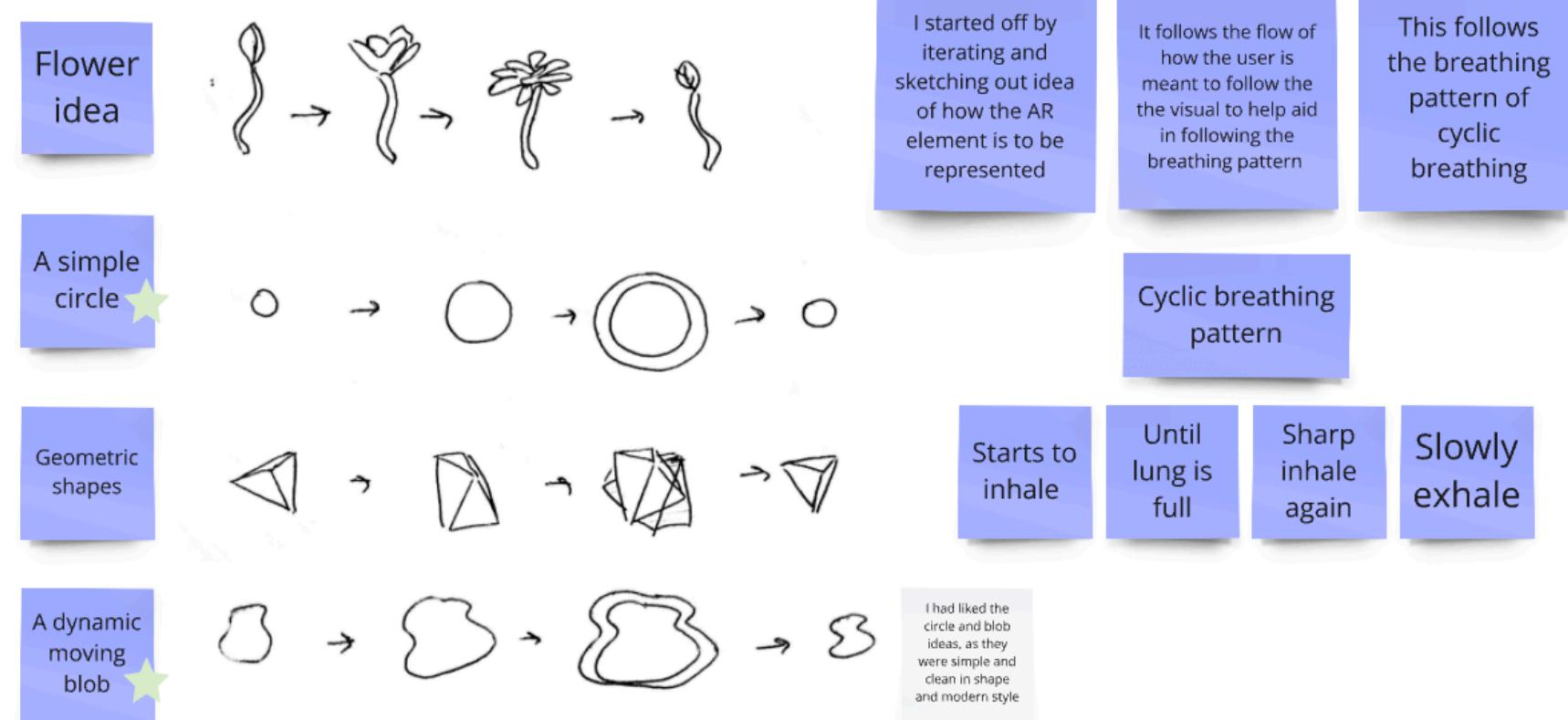
Looking into making the notification page into a favourites page instead, such that the user is able to access their favourite breathing techniques easily for convenience.

Will look into separating each of the breathing techniques into groups to be more easily found by topic/section

IDEATION PHASE

FIRST AR PROTOTYPE

I started off sketching out ideas for my AR prototype. I wanted this AR to be an object that was animated based on the breathing pattern from the breathing techniques. The users can then follow these animations, syncing their own breathing with it. I had sketched out the pacing of the animations following the **cyclic breathing pattern**.

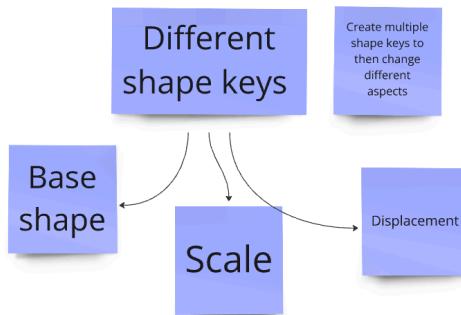


IDEATION PHASE

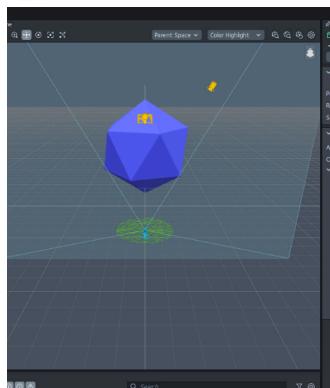
FIRST AR PROTOTYPE

I started with creating my first AR prototype to see mainly how the animation would work within an AR space, creating a simple 3D model to test this out. I used Blender for the modelling and animation and Lens Studio to help output this into an AR space.

