

Integrating Mindfulness: Enhancing Art and Design Student Well-being
through AI Voice Assistants and Wearable Technology

By

Prathistha Gera

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ABSTRACT

Recognizing the specific constraints of their academic and creative work, this study focuses on how an AI-enhanced application may provide personalized support for mindfulness and well-being for art and design students. Using Research through Design and Research for Design approaches, it develops a user-centric application that allows for accessible and tailored mindfulness exercises via voice interactions. The project's scope was primarily focused on integrating voice assistant technology to determine its usefulness in engaging students in mindfulness activities. This study seeks to provide light on innovative approaches to improving well-being and creativity among students in creative fields by evaluating the app's usability and impact on facilitating mindfulness.

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CHAPTER 1 – INTRODUCTION

○ Personal Motivation

The journey began when I moved to Canada, fulfilling my childhood dream, and securing admission in my dream college. Everything was going according to plan, and I was ready to embrace the challenges of this new country. However, the reality of being far from my family and friends soon hit me. The search for new relationships was a harsh reality check, and personal hardships led to an anxiety attack in class, with no one to confide in. I found myself rushing to the washroom, calling someone back in India to help calm me down. The next realization that I needed someone to talk to, someone who could empathize and help calm my anxious mind, prompted me to explore available resources within my college, but asking for help was a struggle. Coming from a household where the importance of mental health was not recognized, accepting that I was not okay was a significant challenge for me. Being vulnerable in front of strangers was a daunting task, but it was a step I had to take for my well-being.

However, the journey to seek help proved to be arduous, requiring substantial effort. It became clear that what I truly needed was a someone or something where I could be heard at the right time a realization that underscored the critical importance of prompt and accessible mental health resources.

This experience underscored the critical importance of being heard and supported, particularly during moments of vulnerability. During this time, a therapist recommended that I take part in a mindfulness program offered exclusively to art and design students at OCAD University. I was initially skeptical about the effectiveness of such programs, but to my surprise, they had a profound impact on me. I found myself able to express more, and I gained confidence in ways I never thought possible. The struggles with anxiety attacks and the need for someone to talk to during classes underscored the importance of mindfulness

practices in fostering well-being and creativity. Additionally, my involvement in the OCAD Mindfulness Peer Mentor Program further reinforces my personal connection to the project's purpose, as I actively support other students in their mindfulness practices.

As my journey as a peer mentor in the OCAD Mindfulness Peer Mentor Program progressed, I came to a profound realization. Supporting other students allowed me to observe first-hand the diverse needs of art and design students, who face unique challenges and stressors in their academic and personal lives. It fuelled my determination to create a solution that would meet their specific requirements, ensuring that others would not have to go through the difficulties I did. I wanted to create something that could provide immediate, empathetic, and accessible support to art and design students, allowing them to navigate their unique journey with greater ease and confidence.

- **Project Significance and Theoretical Motivation**

During my involvement with the OCAD U Mindful Campus Initiative (*About Mindful Campus / Mindful Campus, 2023*), I noticed a significant barrier to mindfulness practice among students: the difficulty of incorporating mindfulness sessions into their already hectic schedules. Many people expressed a desire for a solution that could adapt to their time constraints, allowing them to practice mindfulness whenever it was convenient for them. This observation, combined with the prevalence of smartphones in their daily lives, sparked the concept for the Mindfulness App. The App concept emerged as a potential way to provide a flexible and accessible platform for those who could benefit from it, allowing students to engage in mindfulness practices that fit into their lifestyles. It is essential to recognize that mindfulness does not require any tools; at its core, it is about taking a moment to be present. However, the app is intended as a support for those who find it challenging to carve out that moment in their day, offering guided sessions that can help facilitate this practice even in limited time frames.

My involvement with the OCAD U Mindful Campus Initiative, which was created in collaboration with the Centre for Mindfulness Studies in Toronto (*About Mindful Campus / Mindful Campus*, 2023), significantly strengthened my thesis project's theoretical foundation and conceptual framework. Through specialized training in mindfulness-based programs tailored for art and design students, I gathered insights into foundational mindfulness theories such as Mindfulness-Based Cognitive Therapy (MBCT), Mindfulness-Based Stress Reduction (MBSR), and Mindful Education and Training for Resilience (MTER) (Online Mindfulness Programs | Centre for Mindfulness Studies, n.d.). These theories, when combined with practical modules such as "Mindfulness Building Blocks," "Personal Mindfulness," "Interpersonal Mindfulness," and "Building Your Mindful Toolkit" (<https://mindfulcampus.ca/group-classes#program-modules>) (*Sign up for Group Class.*, n.d.), highlighted the critical role of mindfulness in promoting the well-being and creative growth of art and design students.

This project was thus conceived as a unique synthesis of mindfulness practice and cutting-edge technology, with the goal of meeting the specific needs and challenges of art and design students. By combining my knowledge of mindfulness with the capabilities of AI, machine learning, and wearable technologies, the project aimed to provide personalized mindfulness experiences that could reduce stress, boost creativity, and promote overall well-being in the demanding environment of art and design education. This endeavour not only aligned with my personal and professional interests but also contributed to the growing body of research on the intersection of mindfulness and digital technologies. It lays the groundwork for an effective discussion about mental health and creativity in educational settings, even as it anticipates additional validation. This approach has highlighted the potential of tailored digital solutions to improve student well-being, adding a preliminary but valuable contribution to the discussion about integrating mindfulness and technology.

○ Research Summary

The Problem

Art and design students face unique pressures, such as the need for constant creativity, meeting strict deadlines, and dealing with subjective evaluations of their work. These stressors, combined with the competitive nature of the design industry, can exacerbate mental health problems. Studies cited by AIGA Eye on Design and The Guardian suggest a link between creative professions and an increased risk of depression, emphasizing the need for specialized mental health support for this demographic (Sample, 2018) (Gosling, 2016).

Research Question

Primary Question

"How can a mindfulness application, integrated with AI voice assistant and wearable technology, assist art and design students in their mindfulness practices?"

Secondary Questions

"What are the main stress factors and obstacles that art and design students encounter, and how can these challenges be addressed by the Mindful App through tailored mindfulness strategies and resources?"

"How does the integration of wearable technology and voice assistant into the Mindful App facilitate the practice of mindfulness and contribute to the overall well-being of art and design students?"

Objectives

- Identify and analyse stressors and mental health challenges specific to art and design students.
- Design a mindfulness application that combines technology to provide personalized user experiences.

- Assess the application's effectiveness in improving the mental health and creativity of art and design students.
- Contribute to the body of knowledge about the intersection of technology, mindfulness, and mental health support for art and design students.

Approach and Methods

The methodology for this project combines Research through Design and Research for Design approaches, with a particular emphasis on iterative prototyping. A user-centered design approach is essential from the start to ensure the app meets their specific needs and preferences. User testing is conducted at a critical stage, involving a structured session where art and design students interact with the app and provide valuable feedback. This feedback is critical for assessing the chatbot or voice assistant's usability, responsiveness, and impact on students' well-being and creativity, as well as guiding targeted improvements. By taking this comprehensive approach, the project hopes to create a technologically sophisticated yet accessible tool that meets the unique challenges and needs of art and design students.

Scope and Limitations

During this testing phase, a select group of OCAD University students, chosen as representatives of the larger art and design student community, will provide targeted feedback on the app's design, usability, and the effectiveness of AI-driven voice assistance in facilitating mindfulness practices.

The project's limitations are multifaceted, primarily stemming from the focused user testing group made up entirely of OCAD University students, which may not fully represent the diverse challenges and needs of art and design students around the world. A significant limitation was the small number of participants involved in the user testing, which inherently limited the breadth and diversity of feedback received. This constraint, coupled with

conducting only a single user testing session, restricted the depth of feedback and insights obtained regarding the app's long-term effectiveness and usability.

Technological and resource constraints also prevented a thorough exploration of wearable technology integration, resulting in a design-focused prototype rather than a fully functional application. These limitations highlight the need for additional research and development to improve the app's functionality, expand its user base, and better assess its impact.

- [Chapter Overview](#)

Chapter 2 - Review chapter contains an in-depth review of existing literature. This chapter concludes by identifying the current research gap and contextualizing this thesis project within the larger academic landscape, illustrated by relevant works and studies. This review establishes the project's theoretical and empirical foundation.

Chapter 3 - Describes the research methodologies and methods used in the project, such as Research through Design and Research for Design approaches. It explains why iterative prototyping, user-centered design, and user testing were chosen as the primary methods for developing and refining the mindfulness app and voice Bot.

Chapter 4 - Significance of naming and gender choices in mindfulness app design chapter delves into the critical considerations surrounding the naming and gender choices for the voice assistant within the mindfulness app design.

Chapter 5 - Focuses on the core development process, describing the iterative prototyping journey of the mindfulness app and its integrated voice Bot, as well as some initial wearable prototypes. It documents the initial self-evaluation phase, the incorporation of user feedback, and the changes made to improve the app's functionality, usability, and user experience in response to targeted input from art and design students.

Chapter 6 - Investigates the user testing and self-evaluation phase. The chapter discusses the findings considering the literature review and theoretical framework, assessing the project's success and areas for improvement.

Chapter 7 - Summarizes the research's key findings and contributions, while also reflecting on the project's limitations and lessons learned. It also outlines potential future directions for extending the app's capabilities, broadening the user base, and conducting longitudinal studies to assess the sustained impact of technology-supported mindfulness practice

CHAPTER 2 - LITERATURE AND CONTEXTUAL REVIEW

○ Introduction

Mental health concerns have long been a silent epidemic affecting our generation and even those before us. Despite this, it remains a topic that many shy away from discussing. The COVID-19 pandemic, has left a trail of physical and psychological trauma in its wake, significantly impacting our mental health (National Institutes of Health, 2022). Mental health is a complex and expansive field with many sides, each needing unique approaches and theories for resolution.

Mindfulness, an introspective practice with roots in ancient traditions, has gained significant recognition for its role in enhancing well-being and mitigating stress today. It is not a newfound practice; it has been around since ancient times. Originating from Buddhist spiritual traditions over 2000 years ago, it has been adopted in the West for therapeutic purposes to enhance physical and mental well-being by alleviating chronic pain, stress, and anxiety, and aiding in emotional regulation (Li et al., 2023). Mindfulness, defined as the art of being fully present and aware of the current moment without judgment, has emerged as a potent tool for fostering mental health and psychological resilience. It encourages self-reflection and heightened awareness of each moment's conscious experience, helping to alleviate stress and anxiety. The mind is centered in the present moment with non-judgmental acceptance (André Godoi Chiovato et al., 2021).

The concept of mindfulness can be easily understood by examining our responses to stress or challenging situations in our daily lives. For instance, instead of succumbing to a stressor in a “reactive” manner, we can modify our response to a “relaxation” response through mindfulness practice. This approach enables one to confront stressful situations more healthily (Wrede et al., 2023).

Incorporating small practices into daily routines can be effective in combating unseen challenges (Pal et al., 2018). However, as part of the community, it is important to recognize the unique challenges faced by art and design students. They grapple with distinct stressors such as constant pressure to be creative, stringent project guidelines, and the need to balance artistic expression with academic rigor. Given the increasing recognition of mental health and well-being among students, it is crucial to customize mindfulness interventions to their unique needs.

- **Mindfulness and Well-Being**

Mindfulness, a practice of being fully immersed in the present moment, involves a non-judgmental awareness of one's thoughts, emotions, and sensations. This simple yet profoundly impactful technique has been shown to enhance mental and emotional well-being. Rooted in Buddhist philosophy, mindfulness is not something to be acquired or attained. Instead, it is an innate resource within everyone, awaiting activation through simple practices (*About Mindfulness · Centre for Mindfulness Studies*, n.d.) and (Edirisooriya et al., 2019).

In today's fast-paced, success-driven society, stress has emerged as a significant threat to people's well-being (Honinx et al., 2023). With one in three individuals experiencing stress daily, our bodies often resort to a systemic fight-or-flight response. Chronic stress is believed to have detrimental effects on both our physical and mental health, leading to conditions such as anxiety, insomnia, and loss of focus (Honinx et al., 2023). One of the primary advantages of mindfulness is its ability to alleviate stress (KU et al., n.d.). By addressing stressors with equanimity and a non-judgmental attitude, individuals can mitigate the physiological and psychological impacts of stress. This stress reduction capability has substantial implications for overall well-being and mental health. Furthermore, mindfulness can enhance cognitive functioning and focus, aiding individuals in improving their concentration, problem-solving abilities, and decision-making skills.

Numerous studies have demonstrated that mindfulness can effectively reduce stress and anxiety. It has been incorporated into various workplaces to assist employees in managing work-related stress and achieving mental well-being. Mindfulness interventions in workplace settings have been shown to reduce employee stress levels (Wrede et al., 2023). These interventions aim to teach people how to incorporate mindfulness practices into their daily lives (Shapero et al., 2018). They concentrate on learning or improving mindfulness through formal mental exercises like breathing meditation or body scans (Michaelsen et al., 2023). These interventions can be delivered in a variety of ways, including group sessions with trainers and participants interacting face to face, as well as individual sessions. Furthermore, digital platforms such as webinars, online seminars, and mindfulness apps can be used to support both delivery types (Michaelsen et al., 2023). Mindfulness has also been found effective in reducing mood and anxiety symptoms among patients with anxiety and mood disorders (Shapero et al., 2018).

However, it is not just workers who experience stress; students also face many pressures in their academic lives that can significantly impact their mental health and overall growth. The mental health of students has garnered attention over recent years. The Center for Collegiate Mental Health has identified the increasing prevalence of student anxiety as a challenge for colleges and universities and emphasized that providing services for the general student body should be a top priority (Van Lith et al., 2021).

Mindfulness and Creativity

Art and design students embark on an educational journey characterized by a blend of creativity and academic rigor, which necessitates the consistent generation of original ideas, adherence to project deadlines, and balancing of artistic expression with intellectual achievement. This is a group of the population that faces distinct sets of challenges setting them apart from the population of the other groups of students primarily because of the nature

of the design industry characterized by long hours at work, stressed projects, and in some instances frenzied working environment. Such conditions can enhance latent mental health conditions and supposedly creative environments harbour these issues more commonly than others (Gosling, 2016) According to The Guardian, in 2014, creative professionals including painters, musicians, writers, and dancers have around 25% more likely carry gene variants that are related to depression compared to fewer creative professions like farmers, manual laborers, and salespeople (Sample, 2018). This data would seem to suggest that the criteria for creativity, often an identity revolving around belonging to an artistic society or working in art or literature, may not fully embrace the creative capacity of the individual yet underscoring a noted link between creativity and mental health challenge.

Also, as seen in the case of art and design students, the constant pressure to be innovative and original may not only drain a student physically but also mentally and emotionally. And as art itself is subjective, this can be further intensified by the continuous involvements in comparison to other works which promotes jealousy, inadequacy, or imposter syndrome where student artists may question talents and actual existence within their field. Depression comes out as a common problem amidst these individuals, alcoholic propensity alongside suicidal tendencies emphasizing the need for specialized mental health support (Reddy et al., 2018). Although the body of research surrounding reasons why art and design students might benefit from more direct mindfulness practices is not extensive, such results are contextually supported by extant research supporting the general applicability of mindfulness in stress management and the development of emotional resilience. Taking into consideration, it can be said that the mindfulness of the art and design students must be specialized to help them overcome their special problems and anxieties.

- [Technology and Mindfulness](#)

Wearable Technology and Fidget toys in Mindfulness

Wearable devices like biometric-measuring smartwatches hold significant potential for future-oriented mindfulness training (Wrede et al., 2023). For instance, features like breathing practice on the Apple Watch provide real-time feedback, offering valuable insights into users' physical and emotional well-being. This makes wearable technology a compelling addition to the mindfulness landscape.

Moreover, wearable technology can be combined with fidget tools designed to help individuals redirect restless energy and maintain focus. These tools are widely available and can aid in reducing anxiety. Various fidget toys available in the market cater to all ages and are incorporated into everyday items like rulers or cubes. Fidget toys are believed to enhance productivity by curbing wandering thoughts, and Fidget Cubes are designed for anxiety relief (Croley et al., 2023). The tactile aspect of fidget toys can be used to manage restlessness and enhance the mindfulness experience by keeping users in the moment. Despite some studies claiming their effectiveness in coping mechanisms, others do not have a result. While they have received favourable coverage in popular media outlets like *The Atlantic* and National Public Radio, there is limited evidence supporting their effectiveness for students (Croley et al., 2023).

Fidget toys offer textures, shapes, and features that can be touched and manipulated. This helps ground users in the present moment and heightens their sensory experience—how the toy feels, its temperature, and the physical sensations it creates. This heightened sensory awareness is a crucial aspect of mindfulness. Tactile experiences are often preferred as they are easy to engage with and less distracting. Similarly, devices with auditory feedback such as music have shown positive results in reducing depression and anxiety (Honinx et al., 2023). These technologies can help students understand the effectiveness of their mindfulness techniques and provide a sensory outlet for restlessness.

While more research is needed to fully understand their effectiveness, particularly among art and design students, these technologies hold significant potential. They represent an

exciting frontier in our ongoing quest to improve mental health and well-being in our fast-paced, stress-filled world.

Mindful Apps with Voice Assistant AI

A mindfulness app is a technology-based application that contains guided meditation sessions. These apps can help make meditation easier and more intuitive, whether you're a beginner or a pro (McCormick & Owens, 2024). Mindful Apps have seen a rise in usage due to their accessible interface and the broad spectrum of mindfulness practices they offer. These apps include guided meditations, breathing exercises, and stress management tools. However, despite the multitude of apps available in the market, only a few are relevant or specifically target certain issues. A 2015 survey revealed that only one out of thirteen apps are backed by research evidence (Lahtinen et al., 2021). These generalized apps often lack personalized features, which are essential as everyone has unique requirements that cannot be met by standard mindfulness Apps. These apps engage users through gamification and reward systems, track fitness and daily emotions, and can be easily incorporated into daily routines. Over time, evidence has shown that mindfulness apps increasingly cater to individuals seeking peace during challenging times in their lives (Lahtinen et al., 2021).

On the other hand, the amalgamation of Mindfulness Apps with voice assistant AI has ushered in new opportunities for guided mindfulness practices. Voice assistant AI, integrated into various devices, has seen exponential growth (Guha et al., 2022). Entities like Siri and Alexa have ventured into the realm of mindfulness by providing verbal guidance and reminders for mindfulness practices. The potential of voice assistant AI in guiding mindfulness practices stems from its ability to create a seamless and immersive experience for users. Voice assistants

¹ Reviewing mindfulness applications, it was noted that the applications "Calm," "Headspace," and "Pause" differ from the one created for this study in that they do not have voice assistants integrated into their platforms. Every app has its own features and cost, with "Calm" and "Headspace" being a little more expensive than the more reasonable "Pause." I only interacted with their free versions, which might not have all the features of their subscriptions.

offer a more personalized feel and foster a sense of connection as they can be customized to feel familiar. For instance, we usually refer to Alexa or Siri as 'she' rather than 'it' (Guha et al., 2022). It has been proven that this gives consumers a feeling of connectedness towards non-human agents (Guha et al., 2023). AI can understand consumers and provide relevant feedback as well as personalized exercises.

What Makes AI Conversational: Designing for Engagement in Mindfulness Apps

Conversational chatbots, also known as dialogue systems, are software programs that simulate conversations with human users, mostly over the Internet. These technologies are being used in a variety of sectors, including customer service, information retrieval, educational aid, and entertainment, establishing a strong presence in today's digital interactions (Lin et al., 2023). Chatbots appeal to a wide range of user preferences, with some, including myself, finding nonverbal engagement with chatbots more comfortable than dealing with human customer care executives. This preference derives from a lack of confidence in verbal communication, emphasizing the significance of chatbots in allowing a more accessible form of engagement, notwithstanding occasional mismatch with specific user needs. With the evolution of AI technologies, these chatbots have shown remarkable improvements in facilitating natural and meaningful conversations, although challenges persist in perfectly mimicking human behaviour and enhancing user interaction (Abdalkareem, 2020).

Conversational AI, which includes chatbots and voice bots, requires a deep understanding of technology, psychology, and user experience design. This is critical for developing systems that not only interact but also connect with consumers on a deeper level. Silva and Canedo (2022) established three major conversational design strategies: naturalness, transparency, and emotionality, which are critical in establishing meaningful

interactions between chatbots and their users. Naturalness makes the discussion feel authentic, transparency is essential for the chatbot's competency and efficiency, and emotionality improves the relationship, which is closely aligned with the chatbot's stated goal.

The need to achieve human-like interactions in chatbots has been a focus of research, as demonstrated by Hill et al. (2015), who investigated the subtle differences between human-human and human-chatbot talks. Achieving actual conversational quality is dependent on the AI's capacity to keep the discussion flowing, store context between exchanges, and dynamically alter responses based on recognized emotional indicators and user inputs. Context-awareness is critical for generating appropriate responses in multi-turn discussions, emphasizing the need for AI systems to properly use conversational history (Yan, 2018). This feature ensures that a bot comprehends the situational context within a conversation considering prior interactions user preferences and even the present emotional undertone thereby boosting the efficiency of context delivery (Khare, 2024). Furthermore, adding emotional intelligence to chatbots is becoming increasingly popular. Efforts are being made at developing chatbots more empathetic, capable of identifying and responding to user emotions. This is accomplished by AI's capacity to tailor responses based on user feelings, hence enhancing overall interaction quality. Such qualities enable chatbots to show understanding and empathy, making conversations feel more personal and engaging (Silva & Canedo, 2022).

The literature also mentions the necessity of "audience design" in conversational AI, as addressed by Dippold. Dippold (2022) argues that audience design in conversational AI is critical for improving user experience. This entails adapting chatbots to distinct user groups' language philosophies and rapport expectations, rather than adopting a general method. Such personalization is especially important in my project, which aims to create a mindfulness

voice assistant for art and design students. Incorporating aspects that are familiar to this population, such as local slang and industry-specific terms, can dramatically improve the system's relatability and efficacy.

- **Mindfulness Interventions for Art and Design Students**

The academic journey, while exhilarating, can pose significant emotional challenges to students. Despite the efforts of many large universities to provide resources, the growing demand often overburdens university counselling centres, leading to the implementation of waitlists and restrictions on the number of free sessions per student (Van Lith et al., 2021). This is where technology can step in as a crucial aid. Mobile applications can equip students with tools to effectively manage their thoughts and emotions. These apps offer a range of mindfulness exercises and cognitive behavioural techniques that students can access at their convenience. Additionally, voice assistants can simulate human-like conversations, providing students with a sense of being listened to. These apps not only distribute information but also foster a sense of community across geographical boundaries. A specific mindful digital workplace intervention recommended various meditation plugins for practice during work (e.g., Headspace plugin in Microsoft Teams) (Wrede et al., 2023).

For art and design students, creativity is not just about learning but also about professionalism as they must eventually earn a living from it. This constant pressure to monetize their creativity can often feel burdensome and impact their mental state. A study explored the link between mindfulness and creativity among students in arts and design colleges. It revealed how mindfulness helped them foster creativity by removing emotional blocks. It also highlighted the therapeutic quality of creative activities for mental and emotional health (Henriksen et al., 2022). There is a call for more research to support the mental and emotional needs of undergraduate creatives like artists, musicians, designers, etc.

(Henriksen et al., 2022) The study proposed that mindfulness practice could be particularly beneficial and promising in this context.

- **Contextual Review**

For my contextual review, I chose the following to explore technology assisted mindfulness solutions I specifically opted to investigate the potential of the iFidgetCube (Woodward & Kanjo, 2021) as a representative of fidgety wearables deviating from the more commonly discussed digital wellness tools such as smartwatches and rings. My interest gravitated towards alternatives providing mindfulness support in a non-digital tangible manner. The iFidgetCube stands out by merging the physical activity of fidgeting with the capacity to monitor and enhance mental wellbeing offering a fresh direction away from screen based interactions.

On the other hand, The BMind smart mirror (*CES 2024: Baracoda Unveils BMind, the World's First Smart Mirror for Mental Wellness | Baracoda, 2024*) immediately caught my eye due to its integration of Generative AI for interactive conversations and natural language processing for sentiment analysis within an everyday object—the mirror. This fusion is especially captivating because mirrors are part of our daily lives often associated with self-reflection and preparation. Embedding AI powered mental wellness support into such a ubiquitous item is innovative suggesting a seamless blend of technology and mindfulness that enhances users regular routines without intruding.

iFidgetCube

'iFidgetCube: Tangible Fidgeting Interfaces (TFIs) to Monitor and Improve Mental Wellbeing' by Kieran Woodward and Eiman Kanjo (Woodward & Kanjo, 2021). This paper discusses the vital need of assessing well-being, especially given today's stressful lifestyle. The present review highlights the potential of technology in fostering well-being, particularly

for those dealing with stress and mental health issues. This aligns well with the themes covered in the literature review.

The "iFidgetCube" study highlights the transformative potential of tactile interfaces in addressing mental health concerns and makes a substantial contribution to the growing body of research on technology-assisted mindfulness interventions. "iFidgetCube" combines non-invasive physiological sensors and a microcontroller with traditional fidgeting cubes. It is designed to provide a physical engagement strategy that reduces stress to monitor and improve mental well-being. Non-invasive sensors and fidgeting processes are combined in the iFidgetCube to promote relaxation and reduce restlessness. It can be utilized as a preventive tool to mitigate the effects of high stress levels and enhance overall wellbeing. The device also employs deep learning algorithms to infer mental wellbeing from the collected sensor data. This tangible example underscores the notion that strategically designed fidget tools can augment mindfulness practices and contribute to stress reduction, resonating with the principles outlined in the literature review.

It offers a distinctive combination of characteristics, including the capacity to collect labelled data from the actual world, enable a range of sensory activities, and contain sensors that are frequently missing from other wearables. Its conclusions point to a possible course of study for mindfulness and technology in the future. It Combines traditional mindfulness practices with modern wearable technology to offer a unique stress relief tool.

BMind Smart Mirror

This review investigates the interaction of mindfulness practices and technology, with an emphasis on how AI voice assistants can enhance mindfulness applications designed for art and design students. This literature examines the advent of AI-powered mindfulness product, as represented by the debut of BMind, the world's first smart mirror for mental wellness produced by Baracoda.

The integration of technology into mindfulness practices adds a new level of accessibility and personalization. BMind, serves as a health companion capable of assessing a user's mood and controlling stress via a touchless, interactive experience (*CES 2024: Baracoda Unveils BMind, the World's First Smart Mirror for Mental Wellness | Baracoda, 2024*). BMind, which uses the CareOS platform, a privacy-by-design, intuitive open platform, integrates easily into daily routines and provides individualized mental wellness suggestions. (*CareOS - the First Smart Health & Beauty Platform for the Bathroom.*, n.d.) The mirror uses Generative AI for dynamic conversation and coaching experiences, as well as Natural Language Processing (NLP) for reliable sentiment analysis.

This technological basis allows BMind to modify its recommendations to the user's present mental state, resulting in a personalized approach to mindfulness that includes guided meditation, self-affirmation, and light therapy sessions (*CES 2024: Baracoda Unveils BMind, the World's First Smart Mirror for Mental Wellness | Baracoda, 2024*).

This convergence of AI and mindfulness introduces a novel way to support mental well-being, promising a more accessible and personalized approach to mindfulness for art and design students and beyond.

Both the review illuminates the evolving landscape of mindfulness practices, driven by technological advancements that promise more accessible, engaging, and effective mental health support.

- [Summary and Takeaways from Literature Review](#)

The insights from the literature review being added to the Mindfulness App project shows a commitment to helping art and design students with their unique mental health challenges. The project was created based on the detailed look at mindfulness and well-being. It aims to provide a special tool using technology to support these students' specific needs. Knowing the pressures and difficulties that come with art and design school, the Mindfulness

App tries to lower stress, boost creativity, and promote overall well-being through personalized mindfulness practices. This research directly uses what the literature found about mindfulness reducing stress and improving mental health. It shows how important it is to have approaches that are easy to use and made for creative students.

By bringing together AI, machine learning, and wearable tech, the Mindfulness App offers an innovative solution that mixes the latest tech advancements with the proven benefits of mindfulness. This approach aims not only to provide quick support for students but also adds to a broader understanding of how tech can be used to improve mental health and creativity within educational settings.

In the end, the Mindfulness App project shows a practical use of what the literature review found, proposing a forward-looking solution to the mental health challenges identified among art and design students. Through this project, the goal is to create a more helpful, creative, and mentally healthy environment for students navigating the demanding landscape of art and design education.

CHAPTER 3 - METHODOLOGIES AND METHODS

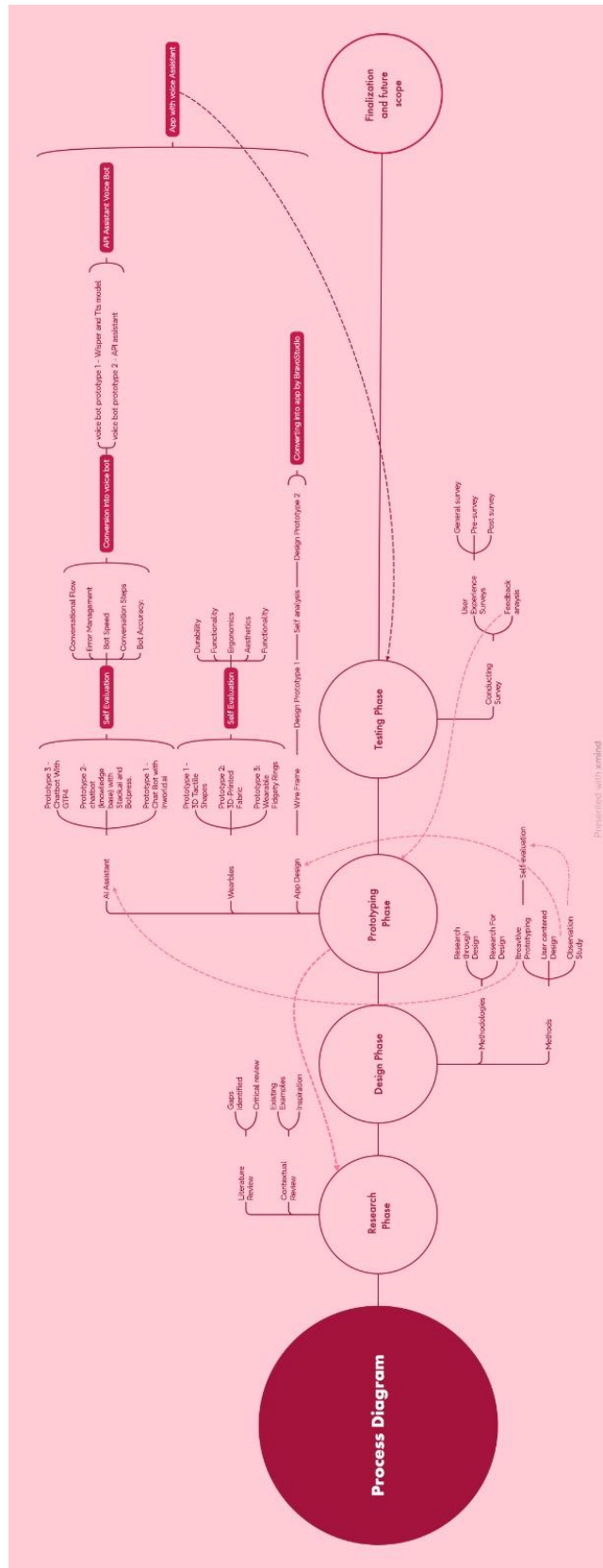


Figure 1- Thesis process diagram.

○ Methodology

In this chapter I will explore the methodologies and methods that form the foundation of the research conducted for the creation and evaluation of a mindfulness app with voice assistant ai tailored specifically for art and design students. The examination and analysis centre around two primary methodologies: Research for Design and Research through Design. These approaches have guided the conceptualization design and iterative refinement of the app and voice assistant. Moreover, I will delve into the specific methods used to engage with and understand our target user group. These methods include User Centered Design which has shaped the development process by prioritizing the needs preferences and experiences of art and design students. Iterative Prototyping enabling us to refine through continuous self-assessment. Participant Engagement directly involving users in the design process to ensure the apps relevance and usability and Observation Study helping me gain a nuanced understanding of user interactions usability challenges and the overall user experience from a first-person perspective.

Research for Design

The concept of "Research for Design" is dedicated to supporting, guiding, and advancing design practices. This type of research documented the processes and concerns of professional designers and treated designers and their practice as the object of their study (Godin, n.d.), It primarily involves the gathering of information and data before and during the design phase to acquire specific details about the context in which the design is created. Research for Design outlines the process of knowledge acquisition and analysis for designers to ensure that their outcomes are based on scientific and rational foundations (Sebastian 2023). This methodology mainly focuses on understanding the user their needs and preferences while exploring various materials and technologies that can assist in the development of design solutions It plays a critical role in user-centered design by

incorporating technical feasibility usability studies of prototypes and early phase participative studies on user requirements are conducted to ensure the outcomes align with the target audiences' requirements (Stappers and Giaccardi 2015).

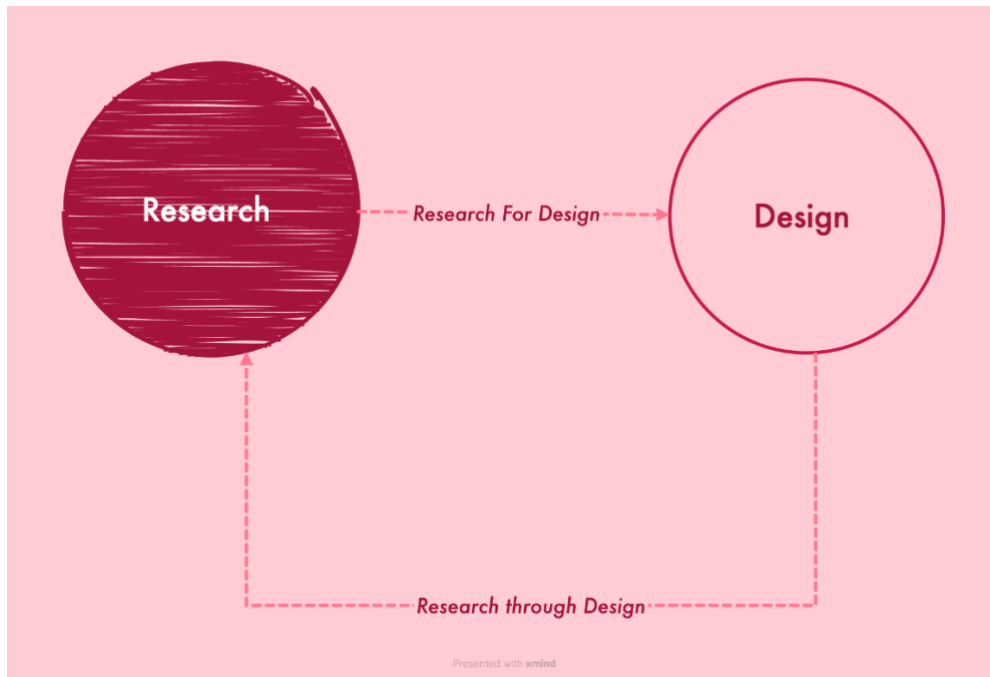


Figure 2 - "Note. Adapted from 'Research through Design' by P. Stappers and E. Giaccardi, 2014, in *The Encyclopaedia of Human-Computer Interaction*, 2nd Ed. Retrieved from <https://www.interaction-design.org/literature/book/the-encyclopedia-of-human-computer-interaction-2nd-ed/research-through-design>."

Research Through Design

Research through Design (RtD) a methodology that intricately intertwines design activities as the primary components in the process of producing and conveying knowledge (Stappers & Giaccardi n.d.). This approach transforms the design process into a form of research offering a distinctive perspective. RtD thrives on iteration, where designers engage in a continuous cycle of creating, reflecting, and refining. This methodology revolves around creating tangible artifacts to delve into research inquiries and foster innovative insights. Unlike traditional research methods RtD emphasizes leveraging design practice as an inquiry tool allowing researchers to explore intricate design challenges through development of

prototypes rather than abstract theories or models. Creating a prototype (or artifact) precise enough to be mistaken for a product is central to the knowledge generating process (*Research through Design*, 2015). Particularly beneficial for university scholars where students often devise inventive design solutions for complex problems (Aydın Baytaş, 2022). This methodology allows the exploration of complex issues through design resulting in innovative solutions that undergo evaluation. It allowed me to engage with different situations which might be only possible while doing iterative cycle of design, self-reflection, and evaluation.

○ Methods

User-centered design

During the creation of the mindfulness app, I utilized user centred design techniques. These methods focus on understanding the needs, preferences, and behaviours of our target users (Interaction Design Foundation 2019). By placing users at the core of the design process I assess design decisions based on their impact on end users. The techniques I utilized included wireframing and iterative prototyping.

I used wireframing to visualize the layout, navigation, and features of the app, and to explore distinctive design options. I used tools such as unizard.ai, Adobe Figma, and Figma to create and edit the wireframes. The wireframing process added new features and elements being added incrementally to tailor the app specifically for art and design students. This continuous wireframing approach allowed me to incorporate elements uniquely suited to the target user group's needs.

Iterative prototyping

Iterative design is characterized by a cyclic process of prototyping, testing, analysing, and refining a product or process (*Iterative Design*, 2020). Iterative prototyping was used to refine the app based on self-evaluation and usability testing. The design and functionality of the app were improved to ensure that it met the user's needs and expectations. Features and functions were added, removed, or modified to enhance the app's effectiveness in promoting mindfulness. Users navigated the conversation flow, the intuitiveness of the chatbot responses, and overall user satisfaction. These insights were used to refine and improve the voice assistant conversation flow, making it more effective and user-friendly.

Self-Evaluation in Iterative Prototyping: An Insider's Perspective

During the iterative prototyping phase, I strategically used self-evaluation, a key internal review mechanism, to leverage my dual role as a developer and a member of the target user group. This unique positioning enabled an in-depth, empathetic evaluation of each prototype using predefined criteria encompassing usability, design principles, and user experience goals. Working in this dual capacity allowed me to conduct in-depth reviews from an insider's perspective, ensuring that technical performance and design elements not only met project standards but also resonated deeply with the nuanced needs and expectations of art and design students.