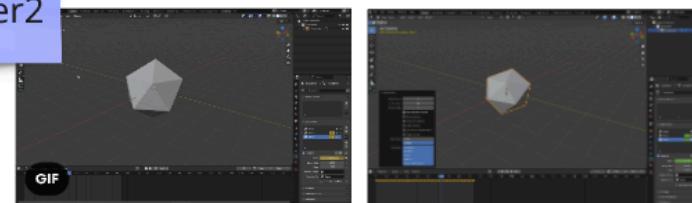
Timing sequence for cyclic breathing



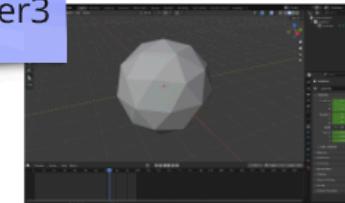
Exporting in FBX



ver2

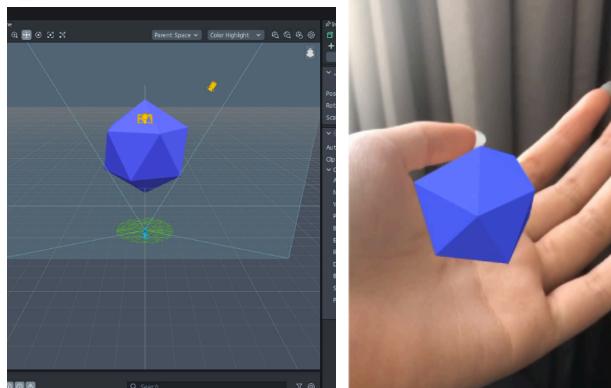


ver3



No shape keys

To test animation differences with shape keys and without
Also used for rendering for exporting differences between shape keys and mesh changing animation



Link to the first AR prototype

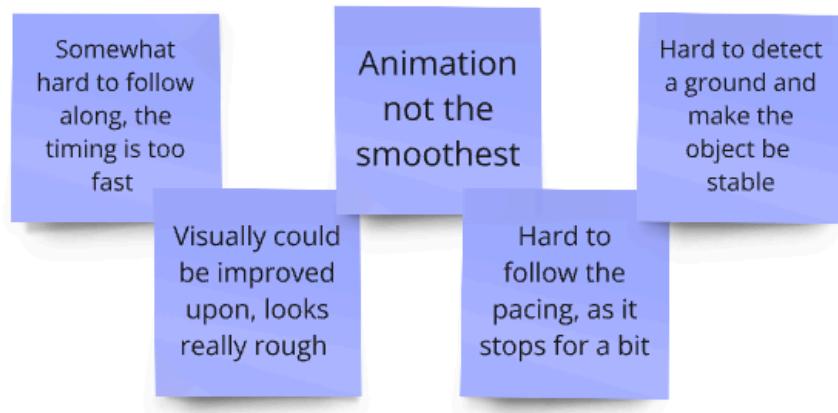


IDEATION PHASE

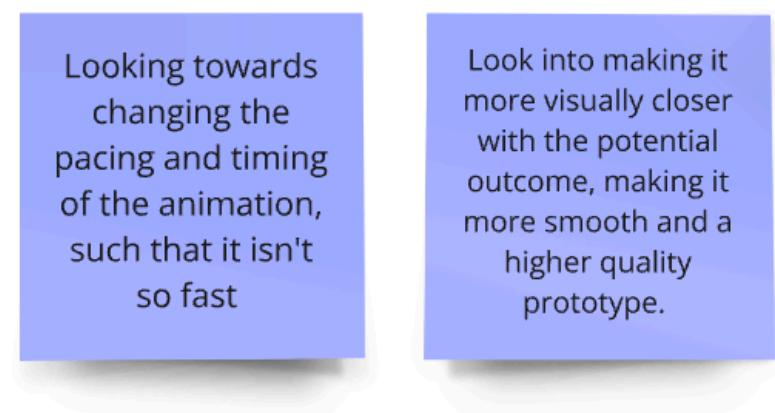
FEEDBACK ON TESTING FOR AR

I then gained feedback following the first prototype of the AR, using this feedback to iterate back on my prototypes and plan out my future changes.