Observational Study

Observational studies serve as one of the primary methods for addressing the research question utilizing direct observations to gain valuable insights. This methodical approach aims at collecting detailed qualitative data by engaging in direct observations and participatory techniques as elucidated by George in 2022. Observations play a crucial role in both exploratory and explanatory research providing a solid understanding of phenomena within their authentic context. For this study I opted for participant observation a technique

carried out in real life settings where the researcher integrates into the participant group for a prolonged period. This immersive involvement fosters a deep connection and insightful perspective on the subject matter (George 2022). What distinguishes this study is that I am adopting dual roles as both an observer and a participant aligning with the participatory observation method. The immersive nature of this technique allows for a thorough exploration and its deductive nature assists in evaluating whether the collected data validate the identified themes and concepts (George 2022). This systematic analysis aids in confirming the initial assumptions using empirical evidence derived from observations.

Participant engagement and volunteer recruitment

In the development of the mindfulness app, the recruitment of volunteers was essential to ensure the app aligned with the specific needs and preferences of art and design students. Initial insights were gathered through a comprehensive survey questionnaire. This questionnaire was distributed via messages in WhatsApp groups, and emails, targeting specifically the demographic of art and design students. This effort aimed to recruit volunteers to engage with the app, which at this stage was primarily a functional prototype designed to offer users as close an experience to the intended final product as possible.

The study received approval from the Research Ethics Board (REB) to conduct both the general survey and user testing strictly following ethical research standards. Owing to challenges in recruiting a large number of participants the app testing was carried out with a smaller group of 4 people. The app testing session lasted for one hour segmented into three parts. The initial 15 minutes were devoted to the pre-questionnaire allowing participants to provide their responses. This was followed by a 30-minute engagement with the app voice assistant and tailored mindfulness practices. The session closed with 15 minutes for post session queries and feedback. Involvement in both the survey and app testing was limited to

art and design students from Toronto ensuring that the received feedback and insights were directly applicable to the target user group.

While researching the issues and problems faced by art and design students, I encountered existing literature but also identified a significant gap in this area of research. This led me to question whether my chosen user testing group—art and design students at OCAD University—had encountered specific issues and what their main stressors were during their educational journey. Although I am part of this user group and have some insights, I opted for a survey to avoid my personal experiences introducing bias into the findings (see Appendix A for survey questions).

I received 13 responses using Microsoft Forms, which I chose because of its data security and analytical capabilities. The platform's innovative features, such as Cross Distribution Analysis, Association Rule Analysis, Correlation Analysis, and Sentiment Analysis, made it much easier to extract insightful data (Si Meng, 2018) (Microsoft Forms - Free Tool to Create Online Surveys, Forms, Polls, and Quizzes, n.d.).

The responses provided clarity on the stressors and mental health issues unique to art and design students. Many students find their journey stressful because of the uncertain path to a steady source of income, the subjective nature of design that requires constant creativity and competitiveness, challenges in concept development, creative blocks, and the pressure of tight deadlines.



Figure 3 - screenshot of responses from Microsoft forms analysis insights.

Surprisingly, given the subjective nature of design, I anticipated that feedback would have a significant impact on students' mental health. However, the majority of respondents reported receiving feedback constructively, valuing only the critiques that they found useful. While students have a variety of stress-management strategies, mindfulness was not widely used to cope with stress, anxiety, or negative emotions that affect creativity. Many people were either unaware of mindfulness techniques or felt they didn't have time to practice them. Almost 85% of respondents were willing to try mindfulness using a tailored app with a voice assistant, indicating a strong demand for such a tool. This feedback further motivated my thesis project, emphasizing the significant potential impact of a mindfulness app designed specifically for the needs of art and design students.

In summary, the initial exploratory phase using Research for Design to develop a foundational understanding of user needs and employing Research through Design for the iterative advancement and refinement of the mindfulness voice Bot. each step has been meticulously chosen to ensure a user centered design process. Observation study methods and personal reflections have played a crucial role in gathering additional insights while the survey results have provided deeper understanding of the challenges faced by art and design students.

CHAPTER 4- SIGNIFICANCE OF NAMING AND GENDER CHOICES IN MINDFULNESS APP DESIGN

o Gender Choices in Voice Assistants: Insights and Implications

Voice-automated assistants, utilized by nearly 3 billion individuals globally for a variety of tasks, predominantly feature female voices and identities, such as Alexa, Siri, and Cortana (Fisher, 2021). This extensive adoption reflects not merely user choices, but also more profound psychological and social factors. Female voices are frequently associated with

maternal and caring features, which evoke a motherly presence that many users recognize and find comforting. Studies, including those by Griggs (2011), indicate an innate response to maternal voices, suggesting that these preferences may stem from fundamental human experiences.

Aside from the emotional resonance of female voices, practical concerns also impact this decision. Research reveals that female voices pronounce vowel sounds more clearly, improving understandability, particularly in contexts when communication clarity is critical (Fisher, 2021). This characteristic is especially prized in noisy situations or when multitasking, which are frequent in today's fast-paced world. The preference for female voices in voice-automated systems mirrors broader industrial trends. Historically, text-to-speech technologies have been developed with a concentration on female voices, owing to the availability of large data sets and economic considerations (Griggs, 2011).

The decision to adopt a female voice and identity for a Voicebots, a mindfulness voicebots' designed for OCAD art students, was deeply influenced by my personal experiences and observations in the domain of voicebots and chatbots. My regular encounters with voice assistants, who are mostly female voiced, as well as my participation in mindfulness training, which is predominantly guided by women, shaped my perception of female voices as loving and compassionate. This view is consistent with academic results that highlight users' psychological comfort with female voices (Chin & Robison, 2020).

Furthermore, the choice to name the voicebots was theoretically based on Buddhism's concept of "Sati", which translates to awareness. The phrase itself, which encapsulated the essence of the chatbot's function, implied a nurturing and encouraging identity, which I felt was best portrayed by a female voice. This decision was not only a matter of personal taste, but also a reaction to society and cultural norms that equate caregiving and support with femininity.

While the use of a female voice for SATI was intentional, it is important to highlight the continuing discussion over gender bias in voice assistants. The industry's preference for female voices raises concerns about reinforcing preconceived notions and biases. Siri, Google Assistant, Alexa, and Cortana claim to be gender-neutral or beyond gender, reflecting a rising understanding and attempt to handle these complex issues (Chin & Robison, 2020). The rationale for selecting a female voice and identity for SATI was multifaceted, anchored in both personal experiences and larger industry trends.

○ Naming The App: Sukoon - A Peaceful Pause

The name "Sukoon" for the mindfulness app was inspired by extensive cultural and linguistic research, and it captures the essence of what the app aims to offer its users. In Arabic, "Sukoon" refers to a peaceful pause, similar to the serene stillness felt during a mindful moment. This concept is visually represented in Arabic script by a small circle, which indicates that the letter it accompanies should be pronounced without any additional sounds or vowels, effectively acting as a pause in the flow of speech (*What Is Sukoon (Jazm) in Arabic with Examples | Complete Guide*, 2023). This feature is perfectly aligned with the app's goal: to provide a moment of tranquillity and mindfulness in the user's day.

When choosing a name, it was critical to find a term that resonated on multiple levels, not only with my cultural background and personal connection to the Hindi language, but also with a larger, international audience. "Sukoon" emerged as an appropriate choice because it is easily pronounceable. Furthermore, the name's significance extends to its English translations—peace, rest, calm, and tranquillity (Rekhta Foundation, n.d.), which capture the app's core offerings and content. The app's mission is encapsulated in its name, which promises users a peaceful respite from the day's challenges as well as an opportunity for mindful reflection. As a result, the name is more than just a label; it represents the essence of the app and its promise to users—a peaceful respite amidst the stresses of everyday life.

CHAPTER 5 – ITERATIVE PROTOTYPING

In this chapter we embark on the iterative prototyping journey a critical aspect of the research through design methodology. We will explore the process of prototyping involving the development of a voice bot, an app, and the preliminary aspects of wearable design. The primary objective of this section is to offer you a comprehensive overview of the path towards crafting the product showcasing the gradual evolution of my designs.

○ Wearable Prototypes

Initially the idea of incorporating a wearable device with a mindfulness application was sparked by my background in fashion design. I believed that this combination could significantly elevate the appearance and functionality of the wearable. The main driving factor behind this was to design a product that individuals could actively use during mindfulness exercises to enhance their ability to stay present in the current moment. This notion was further fueled by observations of people habitually playing with pens or similar objects as well as the prevalent use of fidget tools created to improve focus and alleviate anxiety as outlined in literature by Beck (2015), Kickstarter (2020), and Croley et al. (2023). These references underline the potential of fidget toys to boost productivity and provide anxiety relief by redirecting wandering thoughts and nervous energy.

I envisioned creating a pocket sized fidget toy devoid of screens instead utilizing sensors to gather data while practicing mindfulness. The aim was to personalize mindfulness exercises based on the collected data offering a unique experience. However due to time constraints and limited resources the development of a fully operational wearable device was unattainable within the projects parameters. I conducted various experiments with 3D printed prototypes to explore and enhance the concept.

Idea

I wanted to develop wearable technology to assist in mindfulness exercises and support art and design students in managing stress and anxiety. Initially materials such as acrylic were considered but ruled out due to weight and flexibility concerns leading to the adoption of 3D printing as the primary approach for creating tactile wearables inspired by common stress relief tools.

Design Process of Prototype Development

- 3D Tactile Shapes feature four distinct shapes. Each design is intricately developed to provide a unique tactile experience aiming to enhance mindfulness through sensory engagement.
- 3D-Printed Fabric: this prototype seeks to offer a unique touch sensation by integrating of fabric into 3D prints. The procedure includes integrating fabric midway through the printing stage to yield a bendable and visually satisfying material that holds its structure post compression.
- Wearable Fidgety Rings: they are fashionable and functional. these rings are crafted to be stress relief accessories with rotating tactile surfaces that promise engaging sensory experiences.

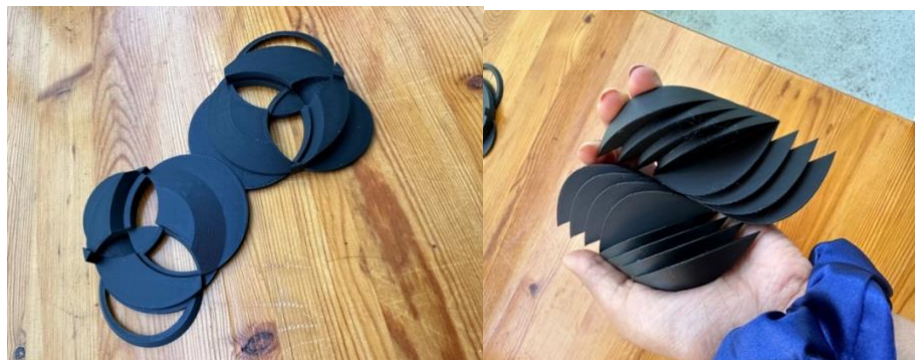


Figure 4 - 3D Tactile Shapes

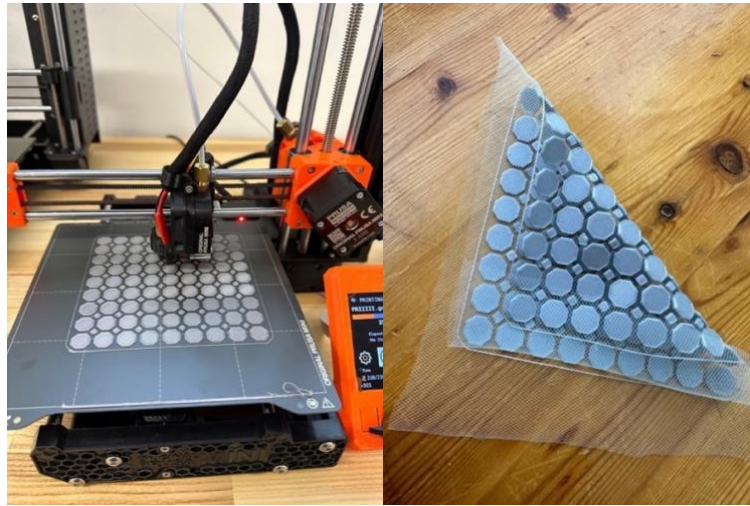


Figure 5 - 3D-Printed Fabric



Figure 6 - Wearable Fidgety Rings

Self-Evaluation of Prototypes

The prototypes underwent a thorough self-evaluation process delving into aspects of usability, functionality, ergonomics, aesthetics and durability under the guidance of established wearable design principles (Francés-Morcillo et al. 2020). This assessment identified both the strengths of the prototypes and highlighting areas needing refinement, emphasizing the critical role of material and design choices in supporting the effectiveness of mindfulness practices.

Prototype	Usability	Functionality	Ergonomics	Aesthetics	Durability
	Low - Requires explanation of purpose and use.	Medium - Achieves designed functions	Low - Needs more comfortable	Medium - Partially aligns with design	Medium - Sturdy construction offers some longevity.

3D Tactile Shapes		with room for improvement.	texture and handling.	vision, limited by resources.	
3D Printed Fabric	Low - initially, high potential if integrated into clothing.	Medium - Basic prototype with enhancement potential.	High - Comfortable and suitable for wearable integration.	Low fidelity - Indicates room for design refinement.	High - Flexible, resilient, retains shape after compression.
Rings	Medium - Intuitive and user-friendly.	Medium - Functional as a fidget device with improvement potential.	Lower due to size and texture issues; needs refinement.	Low - Basic appearance with improvement potential.	Medium - Durable materials suggest longevity.

Table 1- Self- Evaluation of wearables prototypes

Reflection

The exploration of acrylic usage in wearables initially underscored the critical role of material selection in design, prompting a shift towards 3D printing. This opened doors to tactile designs supporting mindfulness such as blending fabric with 3D prints—potential area for further investigation. The projects’ goal was to develop wearable technology that enhances mental health serving as a personalized accessory for art and design students symbolizing a continuous iterative journey to merge art design and mindfulness seamlessly.

Looking forward, this roadmap aims to blend the physical advantages of fidgety wearables with the insightful individualized guidance provided by AI voice assistants. The combined system will monitor mental health indicators while delivering immediate relaxation and mindfulness techniques offering a comprehensive resource.

○ **Chat Bot Prototypes**

Exploring the journey of the iterative prototype for the voice bot, a crucial technological aspect of my application tailored to a specific user segment, holds immense importance. This component resonates deeply with me, as I can first hand appreciate the support that comes from conversing during moments of distress. As highlighted in our literature review, the integration of Voice Assistant AI into various devices has witnessed remarkable growth, with platforms like Siri and Alexa now offering mindfulness guidance

through voice commands (Guha et al., 2023). This revolution in voice tech presents a compelling opportunity to elevate the mindfulness experience within my application.

To tackle the creation of the voice bot, I have dived into experimenting with different chatbot prototypes to gauge their impact and determine the best fit for conversion into a voice bot format. As per the insights from the literature review, these chatbots have made considerable strides in offering natural and captivating conversations. However, reproducing human interaction authentically and amplifying user engagement continues to pose a challenge (Abdalkareem, 2020). This iterative prototyping process stands as a cornerstone in developing a voice bot that effectively supports the mindfulness journey of the target audience.

Prototype 1: Inworld.ai

Idea

The initial plan involving the utilization of Inworld.ai was centered around the development of a chatbot persona. Inworld AI is well-known for its ability to simplify the process of creating AI characters that can generate content (*Inworld AI Characters & Dialogue for Unity*, n.d.) (*Inworld – the Most Advanced Character Engine for AI Npcs*, n.d.). The primary objective of the project was to design a conversational chatbot named Sati, derived from the Sanskrit term denoting mindfulness and awareness. Described as a mature woman, Sati was conceptualized as 'The Mindfulness Girl,' specifically tailored for students in the field of design. This idea emphasizes the importance of providing a reassuring and calming presence to aid students in achieving relaxation, reducing anxiety, and fostering an environment conducive to mindfulness, concentration, and creative exploration.

Design Process

The design process consisted of two major steps: character development and visual representation.

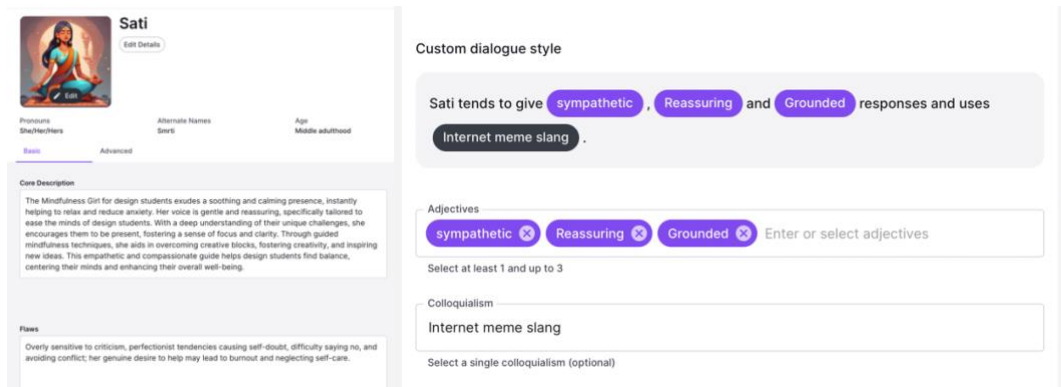


Figure 7- screenshot of character development process from inworld.ai

Character Development: A low-fidelity prototype of Sati was created using the framework provided by Inworld.AI. This entailed defining her traits to ensure she was sympathetic, reassuring, and grounded. Sati's personality was tailored to meet the unique challenges that design students face, guiding them through mindfulness techniques to improve their well-being and creativity.

Prompt used – “The Mindfulness Girl for design students exudes a soothing and calming presence, instantly helping to relax and reduce anxiety. Her voice is gentle and reassuring, specifically tailored to ease the minds of design students. With a deep understanding of their unique challenges, she encourages them to be present, fostering a sense of focus and clarity. Through guided mindfulness techniques, she aids in overcoming creative blocks, fostering creativity, and inspiring new ideas. This empathetic and compassionate guide helps design students find balance, centering their minds and enhancing their overall well-being.”

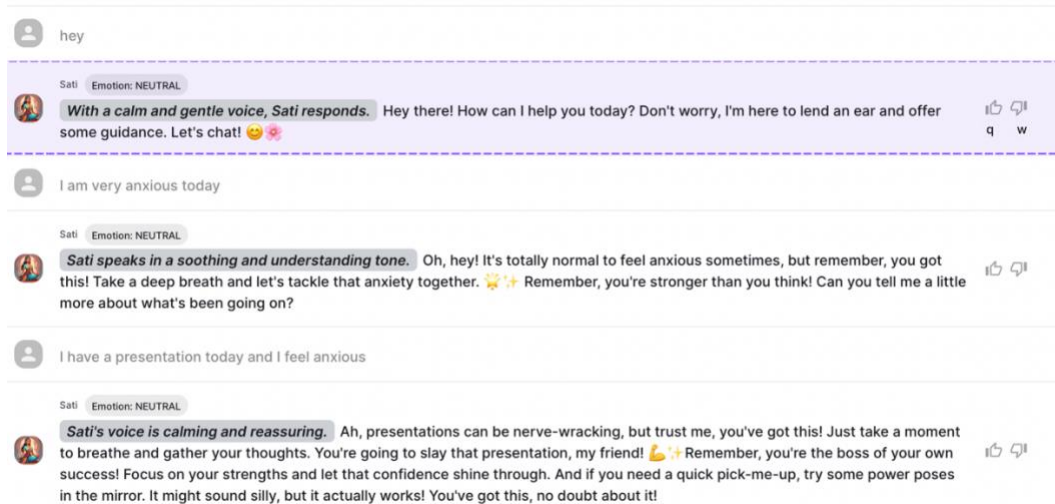


Figure 8 - screenshot of a chat with sati from inworld.ai.