Feedback



Learnings/Future changes

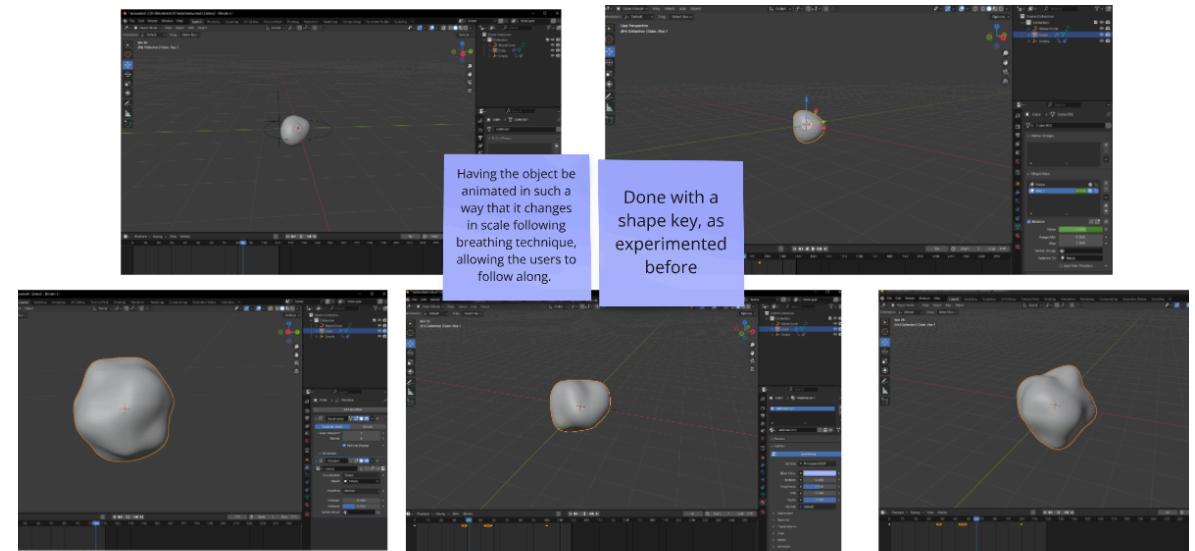
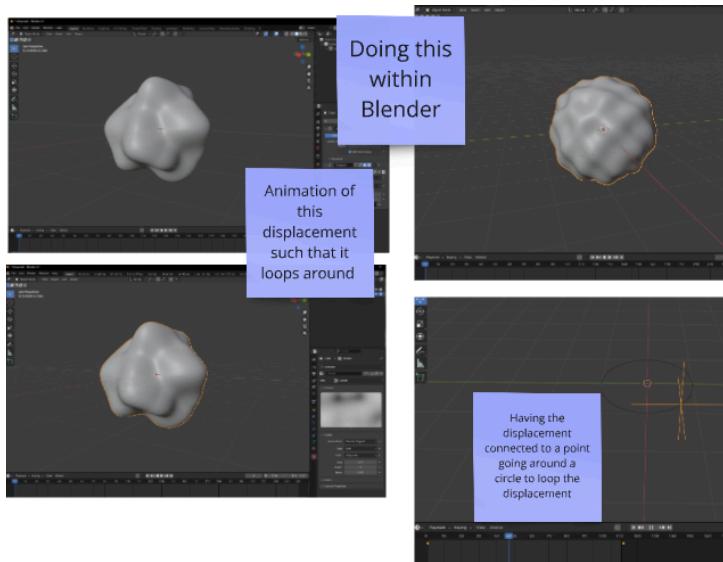


IDEATION PHASE

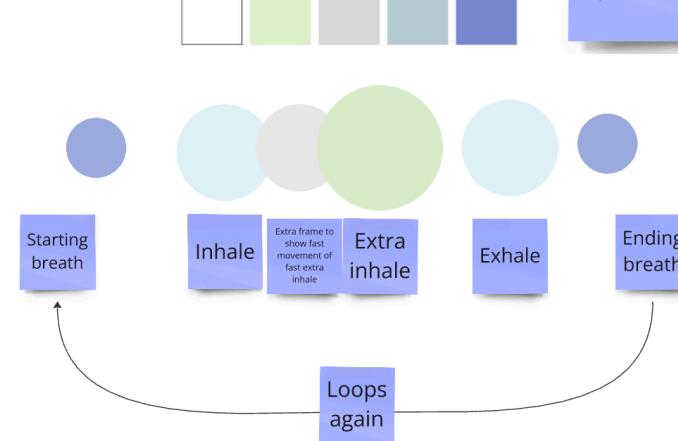
SECOND PROTOTYPE FOR AR

I then started on my second prototype for the AR section, looking mainly into creating a more aesthetic outcome and making the **3D model** more round and modern, fitting in with the mood boards from previously.

I made a blob with the help of displacement within **Blender**. I also planned out the colour of the material to change with each section of the breathing technique to indicate a new section to the user and make it clear when the object is transitioning between inhaling and exhaling.



Link to the second AR prototype



IDEATION PHASE

TESTING ON SECOND AR PROTOTYPE

I then gained feedback following the second prototype of the AR, using this feedback to iterate back on my prototypes and plan out my future changes.

Feedback

I love the overall look of this, looks very round and clean.

I find this hard to follow along with, had I was not told what to do or how to follow it, I would be very confused.

Like the 3D model and how it looks, however its somewhat confusing, I'm unsure about the pausing in the middle of the animation, this could be hard to follow.

Potential for texturing on the 3D model?

Learnings/Future changes

Look into implementing some sort of instructions to help aid the user in following along

Look into implementing my idea for the colours changing or at least change the material to a nicer texture.