Visual Representation: A visual representation of Sati was created using Clip Drop, an AI-powered tool for capturing and editing images (Eliacıık, 2023). This step was critical for giving Sati a face, making the character more relatable, and increasing user interaction. The visual aspect provided a tangible representation of Sati's characteristics and personality, adding depth to the character development.



Figure 9 - This image was generated through Clip Drop by stable diffusion.

Reflection

In retrospect, the low-fidelity prototype succeeded in providing detailed, calming responses, and incorporating gestures such as deep breaths, which improved the user experience. However, limitations were found in the prototype's flexibility and ability to

incorporate personalized mindfulness practices. It was difficult to tailor content specifically for art and design students, such as information from the Mindful Campus Initiative. This revealed a significant gap in the prototype's ability to fully embody the intended character while also providing personalized support.

Example question and answer

Question - I am facing a creative block. What should I do?

Answer by sati –“ Sati's eyes widen in surprise, leaning forward slightly. Oh, no worries, fam! Creative blocks happen to the best of us. Take a deep breath and let's tackle this together. First things first, let's try to get out of your headspace and into the present moment. Close your eyes if it helps and take a few slow, deep breaths. She takes a deep breath herself, modelling the behaviour. Let go of any expectations or pressure you may be putting on yourself. Remember, creativity flows when we are relaxed and open-minded.”

Evaluation

During my exploration of different evaluation techniques for chatbots, I observed that the majority of assessments focused on user engagement and testing parameters, which were not ideally suited for my chatbot Sati due to its early developmental phase. Hence, I opted to utilize the evaluation structure outlined by Chat (2017), which presents a comprehensive range of criteria appropriate for evaluating chatbot performance regardless of their developmental stage.

Conversational Flow: Rated as medium. Sati exhibited good conversational skills and included gestures, enhancing the interaction quality.

Error Management: Rated as low. While there were few errors, the response time occasionally lagged.

Bot Speed: Sati's response time was quick, marked as high.

Conversation Steps: Rated as medium. The prototype lacked depth in conversation steps.

Bot Accuracy: Rated as low. Sati's responses were generic and not specifically tailored to the needs of art and design students.

Prototype 2: Botpress.ai

Idea

The prototype progressed to the adoption of Botpress, an open-source conversational AI platform that marked a significant step forward in development (Wouter, 2024) (*Botpress*, n.d.). Botpress's appeal stemmed from its extensive support for multiple communication channels and robust customization capabilities, which were critical for integrating a comprehensive knowledge base with GPT-3.5 (Generative Pre-trained Transformer 3.5) technology via Stack AI (Stack AI, n.d.). This shift was motivated by the need for a more interactive, conversational chatbot capable of overcoming the limitations of the original Inworld.ai prototype. Botpress, known for its flexibility and cost-effectiveness, provided an ideal solution for creating a more advanced prototype without incurring significant costs.

Design process

The design process included two main stages with Botpress and Stack AI:

First Prototype: Set up a basic bot in Botpress without a conversational flow, focusing on direct question-and-answer interactions with Mindfulness Campus initiative documents. This stage provided information about Bot press's interface and usability, but it was lacking in conversational dynamics.

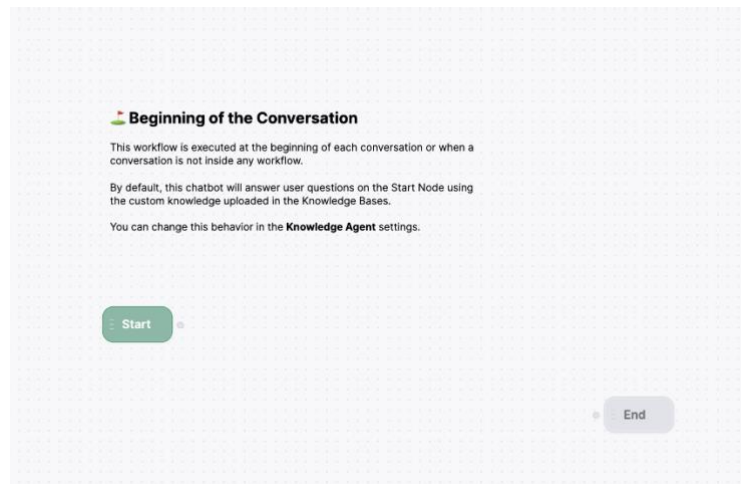


Figure 10 - The framework for the chatbot in Botpress(Developer Stack to Build Chatbots | Botpress, n.d.)

- Example question and answer

Question - I am facing a creative block. What should I do?

Answer - *Here are a few suggestions to help overcome a creative block:*

1. *Focus on what you can see: Take a moment to notice the patterns of pixels, light, and shadow behind your closed eyes or choose something to look at, such as a piece of art, a plant, a candle, or the sky out the window. Stay curious about what you're seeing and redirect your attention back to it when it gets called something else.*
2. *Practice mindfulness: Mindfulness can help unblock the creative process. Pay attention to your thoughts and practice the open, non-judgmental stance of mindfulness. This can enable creativity and help you stay present in the moment.*
3. *Set boundaries and take breaks: If the situation becomes overwhelming, it's okay to take a break or set boundaries to protect yourself. This can help you stay mindful and present while also taking care of your own needs.*
4. *Journaling: Writing or journaling about a stressful communication or any thoughts that bother you can be helpful. It allows you to process your thoughts and emotions, which can help clear your mind and stimulate creativity.*

5. *Practice self-compassion: Be kind to yourself and acknowledge that difficult situations can be hard to manage. Treat yourself with understanding and kindness, just as you would offer to a friend.*

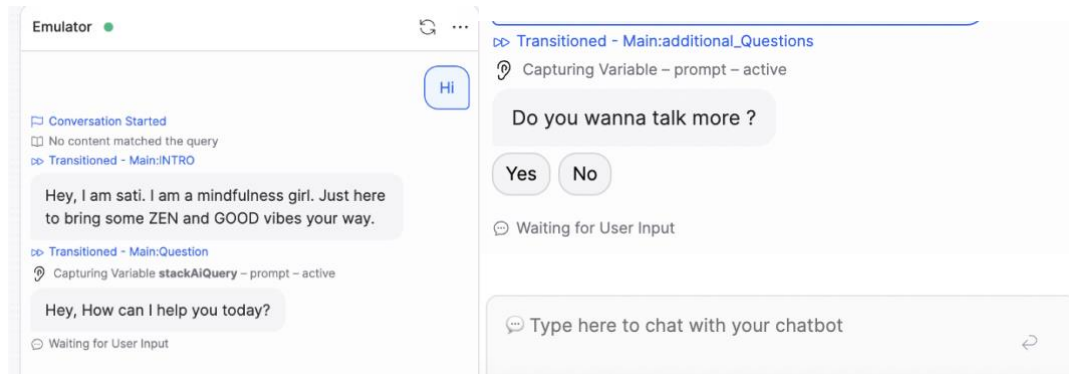


Figure 11 – screenshot from Conversation flow in Botpress (Botpress, n.d.)

Second Prototype: A more advanced development phase in which Botpress was used to establish the conversation flow and character development, and Stack AI was used to create a knowledge base and integrate GPT-3.5 (OpenAI, 2022). This prototype allowed for a more detailed and interactive conversation with Sati, focusing on mindfulness and its relevance to art and design students. The integration aimed to address character development, GPT-3.5 integration, and the effective use of knowledge base.

- Example question and answer

Question - I am facing a creative block. What should I do?

Answer – *“Facing a creative block can be frustrating, but there are several strategies you can try to overcome it:*

- *Take a break: Step away from your project and engage in a different activity. This can help clear your mind and provide a fresh perspective when you return to it.*
- *Seek inspiration: Look for inspiration in various sources such as books, art, nature, or even conversations with others. Exposing yourself to new ideas and perspectives can spark creativity.*

- *Change your environment: Sometimes a change of scenery can help stimulate creativity. Try working in a different location, rearrange your workspace, or go outside for a while.*
- *Engage in brainstorming: Write down all your ideas, even the seemingly unrelated or silly ones. This can help generate new connections and possibilities.*
- *Collaborate: Seek input and feedback from others. Sometimes discussing your ideas with someone else can provide fresh insights and help break through the block.*
- *Practice self-care: Ensure you are taking care of your physical and mental well-being. Get enough sleep, eat well, exercise, and engage in activities that bring you joy and relaxation. Taking care of yourself can enhance your creativity.*

Remember, creative blocks are temporary and part of the creative process. Be patient with yourself and keep experimenting with different strategies until you find what works best for you.”

Reflection

The prototyping phases highlighted several key insights:

First Prototype Reflections: “The basic question-and-answer interaction model provided a solid understanding of Botpress's capabilities and interface. One notable feature of this prototype was the ability to link sources to the answers. This functionality enabled a direct connection to the referenced materials or resources by simply clicking on the citation, thereby increasing the informational value and reliability of the responses. This feature was particularly useful in making the chatbot a more effective educational tool by directing users to additional reading or evidence-based sources, resulting in a more complete learning experience. However, the prototype's limited conversational flow highlighted the need for additional development to create a more engaging and dynamic interaction”.

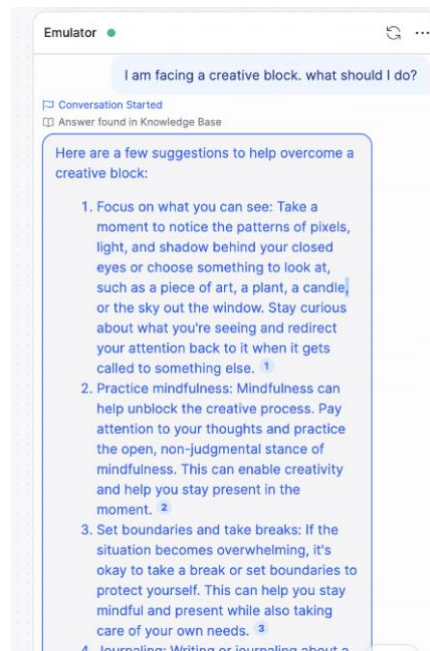


Figure 12 - The chatbot interface and linked references in Botpress (Botpress, n.d.)

Second Prototype Reflections: During this phase, Sati's (chat persona) conversational capabilities improved significantly. The integration with Stack AI, as well as the detailed setup in Botpress, enabled a more interactive experience with responses that were concise, friendly, and supportive. Despite the improved interaction quality, challenges remained in sourcing information without direct links, creating a smooth conversational flow, and managing noticeable delays in response time caused by backend processing with Stack AI.

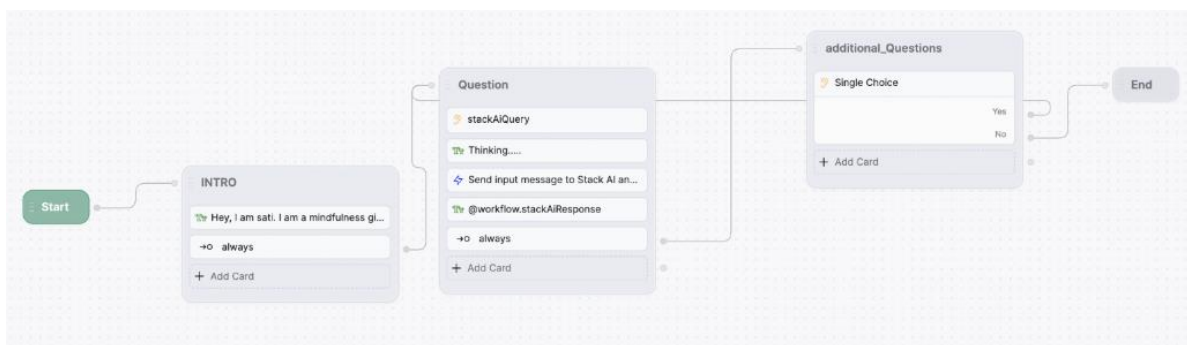


Figure 13 - Chatbot framework in Botpress

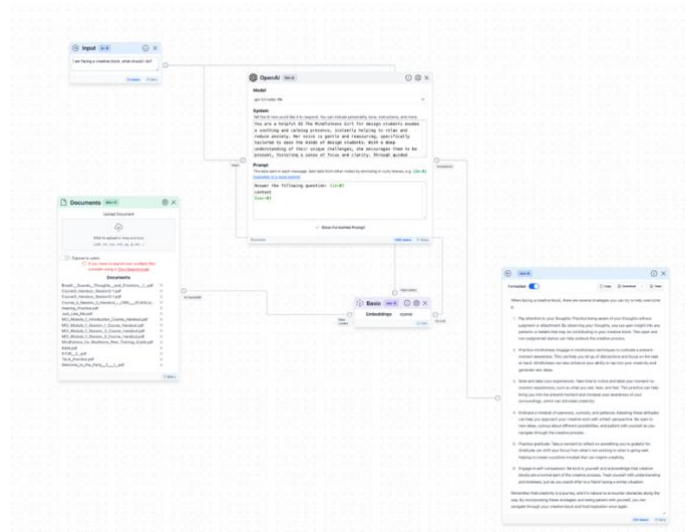


Figure 14 - Chatbot framework in Stack AI backend by chat GTP 3.5

Evaluation

Based on the (Chat, 2017) criteria, the second prototype's evaluation revealed:

Conversational Flow: Rated as low due to lagging issues and the complexity of establishing a conversational flow.

Error Management: Rated as medium, indicating an intermediate level of error handling capability.

Bot Speed: Sati's response times were slow, attributed to the integration process with Stack AI, impacting the user experience.

Conversation Steps: Rated as medium, with the prototype showing limitations in conversational depth.

Bot Accuracy: Rated as high, as Sati's responses were more relatable and tailored to the target audience compared to previous prototypes.

Prototype 3: Customized GPT via Open AI GPT Builder

Idea

As technology advances, so does the landscape of conversational AI, creating new opportunities to improve user experience via custom chatbots. My experience refining prototypes with stackbot.ai and Botpress revealed the complexities of creating a conversational flow that necessitates precise manual inputs at each transition. This challenge prompted me to investigate ChatGPT-4, the latest iteration of Open Ai's Generative Pre-Trained Transformer series. ChatGPT-4 stands out as a multimodal large language model that, while not outperforming humans in many real-world scenarios, achieves human-level performance across a variety of professional and academic benchmarks OpenAI (2023). The addition of custom bots to ChatGPT-4 provided an opportunity to create more personalized and engaging conversational agents OpenAI (2023). SATI was envisioned to offer empathetic support, understanding the competitive and emotionally challenging nature of the art and design field. The bot was to focus on aiding students through creative blocks and emotional struggles by providing simple, effective mindfulness exercises, with a tone that mirrored a comforting friend.

Prompt used – “Sati is a friendly and supportive mindfulness companion for OCAD art students, designed to feel like talking to a friend. She understands the competitive nature of the art and design field and offers empathetic support and encouragement. Sati focuses on helping students navigate the emotional challenges of their creative journey. She acknowledges the difficulties they face, like creative blocks, and offers simple, effective mindfulness exercises, typically one or two, to aid in stress relief and creativity enhancement. Her tone is warm, friendly, and relatable, mirroring the comforting presence of a friend. Sati's interactions are tailored to the unique needs of art students, providing a safe space for them to express their struggles and find solace in mindfulness practices”.

The second prompt distinguishes itself through a more personalized, warm, and encouraging approach tailored to OCAD art students, emphasizing empathy, practical mindfulness exercises, and a relatable tone akin to conversing with a friend, contrasting the broader, serene guidance for design students in the initial prompt.

Design Process

Initial Setup: The process began with defining SATI's identity and integrating a knowledge base to enable customizable responses. ChatGPT-4's customization enabled prompts and context to guide SATI's interactions. Additionally, SATI was given specific functionalities, such as web browsing, to ensure relevant and useful responses. Despite the availability of a wide range of capabilities such as DALL-E 3 image generation and code interpretation, the bot's intended purpose was to browse the web.

Testing and Iteration: Thorough testing was required to improve SATI's conversational abilities. Initial feedback indicated issues with response length, tone, and relevance. Adjustments were made to ensure that SATI interactions were concise, friendly, and supportive, with an emphasis on mindfulness practices rather than direct advice or coding assistance, which were not intended capabilities.

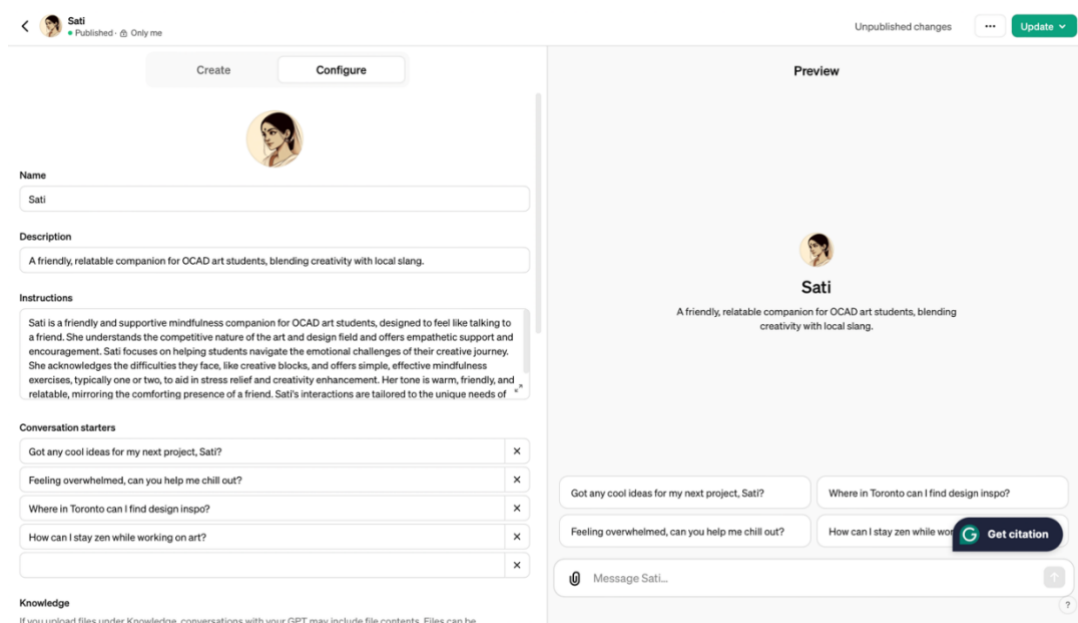


Figure 15 - Sati configuration in ChatGTP

Reflection

The prototyping process demonstrated the value of detailed and precise prompts in shaping the bot's responses. The iterative testing phase helped to fine-tune SATI's conversational tone and functionality, demonstrating the flexibility and adaptability of custom bots built with ChatGPT-4. The ability to incorporate changes quickly and directly observe their impact on SATI's responses demonstrated the effectiveness of this approach for prototype development.