IDEATION PHASE

BRANDING

Colours

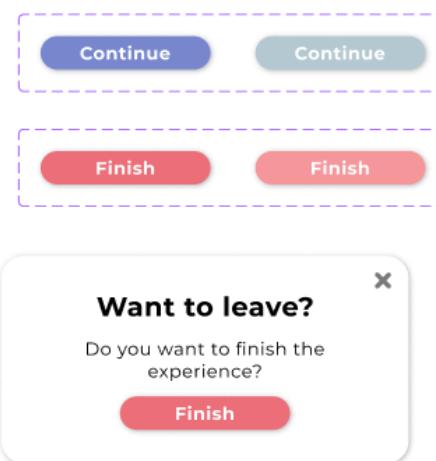


fonts

TITLE

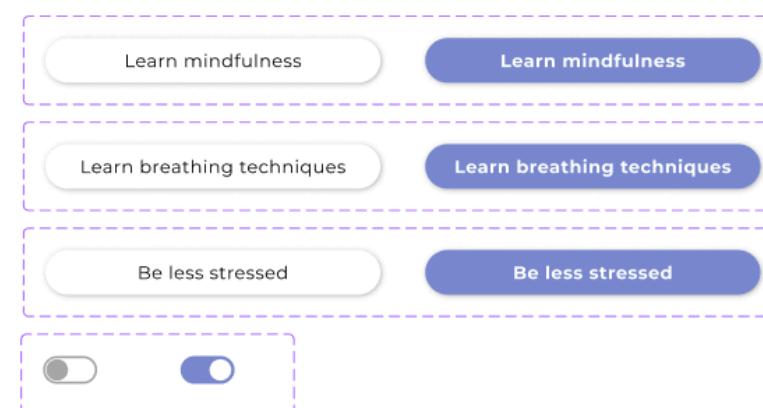
Subtitle

body



BREATH HARMONY

ICONS



CARDS



IMPLEMENTATION PHASE

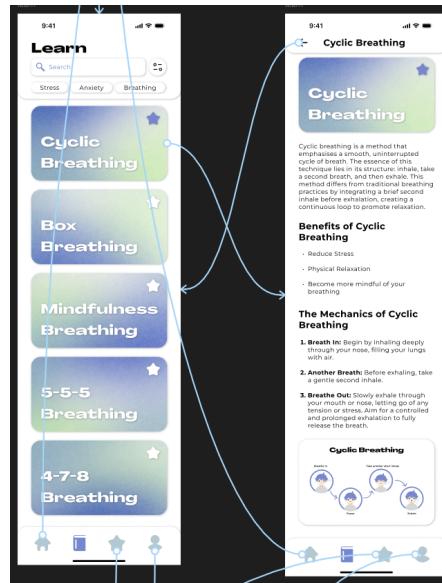
I'll look into making this a **feasible** and **real** idea to create an **impact** with this research. I'll test the concept to see how **effective** the idea is, gaining **feedback** from stakeholders such as participants and users.

IMPLEMENTATION PHASE

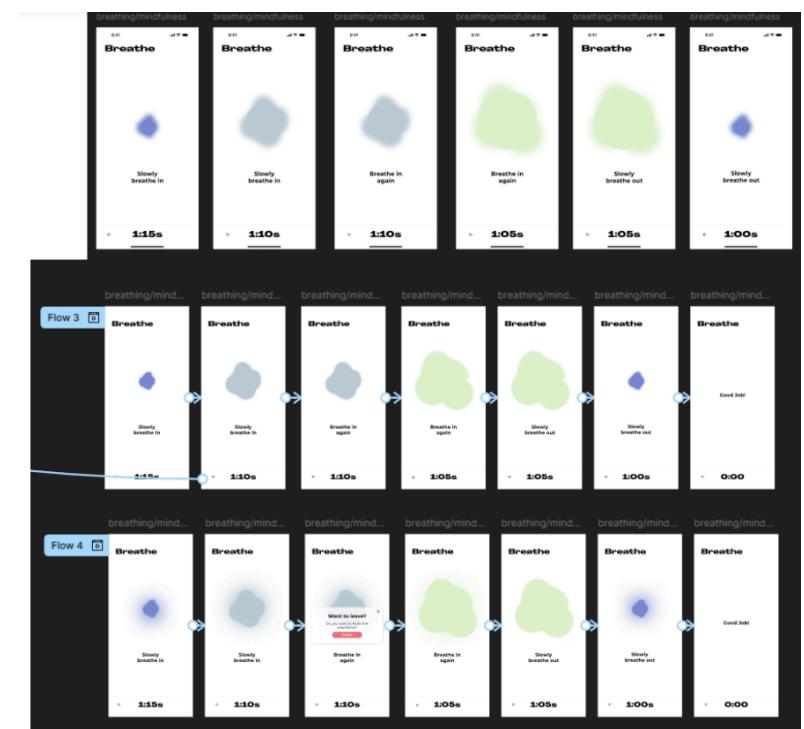
FINAL FIGMA PROTOTYPE

Following the feedback given, I started on my final **Figma** prototype, implementing branding and fully prototyping the application.

This page showcases the many changes and iterations I had done as I went about making this prototype.