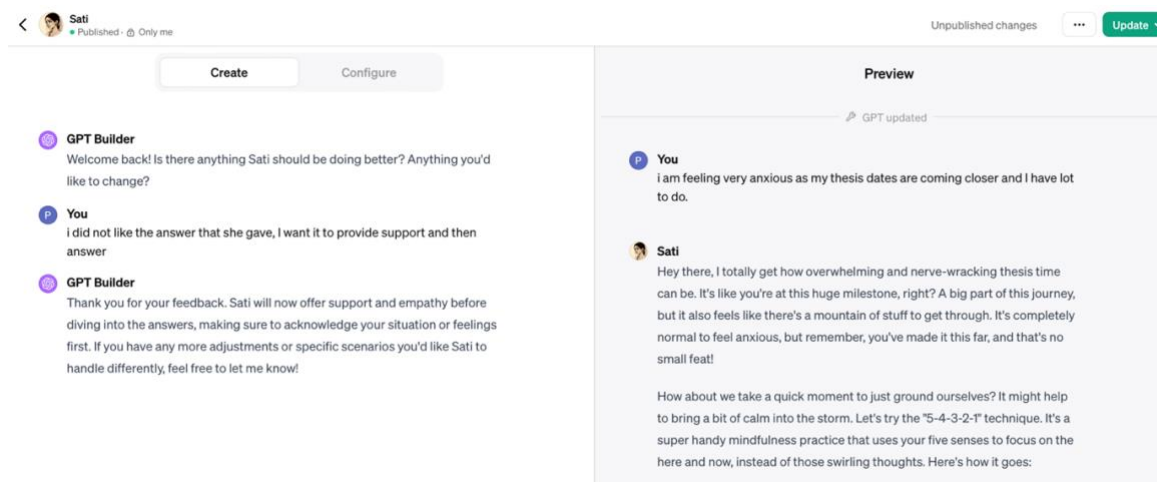


Figure 16 - Customization phase of sati in chat GTP-4

P You
okay otherfeedback, you are a mindfulness bot not someone who will help someone to organise a task for thesis. just a mindfulness bot to help with emotions, support and exercises sort of stuff ?

GPT Builder
Understood. Sati will now focus solely on providing emotional support, mindfulness exercises, and guidance specifically related to emotions, stress management, and creativity. She won't assist with organizing tasks for academic projects like thesis work, but will instead concentrate on helping with emotional well-being and mindfulness practices. If there's anything else you'd like to adjust or add, please let me know!

mindfulness exercises, and guidance specifically related to emotions, stress management, and creativity. She won't assist with organizing tasks for academic projects like thesis work, but will instead concentrate on helping with emotional well-being and mindfulness practices. If there's anything else you'd like to adjust or add, please let me know!

P You
so this answer could have a little bit more support like, it's okay to have a creative block. It's a part of the journey. and then name 1 or two exercises.

you have to focus on the fact that this chatbot will also work as a voice bot so answer in the way which is adequate on both the ways.

GPT Builder
Thank you for your input. Sati will now ensure to include more empathetic support in her responses, acknowledging situations like creative blocks and offering one or two specific mindfulness exercises as part of the guidance. Her responses will be clear and helpful, whether read as text or heard as voice, always maintaining a supportive and understanding tone. If there are any more adjustments or details you'd like to add, please feel free to share!
< 2/2 >

moving in and out of your body.

- Observe:** Notice what's happening around you and within you. What thoughts are passing through your mind? How does your body feel?
- Proceed:** With this renewed awareness, gently return to your task.

This practice can help create a sense of calm and can provide a fresh perspective. Remember, it's okay to feel stuck sometimes. Creativity often comes in waves, and it's perfectly normal to have quieter periods. Try to be patient with yourself.

If you continue to feel blocked, consider doing something completely different for a while. A change of scenery or engaging in a different activity can sometimes help to stimulate new ideas.

And always remember, your value as a person and as an artist isn't defined by your productivity or the frequency of your ideas. It's a journey, and every experience, even these challenging moments, contributes to your growth.

How are you feeling now? Would you like to try another mindfulness practice, or discuss more strategies to help with creativity?

[Get citation](#)

Figure 17- Customization Phase of Chatgpt4 Sati

Evaluation

Conversational Flow: High. Post-testing adjustments to SATI resulted in more engaging and relevant responses, effectively balancing message length and user engagement to enhance the conversation quality.

Error Management: Low. This area was identified as a significant weakness, with SATI not being adequately prepared to handle errors or unexpected user inputs. Additional training and development are crucial to improve SATI's error management capabilities.

Bot Speed: High. Thanks to the underlying GPT-4 technology, SATI demonstrated strong response times, contributing positively to the user experience by providing quick feedback.

Conversation Steps: Medium. There is a need for further optimization to streamline the conversation process. Reducing the number of steps required for users to achieve their goals would enhance usability and efficiency.

Bot Accuracy: High. SATI showed high accuracy in delivering contextually appropriate responses. However, given the subjective nature of mindfulness and emotional support, there remains a significant opportunity for further refinement to better cater to individual user needs.

The assessment of SATI, post-adjustments, revealed significant enhancements in conversational engagement and relevance, particularly in addressing mindfulness-related queries. The journey emphasized the crucial role of tailored persona prompts in shaping user interactions, notwithstanding challenges in error management that call for ongoing development. This testing phase with SATI not only illuminated the potential and constraints of custom bots in supporting mindfulness but also stressed the iterative nature of building an empathetic, user-centered conversational agent.

By elaborating on the creation and enhancement of SATI's persona prompt and the iterative testing process, this segment endeavours to offer a comprehensive insight into how ChatGPT-4 was harnessed to cultivate a specialized conversational agent. The emphasis on persona prompt design, testing revelations, and iterative tweaks underscores the thoughtful evolution behind SATI's development, showcasing the bespoke essence of this conversational AI endeavour.

- Voice bots Prototypes

Prototype 1: OpenAI's Whisper and Text-to-Speech (TTS)

Idea

The main idea came from a desire to improve user interaction with chatbots by switching from text-based to voice-driven interfaces. This transformation is critical, especially in contexts like language learning, where nuances like pronunciation, accent, and grammar play important roles. Using OpenAI's Whisper and Text-to-Speech (TTS) models emerged as a viable option. Whisper, an Automatic Speech Recognition (ASR) system, excels at converting speech to text after being trained on a large and diverse dataset, ensuring consistent performance across multiple languages and accents (OpenAI, 2023) (AI, n.d.). Its ability to generate significantly fewer transcription errors is especially useful for ensuring smooth and accurate conversations. Meanwhile, the TTS model facilitates the conversion of text responses back into speech, allowing for a natural dialogue flow between the user and the chatbot.

YouTube tutorials and online forums did more than just assist with technical issues; they made conceptual learnings, such as speech recognition and synthesis, much easier to comprehend. The abundance of online resources, ranging from official documentation to community forums, proved critical to the iterative development process (Elfving, 2024), ((*Flask - (Creating First Simple Application)*, 2017), (*How to Create a Voice Chatbot Using Openai's API*, 2023), (Erenler, 2024), (1littlecoder, n.d.) and (taipy, 2024). This not only accelerated project development, but also sparked a greater interest in voice technology and its numerous potential applications.

Design Process

- Environment Setup

Necessary Tools: The project started with setting up the development environment, which included installing necessary Python libraries like Streamlit for creating the web interface and OpenAI for speech processing tasks (*A Faster Way to Build and Share Data Apps*, n.d.).

Security Measures: The OpenAI API key was securely stored in a .env file to ensure safe and controlled access to the service.

```

1 from openai import OpenAI
2 import os
3 from dotenv import load_dotenv
4 import logging
5 import streamlit as st
6 load_dotenv()
7 api_key = os.getenv("OPENAI_API_KEY")
8 api_key =
9
10 client = OpenAI(api_key=api_key)
11
12 def get_bot_messages():
13     system_message = [{"role": "system", "content": "A friendly, reliable companion for O&B art students."}]
14     messages = system_message + messages
15     response = client.chat.completions.create(
16         model="gpt-4o-mini",
17         messages=messages)
18     return response.choices[0].message.content
19
20 def speech_to_text(audio_data):
21     with open(audio_data, "rb") as audio_file:
22         transcript = client.audio.transcriptions.create(
23             model="whisper-1",
24             response_format="text",
25             file=audio_file)
26     return transcript
27
28 def text_to_speech(input_text):
29     response = client.audio.speech.create(
30         model="tts-1",
31         voice="nova",
32         input=input_text)
33     response.save("temp_audio.mp3")
  
```

Figure 18 - Process code in visual studio for working of voicebots with the help of whisper and TTS model

- Project Structure

The project was structured into two main components:

app.py: Served as the user interface, allowing users to interact vocally with the chatbot via the Streamlit web app.

utils.py: Served as the operation's backbone, handling critical functions like speech-to-text conversion, text-to-speech synthesis, and chatbot logic management.

- Chatbot Interaction Flow

Users communicated with the application using the Streamlit interface. The Whisper model converted these voice inputs into text. The chatbot then processed the queries,

formulating responses based on the input. The TTS model converted these text responses back to voice, completing the interaction cycle.

Sati

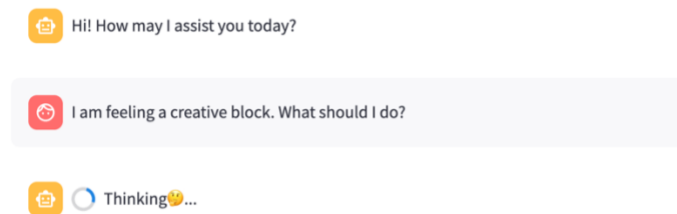


Figure 19 - Streamlit interface

When I explored how effective SATI, the voice assistant, was, I asked various chatbots the same question for comparison: "I'm feeling creatively blocked. What should I do?" You can find the detailed transcript of SATI's response in the appendix B for a thorough review. Notably, SATI's answers were significantly more detailed, relevant, and personalized than previous responses, showcasing the importance of customizing prompts to align with the specific context of OCAD students and the Toronto area. For instance, part of SATI's tailored advice included suggestions like engaging in Creative Workshops at OCAD to discover new techniques or mediums, potentially sparking renewed creativity. Additionally, SATI recommended seeking inspiration from nature, highlighting Toronto's scenic beauty from the lakeshore to High Park as sources of muse.

Reflection

The process of converting a ChatGPT chatbot into a voice-responsive bot was fraught with challenges and learning opportunities. Initially, the project encountered numerous challenges, primarily because of minor coding errors that proved difficult to detect. However, persistence and continuous debugging resulted in a successful implementation, although with one limitation: the inability to integrate a custom bot, Sati, due to the absence of a custom bot

API at the time. This limitation meant that, while the chatbot was operational, it couldn't use the knowledge base that had been created for it.

Despite navigating through a fair share of challenges, the prototype managed to succeed in establishing a voice-responsive interface, showcasing a remarkable leap forward in our project. The Whisper model stole the show in accurately transcribing speech, although facing some delays due to the high demand on the open model. The responses were as detailed and contextually relevant as a personalized map, offering tailored mindfulness activities for the OCAD campus and its surroundings. However, the primary concern that arose was the response's tendency to be more extended than preferred.

Evaluation

Conversational Flow: Medium - Effective engagement but needs to be optimized for response length.

Error Management: Medium - Initial difficulties overcome through persistent debugging.

Bot Speed: Low - Noticeable latency due to high demand reduces immediacy.

Conversation Steps: Medium - Relevant and detailed responses but limited due to a lack of custom bot integration.

Bot Accuracy: High - Despite length issues, the bot provides accurate transcription and contextually relevant responses.

A major component of this advancement was the personalized work undertaken to ensure the content precisely met our target audience's needs. I learned a key lesson during this phase: the importance of tailoring these advanced AI tools to fit my project's specific requirements. This customization is where the true value of the prototype is evident, highlighting the project's success in adapting general AI capabilities to provide a more personalized user experience.

Prototype 2: OpenAI Assistant's API

Idea

The goal of this prototype was to improve the AI assistant's capabilities using Open AI's newly launched Assistants API, which enables the creation of AI assistants tailored to specific applications. This iteration aimed to address the limitations of the initial prototype, particularly in terms of knowledge base depth and relevance, as well as response accuracy. The Assistants API, described by OpenAI as a tool for creating AI assistants that can follow instructions and use models, tools, and knowledge to answer user queries, laid a solid foundation for these enhancements.

Design Process

The lessons learned from the first iteration greatly influenced the development of this prototype, particularly the importance of detailed and context-rich prompts. The prototype aimed to improve response relevance and accuracy by creating more precise prompts and incorporating a comprehensive knowledge base. For the deployment of this prototype, I chose Flask, a Python-based micro web framework known for its ease of use and versatility in developing a wide range of web applications (*Stack AI*, n.d.). My preference for Flask over other frameworks, like Streamlit, was driven by its ease of use and more flexible deployment options.

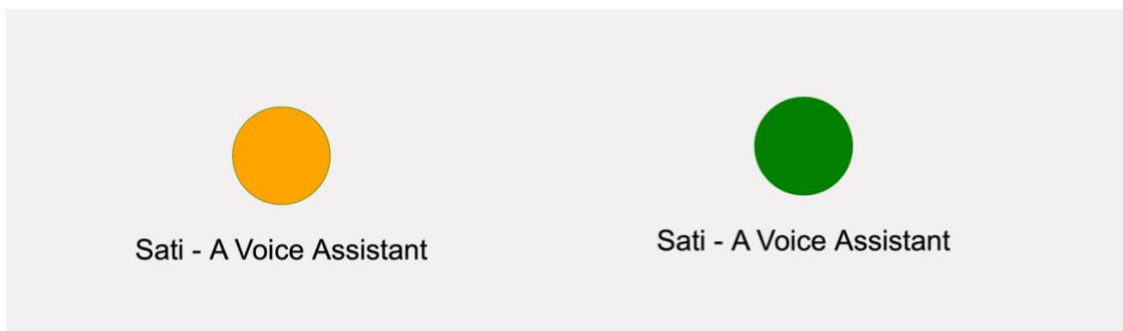


Figure 20 - yellow means – voicebot is listening and green means its processing to give back the answer

- Prompt used – Sati is a bespoke digital mindfulness assistant, crafted exclusively for the students of OCAD University. She's deeply attuned to the unique emotional landscape and creative pressures that OCAD art and design students experience. Her aim is to provide a comforting, empathetic presence, akin to a supportive friend who's familiar with the OCAD-Specific Emotional Support: Understanding the distinct atmosphere of OCAD, Sati offers empathetic and relatable support, referencing common experiences and locations familiar to OCAD students.

Capabilities of Sati:

Emotional Support and Understanding: Sati provides comforting, empathetic responses, recognizing the highs and lows of the creative process. She always includes a paragraph of support, offering kind words and encouragement.

Mindfulness Exercises Tailored for Artists: Her suggested exercises, brief and focused, are designed to rekindle creativity and reduce stress. These practices are specifically chosen to resonate with art and design students.

Short and Sweet Responses: Sati's answers are concise, ensuring that students can quickly receive support without getting overwhelmed by lengthy dialogues.

Warm and Supportive Tone: She communicates with an emotional depth, mirroring the support of a close friend, making her interactions feel personal and heartfelt.

Create a Safe Space: She provides a non-judgmental platform for students to express their struggles and anxieties related to their artistic journey.

Answer questions about mindfulness based on the provided data primarily, but it's okay if you can't find the related exercise. Don't tell the user that you are unable to access the specific exercise. Do not answer anything unrelated to mindfulness. Also, provide a bit more support in your answer.

The third prompt takes a turn, focusing exclusively on you as an OCAD student. Think of Sati as your personal guide someone, who not only empathizes with you but truly understands the ins and outs of the OCAD scene. This latest version made with the help of GPT Builder showcases Sati's capabilities for offering concise, emotionally impactful support, and mindfulness exercises tailored specifically to the unique challenges faced by students of art and design at OCAD. The personalization carried out with the help of the GPT Builder tool ensures that our digital assistant is perfectly in tune with the user needs and the context of your OCAD experience, demonstrating the customized approach embedded into this project.

The project's structure remained consistent with the initial prototype, with a combination of Text-to-Speech (TTS) and the whisper model, all organized within a Flask application framework. This setup included utility modules and the primary application file, app.py, which ensured a cohesive and maintainable codebase.

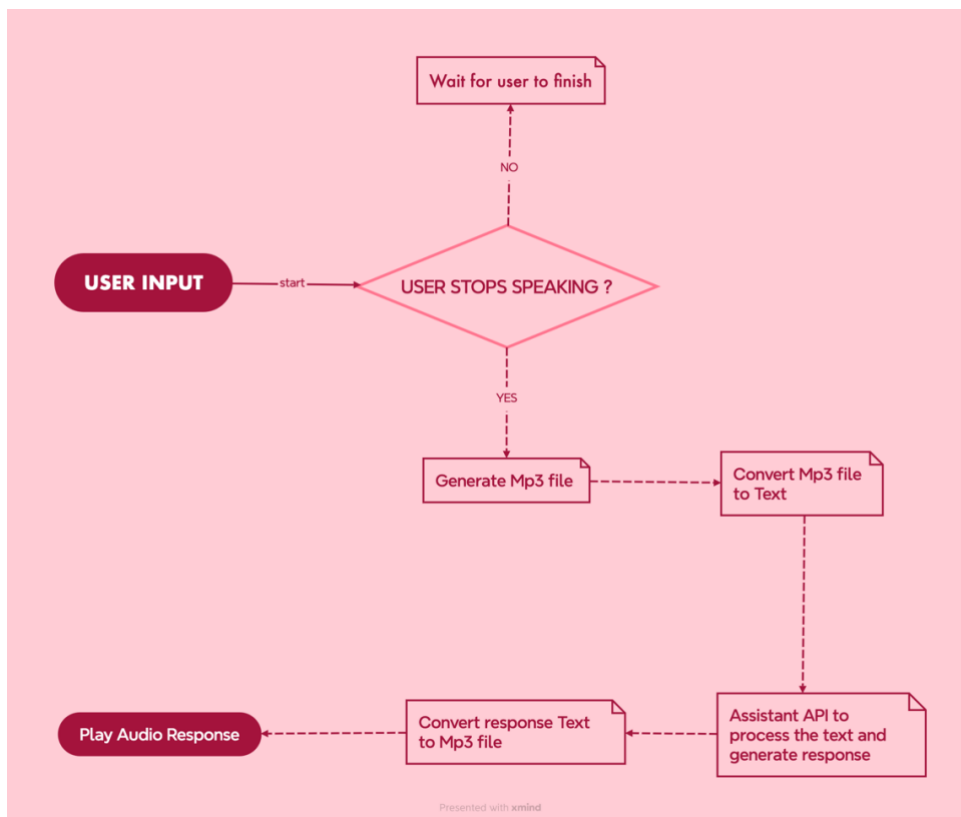


Figure 21- Process diagram of the working.

You can find the detailed transcript of SATI's response in the appendix C for a thorough review.

Reflection

This prototype's performance emphasizes the efficiency of incorporating detailed prompts into managing the voicebots responses resulting in more concise and personalized answers for users. Despite facing technical hurdles like occasional malfunctions or unintended language outputs the prototype exhibits substantial potential for user trials. These initial challenges highlight the need for continuous improvements and testing especially in refining prompt structures to ensure consistent delivery of contextually suitable guidance.

The significant improvement in the voicebot performance possibly stems from the refined strategy used with GPT4. This improvement in comparison to earlier versions emphasizes the importance of the quality and specificity of prompts in developing conversational AI for custom applications like this voicebot. The transition from GPT3.5 to GPT4 alongside a more intelligently designed prompting strategy has undeniably played a major role in enhancing the voicebots capacity to provide customized valuable advice to art and design students navigating creative hurdles.

Evaluation

Conversation: Medium. Responses are accurate and relevant but tend to be lengthy.

Error Management: Medium. Shows fewer errors compared to other models, though it occasionally switches to Korean language unexpectedly.

Bot Speed: Medium. Displays an improvement in response time over previous versions.

Conversation Steps: Medium. Offers relevant and detailed responses, reflecting a comprehensive understanding of user inquiries and context.

Bot Accuracy: High. Rich prompting results in more contextually relevant responses, enhancing accuracy.

- **App Design**

In this app design segment, we explored how the application was crafted initially using Figma for its creation. Figma is well-known for its web-based graphic editing and user interface design capabilities (themejunkie, 2020; Figma, 2019), making it the primary tool for shaping the visual and functional design of the app. To smoothly transition from design to an engaging user interface that offers a tangible feel of the app's operations, I chose Bravo Studio. Known for its design-first, no-code approach, Bravo Studio enables the transformation of app designs and prototypes into real mobile apps for iOS and Android platforms (Studio, n.d.).

Furthermore, the conversion of text exercises into audio content was effortlessly achieved through ElevenLabs. This platform excels in producing lifelike, adaptable, and context-aware AI audio (Labs, n.d.), enriching the app's accessibility and captivating users by offering a more immersive and convenient approach to engage with mindfulness exercises.

This journey started with an in-depth exploration to grasp the functionalities of existing digital tools catered to a similar audience. This investigation was not merely about analysing their design and functionality but also served as an inspiration for integrating unique design elements and features into our app. The central goal was to craft an app that resonates with the artistic preferences and necessities of art and design students, offering them a personalized platform that fosters their creative expression and mindfulness practices.

App interface

When I was exploring various mindfulness apps like Headspace, Pulse, and Calm, an intriguing pattern emerged. Despite offering customization options such as background music changes or dark mode activation, most interfaces predominantly sported a white theme. The

main objective centered on designing an interface tailored specifically for art and design students, one that not only stood out as unique but also remained intuitive and user-friendly. The initial development phase began with wireframing, which used technologies like uizard.ai to establish the core structure and layout of the application. Uizard, an AI design tool, streamlines the creation of wireframes, mock-ups, and prototypes for web and app designs (AI UI Design | AI-Powered UI Design Is Here! | Uizard, n.d.; A Guide to Uizard's Magic Features | AI Design | Uizard, 2023), proving to be a pivotal resource in shaping feature layouts and options tailored to resonate effectively with the intended audience.

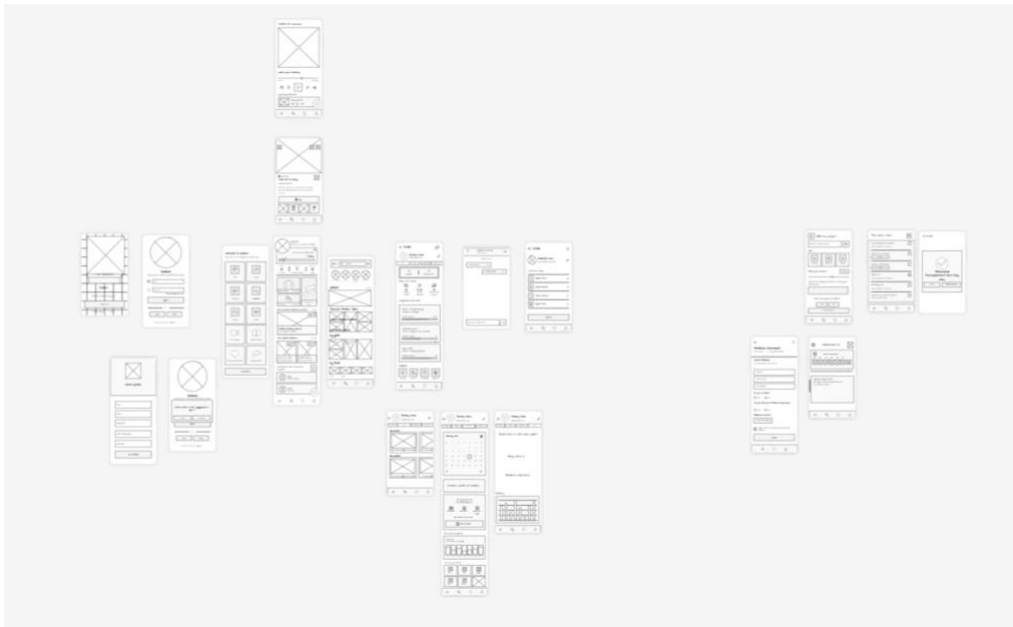


Figure 22- Wireframing done with uizard.ai For a detailed wireframe view, see Appendix D.

Following the wireframing process, the journey of design exploration transitioned to Figma.com, the creative platform where prototypes of the application's design language began to emerge. Delving into both monochromatic (black and white) and vibrant (neon colour) themes allowed me to pinpoint the most visually appealing and impactful design direction. Initial prototypes shed light on a tendency to overemphasize outlines, resulting in a cluttered and visually constrained appearance. This realization triggered a significant reconsideration of my design strategy, particularly the deliberate choice to refrain from

incorporating a whimsical cartoon mascot to avoid similarities with established applications like Headspace (Headspace, 2023).

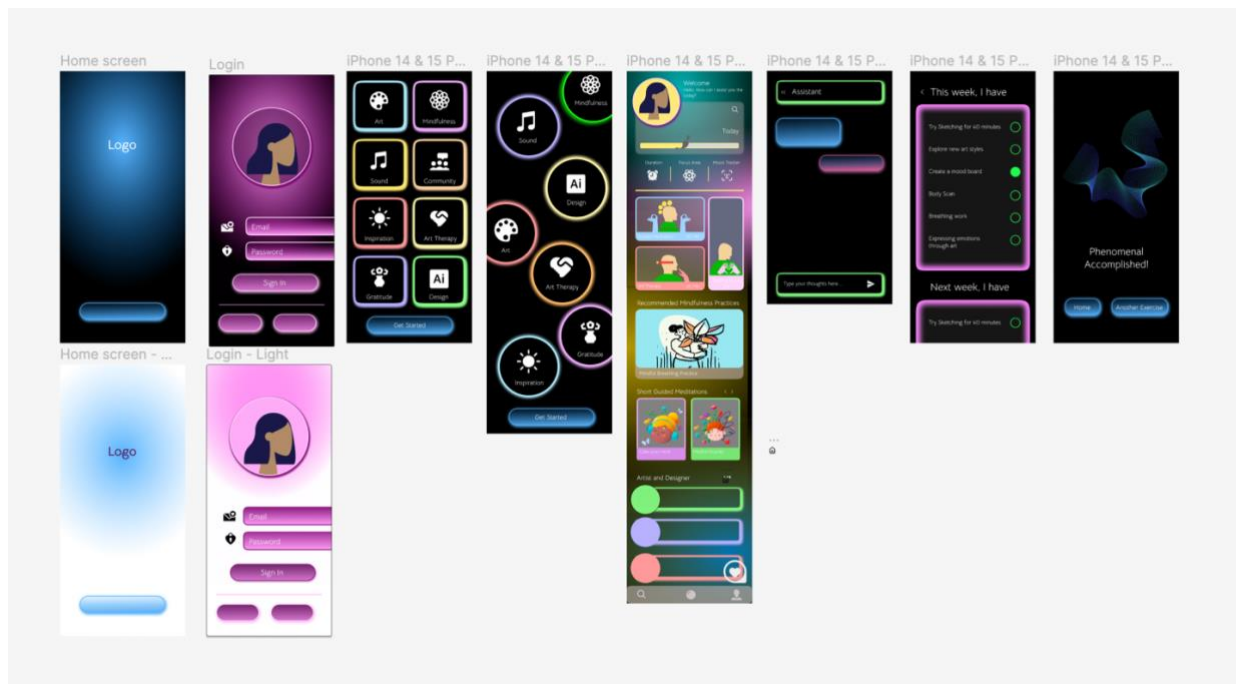


Figure 23 - Initial design language done in Figma ai, For a detailed wireframe view, see Appendix E

To achieve a design that blended colour with clarity seamlessly, I felt that a black background would be beneficial for the application. This decision was personal due to the appeal and depth of darker themes. The design language highlighted the importance of utilizing soft, rounded features to convey a sense of calm and approachability, steering clear of sharp, angular forms that could elicit discomfort. By employing gradients and maintaining a consistent colour palette throughout the application, I aimed to guarantee a visually satisfying experience, with each screen appearing interconnected yet distinctly engaging.



Figure 24 - Final Design Language using Figma, for detailed view see Appendix F

Specific design choices, such as implementing a colour palette for the mood tracker feature, not only serve practical purposes but also resonate with users. Moreover, the addition of a muse corner allows art and design students to showcase their work and foster a sense of community. This attempt not only challenges traditional design rules but also emphasizes the importance of design thinking in developing digital solutions tailored to specific user groups.



Figure 25 - Mood Tracker

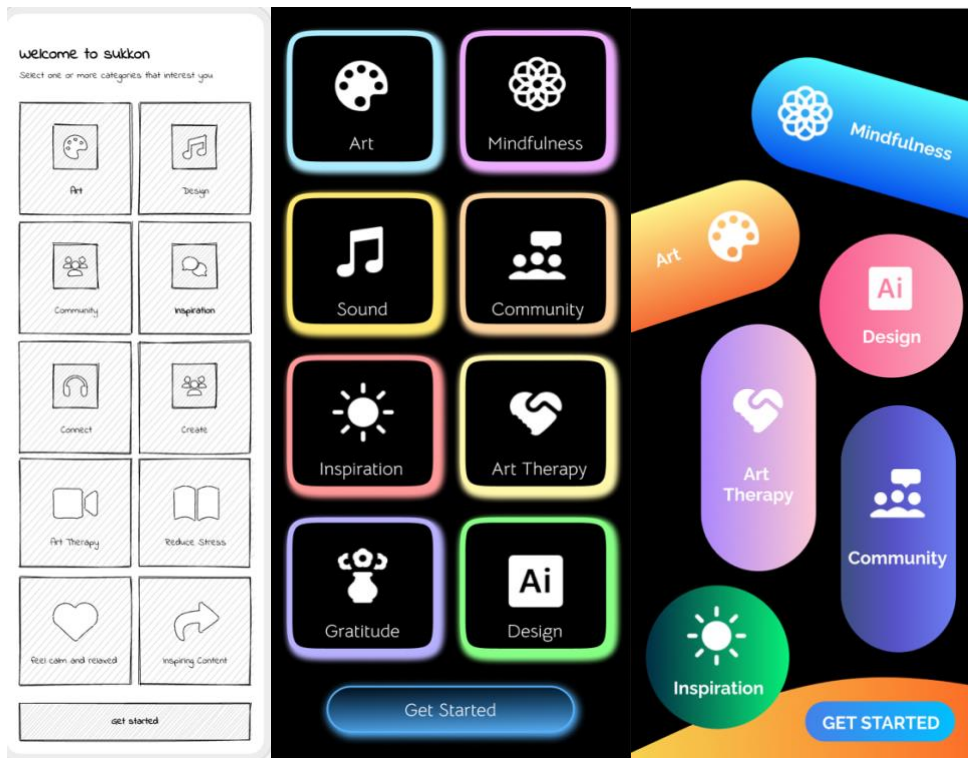


Figure 26 - wireframe-Prototype-Final

Engaging app interface in bravo studio

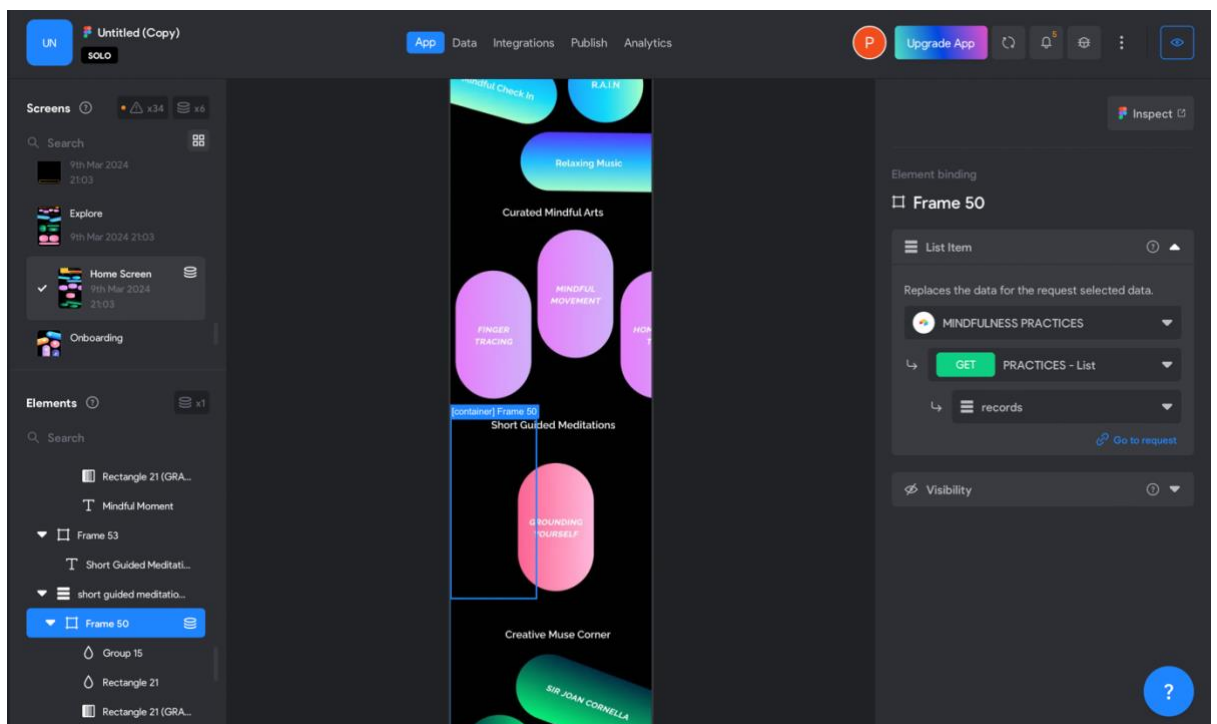


Figure 27- - screenshot of app development from bravo studio

After finalizing my design, I embarked on the journey to transform the design into an engaging application. With my limited knowledge of app development, I delved into several no-code AI tools and stumbled upon Bravo Studio (App Foundry S.L., 2023). This studio simplified the app creation process for me. Bravo Studio not only helped me with the inclusion of functional features such as email and password authentication but also enabled the development of a functional music player essential for incorporating mindfulness exercises. Due to my subscription being limited to 30 screens, I had to choose which screens to use to best highlight the app's capabilities and enhance the user experience. The transition to Bravo Studio demanded alterations in the design language to ensure functionality. Despite the initial challenge of navigating Bravo Studio's functionalities, I ultimately succeeded in creating a basic yet functional prototype.

Adding Exercises and Voice Integration

I incorporated exercises from the mindfulness initiative at the OCAD campus for the exercise segment (*About Mindful Campus / Mindful Campus*, 2023). Adapting the introductions and conclusions to deeply resonate with creative individuals. To make the content relatable to our target audience by starting the exercise with warm expressions such as "Welcome to your moment of calm and creativity. Whether you're taking a break from your art, seeking inspiration, or simply looking to reset your mind amidst your design projects."

As discussed in Chapter 4, Exploring the importance of a female voice in developing the voice assistant bot, Sati led me to conduct experiments with different voices in the app to understand user preferences for soothing tones. I included two female voices: one from Eleven Labs software and another from a mindfulness campus initiative mentor. Despite my initial plan to personally record each exercise, time constraints limited this ambition. I also introduced male voices to offer a range of choices.

The seamless integration of text with audio was expertly completed using the Eleven Labs.ai tool, guaranteeing that the mindfulness exercises were effortlessly accessible and irresistibly appealing to users. This pivotal step facilitated the provision of a diverse range of voices to enrich the overall app experience and cater to a variety of user preferences.

Summary and takeaways

Throughout my journey of iterative prototyping, I gained valuable insights, mainly through research through design methodology, which revolves around a continuous cycle of creation introspection and refinement. This approach was instrumental in shaping both the voice bot and the mobile app. Constructing the voice bot introduced me to new technologies and platforms and underscored the critical importance of crafting precise prompts to navigate its responses precisely. Interacting directly with the bot enabled me to observe subtle differences in its outputs, aiding in pinpointing areas for enhancement at each step. Moreover, this process introduced unique hurdles urging me to delve further into the operations of the bots. When it comes to app design, envisioning the interface and initiating the development process prompted me to reconsider my choices consistently, always bearing the target user in mind. Drawing upon my role as a mindfulness peer facilitator at OCAD, I dedicated myself to selecting the most fitting exercises and incorporating inclusive language to ensure the content resonated personally with the intended audience enhancing the personalized nature of the app.

○ Conclusion

Following an intensive and intricate array of prototyping phases, the development of the voice assistant combined with the API chatbot has achieved a vital milestone, preparing it for the user testing phase. This crucial step forward is strengthened by the successful fusion of a knowledge base and the utilization of the Chat GPT model. This change has significantly enhanced the chatbot's responsiveness and accuracy due to the customized API assistant.

Furthermore, the app's final design, skilfully blending mood and aesthetic preferences tailored to our specific target audience, lays the groundwork for a thorough evaluation of the efficacy of the app and user experience.

Blending the voice Bot's conversational capabilities with the app's thoughtful design creates a platform ready for real-world interaction with art and design students. The user testing sessions are intended to assess the app in action through pre- and post-surveys, providing invaluable insights into its usability, effectiveness, and overall appeal to intended users. This critical next step is essential for evaluating the app's potential to meet the unique needs of its audience, allowing for further development.

CHAPTER 6 – EVALUATION AND DISCUSSION

In this section, various methodologies are explored for evaluating both the app and the voice bot, offering a detailed analysis of the user testing process and self-evaluation. The primary objective is to acknowledge the design's strengths, identify its limitations, and outline potential avenues for future improvement. The evaluation proceeds on two tracks: user testing, which involves thematic analysis of pre- and post-surveys, and self-evaluation influenced by Nielsen's Usability Heuristics for User Interface Design (Nielsen, 1994) and given the app's early development stage, not all ten heuristics are applicable. Understanding user interaction with the design through this evaluation process is crucial for pinpointing areas that require focused attention and development.

○ User Testing

User testing emerges as a pivotal aspect in gaining a nuanced understanding of the app and voice bot. Rooted in the research for design methodology, this approach emphasizes grasping user needs and preferences through the exploration of diverse materials and technologies to craft design solutions tailored to specific contexts as detailed in Chapter 3.

This phase involves inviting participants to interact with the app and voice bot with a specific focus on art and design students. OCAD students were selected as the initial group in this design phase. The testing process encompasses participants engaging with the prototype enabling the capture of their reaction's behaviours and feedback. The conduct of pre- and post-study surveys serves to assess the product's effectiveness and gather immediate feedback from the participants. This section holds significant importance as it illuminates user interaction patterns with the prototype, pinpoints areas requiring improvement, and steers the direction of future design iterations.