Link to
final Figma
prototype



IMPLEMENTATION PHASE

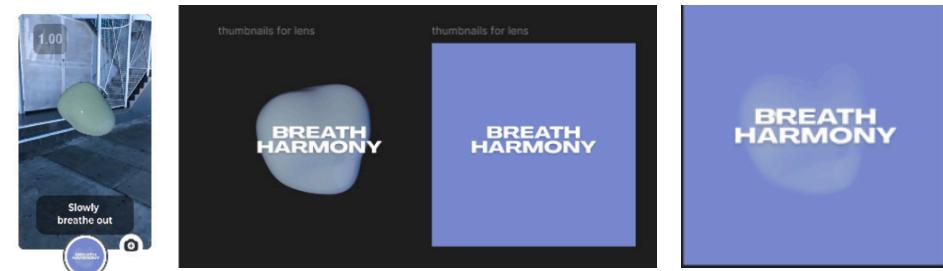
FINAL AR PROTOYPE

I started with my final output of the AR implementation. This looked into changing the colour of the 3D object as it animated within Lens Studio. I also added text instructions to the AR to help the user with what to do.

I finalised the AR prototype within **Lens Studio**, using its **WebAR** function and uploading an icon for it.

This prototype can be seen within the QR code on the right side of this page.

Link to final AR prototype



Node coding for changing the colours of the 3D object

loops for 5 secs

goes from one colour to the other overtime

```
function eventTrigger(){
    count++;
    if (count >= script.material.length){
        count = 0;
    }
    for (var i = 0 ; i < script.mesh.length; i++){
        script.mesh[i].clearMaterials();
        script.mesh[i].addMaterial(script.material[count]);
    }
    for (var k = 0 ; k < 10; k++){
        n+=;
        var o = n % 5;
        switch (o) {
            case 0:
                eventTrigger();
                break;
            case 1:
                eventTrigger();
                break;
            case 3:
                eventTrigger();
                break;
            default:
                print("def");
            }
            print("+" + o);
        }
}
```

Testing with coding for the timing of the changes of the colours, such that they loop within itself.

Breathe in again

Video editing in for the text pop up within the AR segment

IMPLEMENTATION PHASE

FINAL TESTING OUTPUTS

I then tested my prototype with the AR implemented in the Figma prototype, linking it externally. This allowed me to test them both together.

Below is the final testing of the prototypes and what could be gained from it.

Feedback

Its so interesting how you got the AR to be implemented within the application, would love to see this be not a pop up/external link but within the application!

Good work
- I like the mobile application

Felt like better data organization could be done for the user analytics

Love the branding and consistently within the mobile application, however it does feel like the AR isn't so strongly linked back to this same branding within this prototype

Learnings/Future changes

Look into improving on the AR to fit the branding of the mobile application better

Changes for the profile section of the mobile application can be done

IMPLEMENTATION PHASE

FUTURE PLANS

For the end of the implementation phase, I looked into the future plans of Breath Harmont, looking into what can be further done and improved upon, but also what would need to be done to help make this feasible.

Future steps

Look towards working with professionals to ensure better quality of the outcome

implementing the many different types of breathing exercises within AR format

Look into marketing for the project

A look into other mindfulness techniques

Help spread for information on mindfulness and allow for more users to use the application

Product Related

Marketing via posters and business cards that can be interactive

Look into creating more detailed reports on the data for the users

Potential look into gamification of the application, helps the users to continue using the application

Look into creating VR environments and AR with the hololens and headsets to expand on the technology used

INTRODUCING

BREATH HARMONY

FINAL OUTPUT

BREATH HARMONY

The final output is Breath Harmony, a mobile application that lets young adults learn and use mindfulness and breathing techniques when in a time of need.

A product that helps when in a time of need to quickly alleviate mental distress in a more problem-focused method rather than avoiding it.