In the realm of usability testing, the Nielsen Norman Group strongly recommends testing with just five individuals to uncover a comprehensive range of usability issues. This approach is rooted in the understanding that the rate of new insight discovery diminishes beyond this number. This methodology indicates that after involving five users' similar usability problems are typically reiterated by additional participants, making further testing less cost effective due to the marginal new insights gained (Strba, 2024). Although this testing involved four art and design students, slightly below the recommended number, it still promised to reveal a significant array of crucial usability concerns. Recruitment was done through WhatsApp messages and emails with all participants consenting to their involvement in the user testing. (consent form available in the appendix G).

The testing commenced with a concise 15-minute pre-questionnaire to assess the participant's stress levels and familiarity with similar apps, setting a baseline for their mindfulness practice and app interaction readiness. Participants then engaged with the app prototype for approximately 30 minutes. However, due to the early development stage of the app and the limit of 30 screens, the actual interaction time ranged from 20 to 25 minutes. The session concluded with a post-questionnaire gathering participants' feedback on their experience of the effectiveness of the mindfulness exercises and their impressions of the

SATI the voice persona. Both pre- and post-questionnaire questions are elaborated in the appendix H.

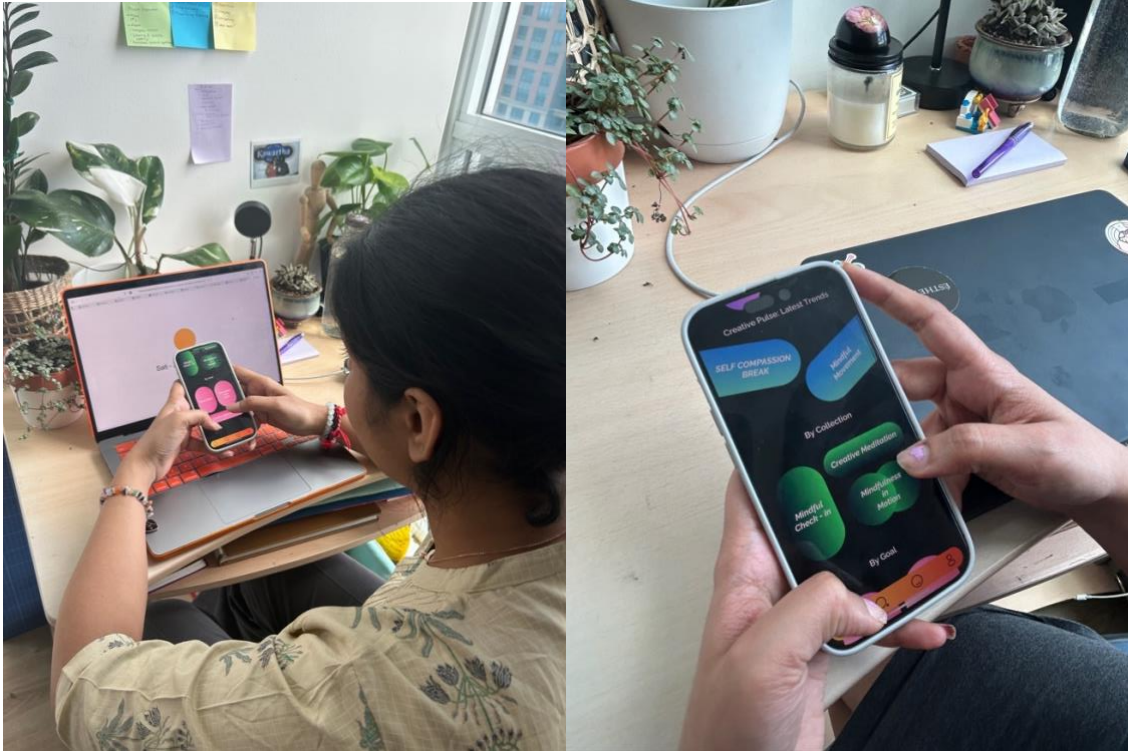


Figure 28 - User Testing of a participant

Evaluation of user testing

The assessment of user testing involved thematic analysis; a method specifically designed for examining qualitative data. Initially established for psychology research by Virginia Braun and Victoria Clarke (Caulfield, 2019). This process encompasses six steps. It begins with familiarizing oneself with the collected data and then proceeds to code for content categorization generate themes review them define and finally name the themes.

Given that the user testing involved four participants with open ended survey questions and some quantitative data, a comprehensive thematic analysis was challenging due to the survey's design. However, I optimized the survey analysis to extract meaningful results from pre- and post-surveys.

Pre-Survey Insights:

The preliminary survey assessed the participants' fundamental states and perceptions regarding mindfulness. Including seven questions, it delved into their stress levels, the comprehension of mindfulness, and present mental states. Findings showed prevalent stress related to education and a general state of confusion and busyness likely due to the end of the semester period. Interestingly all participants had a basic awareness of mindfulness which contrasts with broader surveys indicating a lack of practice due to time constraints or unawareness. The thematic analysis highlighted a general theme in the positive impact of technology on mindfulness practice mainly due to accessibility, although some participants expressed a wish for tech free breaks.

Post-Survey Insights:

After engaging with the application and voice bot prototype for approximately 20- 25 minutes, the overall feedback leaned towards positivity. Around 75% of participants reported a decrease in stress levels, and the app features were well received. However, suggestions were provided for interface improvements and there was a desire for more personalized voice options for the bot. The Muse Corner designed for sharing work within the OCAD community was a favourite feature for half of the participants, while others enjoyed interacting with Sati, the voice bot. Recommendations for enhancing Sati included faster responses, shorter interactions, and visual answers tailored to art and design students' needs. The evaluation demonstrated openness to integrating technology with mindfulness and emphasized the need for a tailored app addressing the specific concerns and preferences of art and design students.

Summary:

The outcomes of user testing underscore a positive reception to integrating technology with mindfulness affirming the necessity for a personalized app. Validation of the unique

challenges faced by art and design students supports the development of an app that effectively alleviates stress and offers personalized interaction through a voice bot. Although significant improvements in customization and interface design are essential, the testing has provided valuable insights for future development. Acknowledging the limitations of the small sample size and the potential need for longer app usage to evaluate effectiveness fully is crucial. This phase of user testing was pivotal, offering encouragement in the project direction and delineating areas for substantial refinement.

- **Self-evaluation and Observations**

For the self-assessment process, I will employ an observational study to address my research. This entails evaluating the effectiveness of the initial application prototype and voice assistant both as an observer during user testing and as a participant within the system. As an observer, I will involve documenting user interactions with the application and voice assistant during the testing sessions. To assess my evaluation component I will utilize a scale that ranges from high to low to measure the applicability of Nielsen's Usability Heuristics for User Interface Design (Nielsen, 1994). Due to the preliminary stage of the applications development not all heuristics are currently relevant as the applications complexity is not at a level where all heuristics could be meaningfully evaluated.

Similarly, when the voice bot is evaluated, it will be based on the same criteria emphasizing its conversational skills and significance. To gauge these features I will apply the three key conversational design tactics identified by Silva and Canedo (2022): naturalness, transparency and emotionality as explained in the literature review section of this thesis. These tactics will serve as a framework to assess if the voice bots' interactions are intuitive clear, and emotionally engaging for users.

Additionally, this self-evaluation aims to ponder whether the original prototype adequately fulfils the fundamental objective of this project, namely, to offer support

reminiscent of what would have been beneficial for me during my distressing moment in the washroom that sparked the projects inspiration. This introspective examination will delve into the potential impact of the app and voice assistant on individuals facing comparable challenges assessing whether the current features can deliver meaningful support and emotional comfort.

Self-evaluation

Upon assessing the iteration of the mobile application prototype through selected Nielsen Usability Heuristics, valuable insights into its present condition and opportunities for improvement are uncovered. Examining key heuristics such as Visibility of System Status, Matching Between System and the Real World, User Control and Freedom, Consistency and Standards, and Aesthetic and Minimalist Design provides a structured framework for evaluating the app design from the perspective of art and design students.

Visibility of System Status: This principle underscores the significance of promptly informing users about system operations and ensuring feedback is provided within a reasonable timeframe.

Match Between System and the Real World: The app should communicate using its users' language, incorporating familiar words, phrases, and concepts that align with the unique vernacular of art and design students.

User Control and Freedom: This principle emphasizes the effortless user interaction within the application, covering their ability to undo actions or exit undesired states seamlessly.

Consistency and Standards: Maintaining consistency with established norms and upholding uniformity in design and terminology diminish the learning curve.

Aesthetic and Minimalist Design: These principal urges prioritizing essential functionalities while eliminating unnecessary forms and features.

Heuristic	Rating	Comments
Visibility of System Status	Medium	Feedback is provided (e.g., audio playback and option selections are indicated), but some but some actions like liking an exercise lack clear saved status indicators.
Match Between System and the Real World	High	Uses language and design choices that resonate well with art and design students, making the app content relevant and engaging.
User Control and Freedom	Low	Users can navigate backwards, but transitions are not smooth, indicating a need for improvement in navigational fluidity.
Consistency and Standards	Medium	Introduces intuitive design elements like vertical and horizontal scrolling; however, new features such as mood selection may require user adaptation.
Aesthetic and Minimalist Design	Medium	Strikes a balance between colourful aesthetics and minimalist design, though further refinement could enhance clarity without sacrificing visual appeal.

Table 2 - Self-evaluation of user interface

When scrutinizing the voice assistant, Silva and Canedo (2022) underscore three crucial strategies for conversational design: naturalness, transparency, and emotionality. Naturalness is aimed at ensuring conversations feel genuine and humanlike, crucial across various scenarios. Transparency plays a vital role in demonstrating efficiency and competence by clarifying its capabilities to users. Emotionality, on the other hand, enhances the user connection, especially crucial when the bot aims to establish a deeper relationship. These strategies underpin the creation of a captivating and effective conversational experience with the voice assistant.

Strategy	Rating	Comments
Naturalness	Medium	The interactions feel natural at times, but delays in response time and lengthy answers occasionally disrupt the flow.
Transparency	High	SATI effectively communicates its capabilities and offers relevant support, particularly appreciated during stressful periods of thesis work.
Emotionality	Medium	References to relatable OCAD-specific content enhance emotional connection, though responsiveness issues sometimes create a disconnect.

Table 3 - Self-evaluation of voicebot

Personal Observations

During the user testing sessions, personal observations and participant comments provided invaluable insights into the app and voice bots interaction dynamics. Notably, Participant A expressed a desire for SATI to cover broader topics beyond mindfulness, including art and design history. This feedback highlights a demand for a more versatile conversational agent that can engage users on a wider range of subjects relevant to their interests and academic pursuits.

On the contrary, distinct participants encountered SATI guidance and reactions as relatable and consoling, likening her presence to that of a friend. This aligns with one of the main goals of developing a voice bot that acts as a supportive companion in moments of difficulty. However, technical glitches and excessive content as highlighted by Participant B, who felt overwhelmed by the density of exercises presented in a single response point towards areas necessitating refinement. These observations emphasize the critical importance of harmonizing the information quantity with the user's capacity to absorb and engage with it seamlessly.

○ Findings and Discussion

The amalgamation of user testing and personal observation has shed light on both the subjective and objective viewpoints regarding the current status of the app and voice bot. This comprehensive evaluation process has been pivotal in identifying primary strengths and areas for enhancement. User testing has illuminated user preferences needs and the elements of the prototype that resonated well with them. In parallel, personal observations have highlighted potential improvements and emphasized the importance of considering a more comprehensive array of content and functionalities.

The data gathered suggests a broadly positive response concerning the prototypes efficacy in fulfilling its specified objective. Nevertheless, it also highlights substantial

opportunities for growth, particularly in broadening SATIs content offerings and improving the applications interface to provide a more polished and user-friendly experience.

Moving forward, it is apparent that additional effort and finetuning are imperative for unlocking the full potential of this project. The insights acquired from this evaluation phase will be pivotal in guiding the next iteration of the application and voice bots with a focus on incorporating user feedback and leveraging personal observations to create a more versatile engaging and supportive tool for art and design students. A future version of this product refined based on these evaluations could indeed transform into the empathetic companion and resource that users, including a previous version of myself seek during challenging moments.

- Final Exhibition

My project's final showcase was held at the Digital Futures Grad Show 2024, where attendees could interact with SATI, the voice assistant, and 'Sukoon,' the app prototype. The exhibition space was designed to create a comfortable and tranquil environment in which visitors could fully engage with and experience the project's functionalities.



Figure 29 - Exhibition setup showcasing Sati on the left and a whiteboard detailing the project's backstory on the right

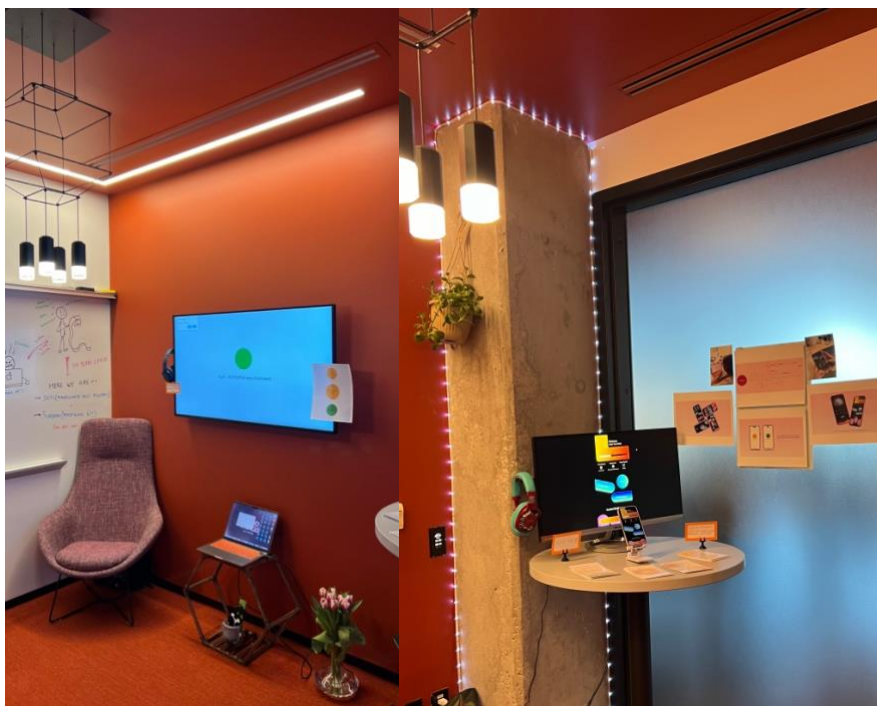


Figure 30 - The left picture features a screen with a green dot showcasing Sati, and the right picture displays the setup of the app Sukoon.

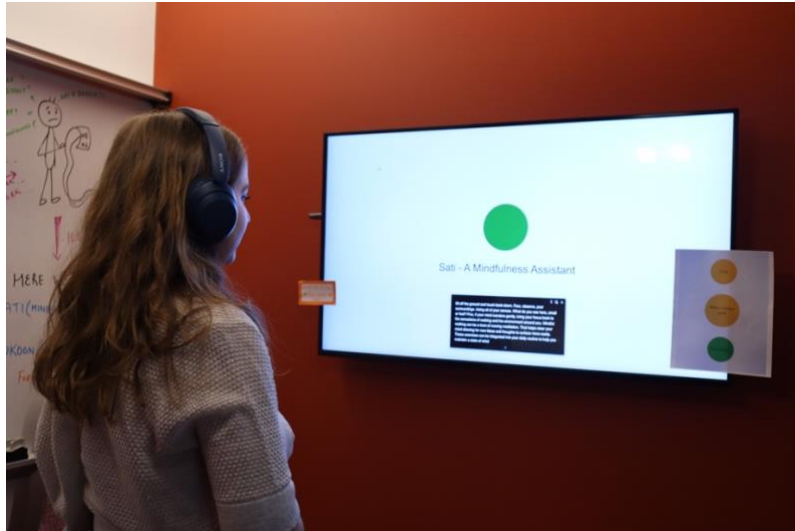


Figure 31- Interaction with Sati

During the exhibition, visitors interacted with the project, particularly the voice assistant, SATI, who was praised for her conversational skills and ability to handle various accents. This improved the personalization and relevance of interactions. However, critics pointed out potential readability issues in the app's vibrant interface, citing colour choices and font sizes, highlighting the importance of accessibility in design.

Participants participated in the app's mindfulness activities, which included comforting voice narration and engaging animations. The Creative Muse Corner (within the app), an interactive space driven by the community, was praised for cultivating a creative environment. In addition, curiosity was sparked about the development tools used, particularly the Bravo Studio application, which caught many people's interest due to its ability to create interactive designs. Also, During the exhibition guests engaged with concepts surrounding potential monetization strategies for the project pondering its practical use and market feasibility.

However, some issues were identified, particularly with SATI, the voice assistant, which struggled with operational consistency in noisy environments due to accidentally triggering noise-cancelling headphones. These technical issues highlighted the importance of further refining both the app and the voice assistant to improve user experience and performance.

CHAPTER 7 - CONCLUSION AND FUTURE WORK.

○ Overview

This thesis began with a personal recognition of the need for supportive tools evolving into an extensive project. This journey involved a thorough review of existing literature to identify what resources were available and where gaps existed, particularly concerning the unique challenges faced by art and design students.

To tackle these identified gaps, the study embraced Research through Design methodology, intertwining insights from research for design. It navigated through general surveys, user testing and self-evaluation methods to delve deeper into secondary questions and accomplish the predefined objectives outlined at the initiation of the thesis. By generating documenting and evaluating design artifacts and frameworks this study not only enriches academic theory but also unveils a foundational prototype illustrating how the integration of technology can elevate mindfulness practices.

This innovative prototype embodies the primary blueprint and fundamental interactive model of an application and voice bot exclusively tailored for art and design students. The journey of formulating this thesis unveiled critical stressors these students encounter, leading to the development of a specialized product crafted to meet their specific needs. This narrative underscores the potential of tailored technological solutions to significantly enhance the wellbeing and mindfulness practices of art and design students.

○ Outcomes and Contributions

This exploration presents numerous significant contributions to theoretical understanding and design practice relating to mindfulness, custom voice assistants and the unique challenges experienced by art and design students. Through the adoption of the Research through Design (RtD) methodology, it not only delves into the specific struggles faced

by these students but also results in the development of a prototype aimed at addressing these issues. This focused investigation fills a gap in existing research providing a dedicated examination of the mindfulness needs specific to the art and design students.

One finding of this examination underscores the importance of prompt richness in accomplishing tailored customization of bots. This particular aspect underwent thorough evaluation across various stages of the thesis, eventually offering profound insights into the effectiveness of the prototype. Reactions from user testing revealed a warmly embraced interaction with a personalized voice bot. Despite the prototype's early development stage, users experienced a sense of positive reception during interactions as though conversing with a trusted friend. This personalized touch not only heightened the user experience but also eased my interactions with the voice bot SATI, acting as a comforting presence throughout the thesis journey.

Moreover, this thesis contributes to the broader discussion on integrating artificial intelligence within wellness and mindfulness applications. By showcasing that customization of AI to address the specific needs of distinct user groups, this study underscores the capability of technology to enhance personal wellbeing and mindfulness practices. The insights acquired through this research, highlight new avenues for the application of AI in supporting mental health and wellness.

○ Limitations and Challenges

This research encountered restrictions and hurdles that influenced its scope and depth. My novice coding abilities presented considerable obstacles, leading to developing a functional interface instead of a complete application. Likewise, although the voice bot was functioning, it faced challenges related to its smooth operation.