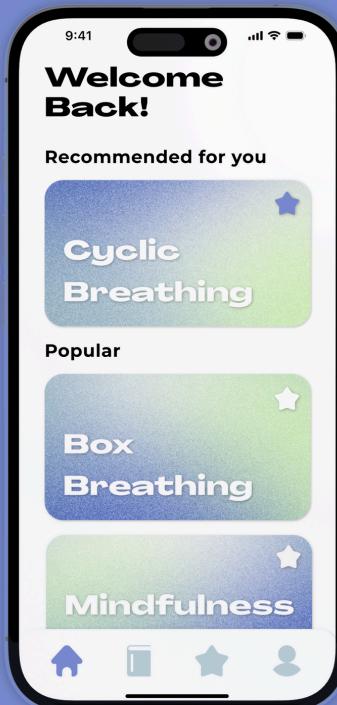


37

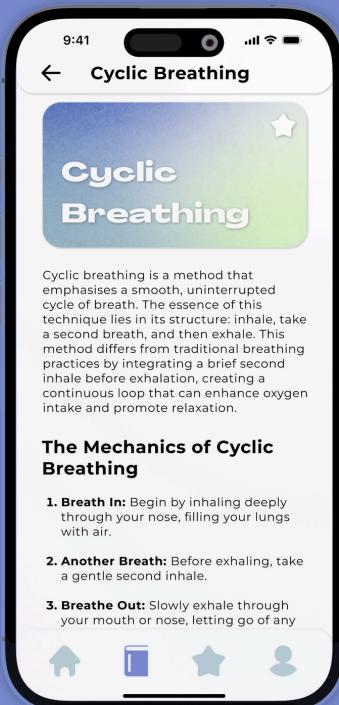
FINAL OUTPUT

HERO SHOT/MAIN FEATURES

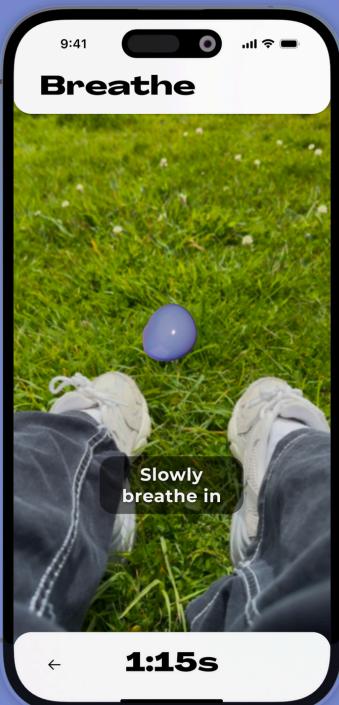
MAIN FEATURES



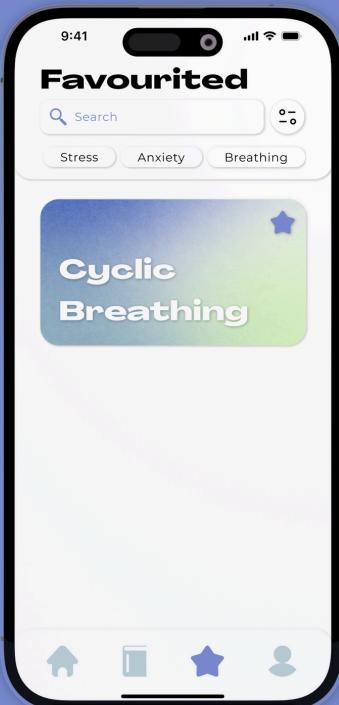
PERSONALISED
HOME PAGE



LEARN
MINDFULNESS



IMMERSIVE
GUIDING AR



SAVE YOUR
FAVORITES



KEEP TRACK
OF YOUR PROGRESS

FINAL OUTPUT

HERO SHOT



MINDFULNESS



AUGMENTED REALITY

Helping young adults use problem-based alleviation techniques for their day-to-day stress

EMERGING TECHNOLOGY STREAM REQUIREMENTS

HOW DOES MY RESEARCH ALIGN WITH THIS BRIEF?

My research looks to under the question of *"How might we utilise mindfulness techniques and XR to quickly alleviate mental distress immersively, such as stress and anxiety, for young adults?"*

My project aligns with the brief as it mainly uses the emerging technologies of XR, AR and UI/UX to aid and address mental distress.

Breath Harmony is a mobile application that provides users with an AR experience that helps guide them in breathing techniques that aid in general stress and anxiety that young adults can experience. Being a product that also provides an experience to aid mental health issues, mainly mental distress of stress and anxiety.

Reflecting on my project, I find that my research does align with the final testing and implementation phase, as users were able to learn more about mindfulness and breathing techniques, which aid in mental health. These were presented using emerging technologies of UI/UX and were made to be further enhanced with the usage of AR.



EMERGING TECHNOLOGY STREAM REQUIREMENTS

FIVE PROS OF USING TECHNOLOGY TO ADDRESS MENTAL HEALTH

Accessibility

Technology can make it more convenient for users to gain access to help. It bridges between locations and geographic distances. Making help and accessibility of this information and products that aid mental health easier. Technology-based products are often free or could be given on trial, which can also give users help at a lower cost.

Emerging technologies and interest

Since these emerging technologies are new, people are interested in these technologies and what they are capable of.

This can gain interest into how these technologies could approach wicked issues and mental health-related problems for users, giving an initial interest in the products related to/utilising these technologies.

Immersive

These emerging technologies are immersive and engaging, making it possible for users to gain more appeal from these methods of approaching these problems.

Insights with Data

The use of technology can allow for these products to be more easily analysed, creating products that can utilise insights and trends from the usage of digital products to then help personalise the technology for the user.

Anonymity

The usage of technology can allow users to gain help through more private means without experiencing the public shame of gaining help for mental health.

EMERGING TECHNOLOGY STREAM REQUIREMENTS

FIVE CONS OF USING TECHNOLOGY TO ADDRESS MENTAL HEALTH

Digital Divide

Not everyone has access to digital devices, nor do they have internet access. This can make it so that digital-based products won't be able to access some parts of the public, especially those needing it the most.

Public fear of technology

The public may not be too trusting of the technologies used or not have the knowledge within them to trust them. The public may find that the services and technology used are not needed and thus may not use these methods of help.

Negative Physical impacts

Depending on the technology used, the user's body may be physically compromised as they use technology, such as back pain, eye strain and neck pain from general screen devices. Headaches and nausea from headsets.

Access to emerging technologies

Specifically, VR and AR headsets can be costly, and as such, these implementations can be hard for users to get into due to the cost of starting them.

Lack of human touch

Due to the usage of technology, there can be a lack of human touch or emotions within these applications. A lack of empathy and human connection which are needed when dealing with mental health issues.

REFERENCES

- Anderson, A. (2020, December 3). New UAlberta-developed augmented reality app helps Canadians manage mental health during COVID-19. <https://www.ualberta.ca/rehabilitation/news-and-events/news/2020/december/new-ualberta-developed-augmented-reality-app-helps-canadians-manage-mental-health-during-covid-19.html>
- Balban, M. Y., Neri, E., Kogon, M. M., Weed, L., Nouriani, B., Jo, B., Holl, G., Zeitzer, J. M., Spiegel, D., & Huberman, A. D. (2023). Brief structured respiration practices enhance mood and reduce physiological arousal. *Cell Reports Medicine*, 4(1), 100895. <https://doi.org/10.1016/j.xcrm.2022.100895>
- Bhandari, P. (2021, October 18). *Ethical Considerations in Research | Types & Examples*. Scribbr. Retrieved June 2, 2024, from <https://www.scribbr.com/methodology/research-ethics/>
- Boeldt, D., McMahon, E., McFaul, M., & Greenleaf, W. (2019). Using virtual reality exposure therapy to enhance treatment of anxiety disorders: Identifying areas of clinical adoption and potential obstacles. *Frontiers in Psychiatry*, 10. <https://doi.org/10.3389/fpsyg.2019.00773>
- Comprehensive mental health action plan 2013-2030. (2021). World Health Organization.
- Empathic Computing Lab. (n.d.). *About US - Empathic Computing Lab*. Retrieved June 3, 2024, from <http://empathiccomputing.org/about-us/>
- Franklin, D. M., Silvestro, C., Carrillo, R. A., Yang, Y., Annadurai, D., Ganesan, S., Vasantham, D. S. J., Mettu, S., Patel, M., Patil, M. S., & Akurathi, N. D. (2023). The impact of meditation aided by VR technology as an emerging therapeutic to ease cancer related anxiety, stress, and fatigue. *Frontiers in Virtual Reality*, 4. <https://doi.org/10.3389/fvr.2023.1195196>
- Headspace Inc. (2024). *Meditation and sleep made simple - Headspace*. Headspace. <https://www.headspace.com/>
- Ideo.Org. (2015). *Field Guide to Human-Centered Design*.
- Jain, S., Kuppili, P. P., Pattanayak, R. D., & Sagar, R. (2017). Ethics in Psychiatric Research: Issues and recommendations. *Indian Journal of Psychological Medicine*, 39(5), 558–565. https://doi.org/10.4103/ijpsym.ijpsym_131_17
- Jones, T. S., & Richey, R. C. (2000). Rapid prototyping methodology in action: A developmental study. *Educational Technology Research and Development*, 48(2), 63–80. <https://doi.org/10.1007/bf02313401>
- Konaszewski, K., Niesiobędzka, M., & Kolemba, M. (2023). Coping and Mental Health during Emerging Adulthood. The Relationships between Coping Strategies and Risk of Depression and Life Satisfaction among Students in Higher Education. *Polish Psychological Bulletin*. <https://doi.org/10.24425/ppb.2022.141139>

REFERENCES

- Liu, Z., Ren, L., Xiao, C., Zhang, K., & Demian, P. (2022). Virtual Reality Aided Therapy towards Health 4.0: A Two-Decade Bibliometric Analysis. *International Journal of Environmental Research and Public Health/International Journal of Environmental Research and Public Health*, 19(3), 1525. <https://doi.org/10.3390/ijerph19031525>
- Marenus, M. W., Murray, A., Friedman, K., Sanowski, J., Ottensoser, H., Cahuas, A., Kumaravel, V., & Chen, W. (2021). Feasibility and effectiveness of the Web-Based WeActive and WeMindful interventions on Physical activity and Psychological Well-Being. *BioMed Research International*, 2021, 1–11. <https://doi.org/10.1155/2021/8400241>
- Mental Health Foundation. (2018). Stress: Are we coping? <https://www.mentalhealth.org.uk/sites/default/files/2022-08/stress-are-we-coping.pdf>
- Minds, C. (2022, July 18). RecOVRy Virtual Reality Experience — Changing Minds. Changing Minds. <https://www.changingminds.org.nz/currentprojects/recovery-virtualreality-project>
- Ministry of Health NZ. (2019). Annual Update of Key Results 2018/19: New Zealand Health Survey. <https://www.health.govt.nz/publication/annual-update-key-results-2018-19-new-zealand-health-survey>
- Misran, N. a. B., Marof, A. A., & Kamarudin, M. S. (2023). The role of Mental Health Self-Stigma and mindfulness in Youth Psychological distress during COVID-19: a study in Johor, Malaysia. *International Journal of Academic Research in Business & Social Sciences*, 13(17). <https://doi.org/10.6007/ijarbs/v13-i17/19809>
- National Centre for Research Methods (NCRM). (2017, June 1). Creative Research Methods - Technology and mixed methods research (part 2 of 3) [Video]. YouTube. <https://www.youtube.com/watch?v=4vhXUJQecVA>
- Ngamkham, S., Holden, J. E., & Smith, E. L. (2019). A Systematic Review: Mindfulness Intervention for Cancer-Related Pain. *Asia-Pacific Journal of Oncology Nursing*, 6(2), 161–169. https://doi.org/10.4103/apjon.apjon_67_18
- Oh, V. K. S., Sarwar, A., & Pervez, N. (2022). The study of mindfulness as an intervening factor for enhanced psychological well-being in building the level of resilience. *Frontiers in Psychology*, 13. <https://doi.org/10.3389/fpsyg.2022.1056834>
- Pazer, S. (2024). Integration Technology into Mental Health Care: A Comprehensive Analysis of AI, VR, and Telemedicine. *Review Paper*. <https://doi.org/10.13140/RG.2.2.26086.64329>
- Pons, P., Navas-Medrano, S., & Soler-Dominguez, J. L. (2022). Extended reality for mental health: Current trends and future challenges. *Frontiers in Computer Science*, 4. <https://doi.org/10.3389/fcomp.2022.1034307>

REFERENCES

- Raber, J., Arzy, S., Bertolus, J. B., Depue, B., Haas, H. E., Hofmann, S. G., Kangas, M., Kensinger, E., Lowry, C. A., Marusak, H. A., Minnier, J., Mouly, A. M., Mühlberger, A., Norrholm, S. D., Peltonen, K., Pinna, G., Rabinak, C., Shiban, Y., Soreq, H., . . . Boutros, S. W. (2019). Current understanding of fear learning and memory in humans and animal models and the value of a linguistic approach for analyzing fear learning and memory in humans. *Neuroscience & Biobehavioral Reviews/Neuroscience and Biobehavioral Reviews*, 105, 136–177. <https://doi.org/10.1016/j.neubiorev.2019.03.015>
- Roquet, C. D., & Sas, C. (2018). Evaluating Mindfulness Meditation Apps. Conference: CHI'18 Extended Abstracts on Human Factors in Computing Systems. <https://doi.org/10.1145/3170427.3188616>
- Seabrook, E., Kelly, R., Foley, F., Theiler, S., Thomas, N., Wadley, G., & Nedeljkovic, M. (2020). Understanding how virtual reality can support mindfulness practice: Mixed Methods study. *JMIR. Journal of Medical Internet Research/Journal of Medical Internet Research*, 22(3), e16106. <https://doi.org/10.2196/16106>
- Torous, J., Nicholas, J., Larsen, M. E., Firth, J., & Christensen, H. (2018). Clinical review of user engagement with mental health smartphone apps: evidence, theory and improvements. *Evidence-based Mental Health*, 21(3), 116–119. <https://doi.org/10.1136/eb-2018-102891>
- TRIPP. (2024, May 15). TRIPP. <https://www.trip.com/>
- TRIPP, Equa Health partner to offer clinically-backed VR mindfulness. (2023, January 26). MobiHealthNews. <https://www.mobihealthnews.com/news/tripp-equah-health-partner-offer-clinically-backed-vr-mindfulness-training>
- Vial, S., Boudhraâ, S., & Dumont, M. (2022). Human-Centered Design Approaches in Digital Mental Health Interventions: Exploratory Mapping review. *JMIR Mental Health*, 9(6), e35591. <https://doi.org/10.2196/35591>
- Watson, E., Fletcher-Watson, S., & Kirkham, E. J. (2023). Views on sharing mental health data for research purposes: qualitative analysis of interviews with people with mental illness. *BMC Medical Ethics*, 24(1). <https://doi.org/10.1186/s12910-023-00961-6>
- Wilson, A., & Nicolson, M. (2020). *Mental health in Aotearoa: Results from the 2018 Mental Health Monitor and the 2018/19 New Zealand Health Survey*. : Te Hiringa Hauora/ Health Promotion Agency. https://www.hpa.org.nz/sites/default/files/Mental_Health_Aotearoa_Insight_2020.pdf
- Zuo, X., Tang, Y., Chen, Y., & Zhou, Z. (2023). The efficacy of mindfulness-based interventions on mental health among university students: a systematic review and meta-analysis. *Frontiers in Public Health*, 11. <https://doi.org/10.3389/fpubh.2023.1259250>

■ ACADEMIC HONESTY DECLARATION AND DISCLAIMER

DISCLAIMER

This design project was developed for the advanced capstone university course. As a class project, there was no engagement with external communities beyond the course staff, classmates, and each stream industry partner.

ACADEMIC HONESTY DECLARATION

By completing this assessment, I agree to the following declaration:

- I declare that this assessment is my own work, except where acknowledged appropriately (e.g., use of referencing).
- I declare that this work has been made, this semester, for this course.
- I declare that this work has not been submitted for academic credit in this course or another University of Auckland course, or elsewhere.
- The use of generative AI tools in coursework is permitted only with prior permission. This means: Students can use generative artificial intelligence text and art generation software, such as ChatGPT and DALL.E 2, on their assessments in this course, but only with prior permission from the instructor. Without permission, you are expected to complete assessments without substantial assistance, including from automated tools. If you are given permission to use such tools, you must acknowledge this. Please include a written statement with any assessment that uses AI explaining what you used the tool for and what prompts you used to get the results.
- I am aware the University of Auckland may use Turnitin and any other plagiarism detecting methods to check my content.

Any breach of this statement or identified academic misconduct will be followed up and may result in disciplinary action.