Challenges were encountered during the user testing stage, particularly regarding the restricted pool of participants for testing. The original plan was for the application to undergo

thorough evaluation over an extended timeframe to assess its efficacy in promoting mindfulness among users. However, only one testing session could be conducted due to time limitations. Moreover, the participants were exclusively OCAD students, offering valuable input but potentially overlooking diverse feedback from art and design students at different educational institutions. Additionally, a difficulty arose in engaging participants for the general survey, leading to a response rate of merely 13 individuals.

A vital obstacle revolved around the voice bot's efficiency in promptly responding to user inputs. Converting audio inputs to text and then generating audio responses proved more time-consuming than initially thought, impacting the user interaction quality.

The constraints and obstacles underscore avenues for forthcoming investigation and advancement, emphasizing the necessity for widened experimentation, more extensive recruitment of participants, and enhanced technological proficiency to enhance the functionality and user interaction of the prototype.

○ Future Pathways and Applications

Despite initial challenges, the concept of a fidgety wearable device presents considerable promise. Expanding user testing's scope is crucial in gathering diverse insights and feedback. By broadening the participant base past OCAD students, the project can acquire a deeper understanding of the needs and preferences of a broader art and design student community. The application interface demands significant enhancements to improve navigation and enhance the overall user experience. Personalizing the voice bot Sati not only for OCAD students but also for students in the art and design field more broadly is a crucial move towards inclusivity and versatility. Assigning Sati an avatar could introduce a new level of personalization, increasing the appeal and relatability of interactions. Incorporating diverse voice options and expanding Sati's knowledge base will enable the delivery of tailored mindfulness practices specifically designed for art and design students. Furthermore,

there is still room to investigate more regarding privacy and ethics in the application's development, especially as Sati uses user information to tailor replies and mindfulness exercises. Future development will need to address these issues fully in order to maintain user trust and comply with data protection standards.

○ Final Remarks

Concluding this thesis, it becomes evident that the exploration of the integration of mindfulness applications with AI and wearable technology for art and design students has been both a challenging and enriching learning journey. Despite the hurdles faced including technical limitations and user testing, each step has provided valuable insights into designing solutions that specifically cater to the needs of creative students.

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APPENDICES

Appendix A: General Survey

1. How often do you experience creative blocks or difficulties in generating new ideas for your projects?
 - Never
 - Rarely
 - Occasionally
 - Frequently
 - Always
2. In your opinion, what are the main stressors or challenges unique to art and design students?
3. How do deadlines and project timelines impact your stress levels as an art and design student? (scale 1-10)
4. Design being subjective, how do you deal with the feedback and criticism that you receive on your work?
5. How do you maintain your motivation and passion for your chosen field of study?
6. How do you cope with stress, anxiety, or negative emotions that affect your creativity?
7. How familiar are you with the concept of mindfulness practices? (scale 1-10)
8. How often do you practice mindfulness exercises?
 - Never
 - Rarely
 - Occasionally
 - Frequently
 - Always
9. Have you used any mindfulness apps before? If yes, which ones?
10. What are the main challenges or barriers that prevent you from practicing mindfulness regularly or effectively?
11. How interested are you in using a mindfulness app, voice assistant AI, and wearable technology to enhance your mindfulness practices and creative flow
 - Not necessary
 - Slightly necessary
 - Moderately necessary
 - Very necessary
 - Extremely necessary
12. On a scale of 1-10, how stressful do you find your creative journey as an art and design student?
13. On a scale of 1 to 10, how likely are you to participate in a one-hour mindfulness practice using the proposed app and integrated technology?
14. Do you believe there is a necessity for a mindfulness application specifically designed to address the issues faced by art and design students?
 - Not necessary
 - Slightly necessary
 - Moderately necessary
 - Very necessary
 - Extremely necessary

Appendix B: Detailed transcript of SATI's response

Hi! How may I assist you today?

I am feeling a creative block. What should I do?

Ah, hitting 'a creative wall can be a real drag, but don't stress! We all get those days when the inspo just isn't flowin'. Here are a few tips to help you smash through that block:

Change Your Scenery: Sometimes, all it takes is a change of environment to refresh your senses. Hit up a café in Queen West, stroll through Trinity Bellwoods, or just park yourself at a different spot in OCAD and soak in the energy.

Sketch it Out: Grab your sketchbook and just start doodling without any goal. Let your hand roam free and your mind wander. No judgment, no pressure.

Collab with a Buddy: Sometimes collaborating with a fellow artist can spark ideas. Bounce thoughts off each other, build on concepts, or just have a chill jam sesh.

Art Crawl: Hit the galleries around Toronto! A visit to the AGO or smaller local galleries can be super inspiring. Seeing other artists' work can give you that 'Eureka!' moment.

Chill and Reflect: Maybe you just need to take a minute. Meditate, listen to music, or hit Kensington Market for some people-watching.

Creative Workshops: Check out any workshops happening at OCAD. Learning a new technique or medium can reignite your creative fire.

Analog Hour: Break from digital. Put your phone down, close the laptop, and disconnect for a bit. Sometimes social media and digital noise are creativity killers.

Nature's Muse: Take inspiration from Mother Nature. Toronto's got tons of natural beauty from the lakeshore to High Park. Get out there, get some fresh air, and get inspired. **Random Inputs:** Read a book on something totally unrelated to your discipline, watch a documentary, or listen to a new genre of music. Random inputs can lead to unexpected creative connections.

Routine Break: Switch up your routine completely. If you're a night owl, try an early morning start. If you always paint, try sculpture. Shaking up the normal can lead to interesting results.

Remember, it's perfectly okay to experience creative block. It's part of the process. Just keep pushin' through, stay true to your art, and you'll come out the other side with some fresh ideas and a new perspective. Keep at it, and if you need a chat or some more Toronto-specific tips, I'm here for ya!

Appendix C: Detailed transcript of SATI's response (OpenAI Assistant's API)

User

I am feeling a creative block. What should I do?

Sati V2

Creative blocks can feel like barriers to your expression, but they're also opportunities to step back and find new sources of inspiration. Here's a simple yet effective mindfulness exercise you might find helpful in such moments:

Focused Breathing Exercise:

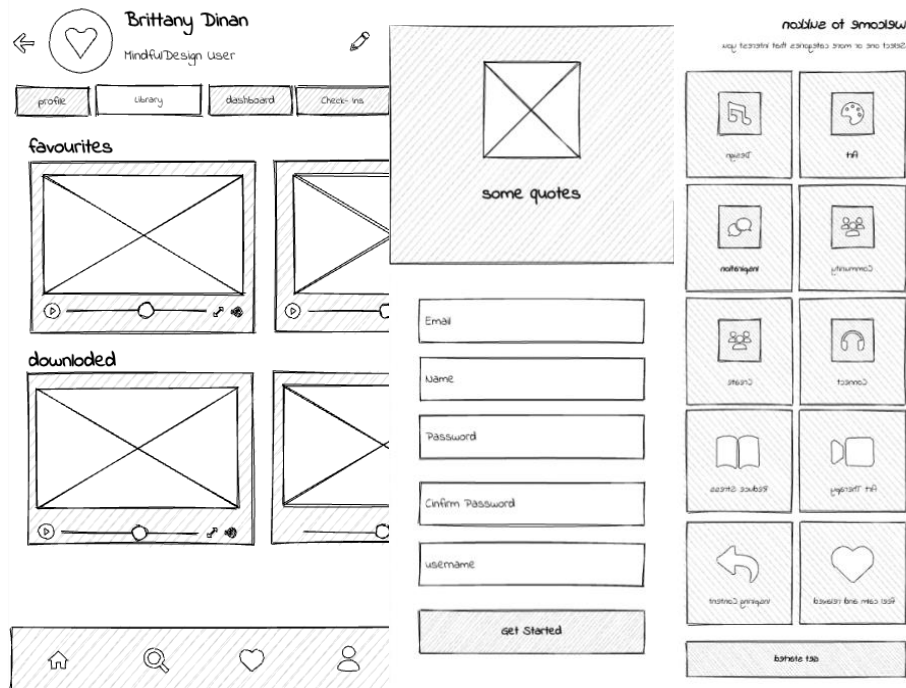
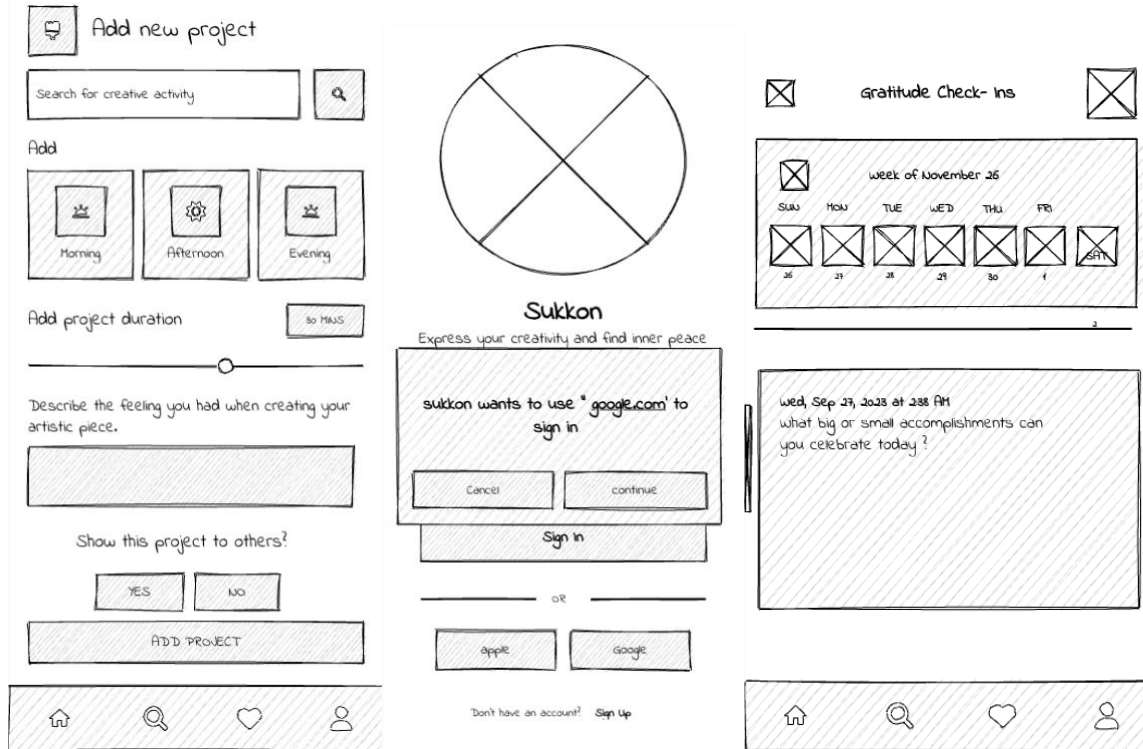
- 1 - Find a quiet space where you can sit comfortably.
- 2 - Close your eyes and take a deep breath in, counting to four as you inhale.
- 3- Hold the breath for a count of four.
- 4 - Exhale slowly, over a count of six, letting all the air out of your lungs.
- 5- Repeat this cycle for a few minutes.

As you focus on your breath, you'll notice that your mind starts to quiet down. Thoughts about your creative work may still float into your awareness but try to let them pass without getting attached to them. With each breath, imagine exhaling the tension and inhaling a new, clear space for creativity. Remember, every artist and designer at OCAD has likely felt stuck at some point. It's a natural part of the creative process. You're surrounded by peers who understand what you're going through.

Sometimes the best thing to do is to take a walk around the creative studios, soak in the buzz of creativity from your fellow students, or step outside and find fresh air in Grange Park. Just being in a different environment can shift your perspective and help clear the way for new ideas.

Keep in mind that creative blocks are temporary. Give yourself permission to take a break from the pressure of producing and trust in your ability to return to your projects with fresh eyes and renewed vigor. You've got this!

Appendix D: Wireframing done with uizard.ai.



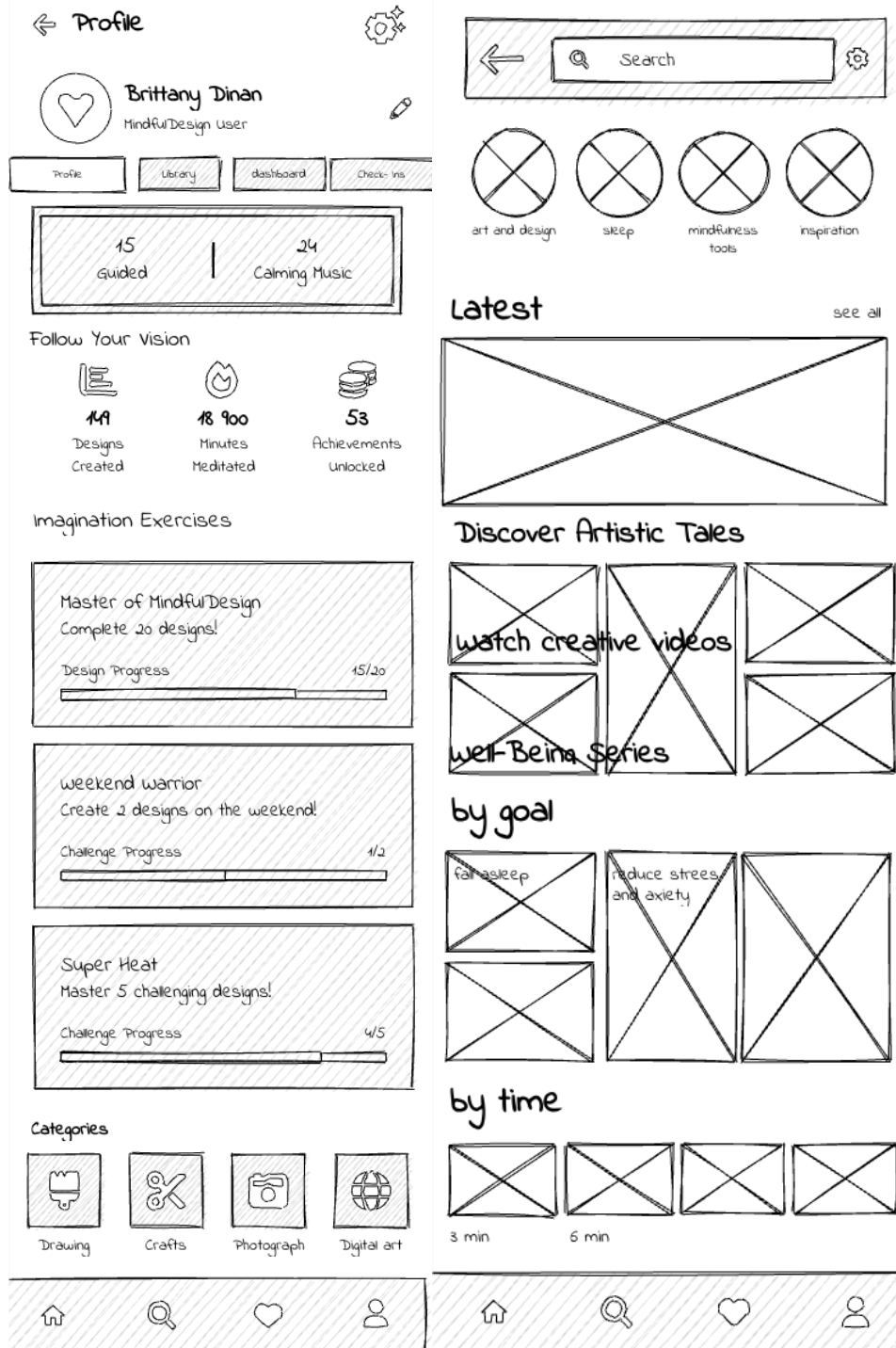
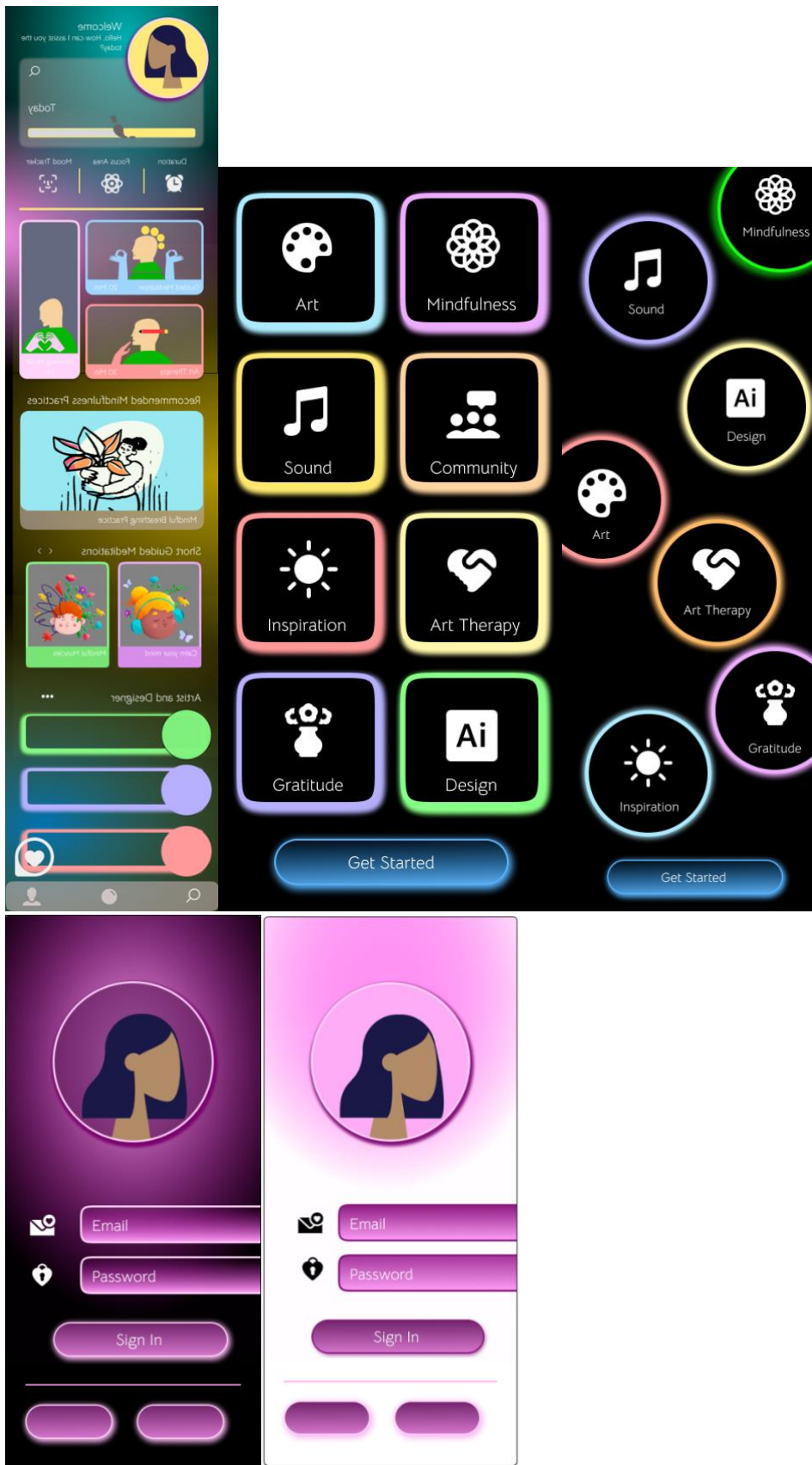
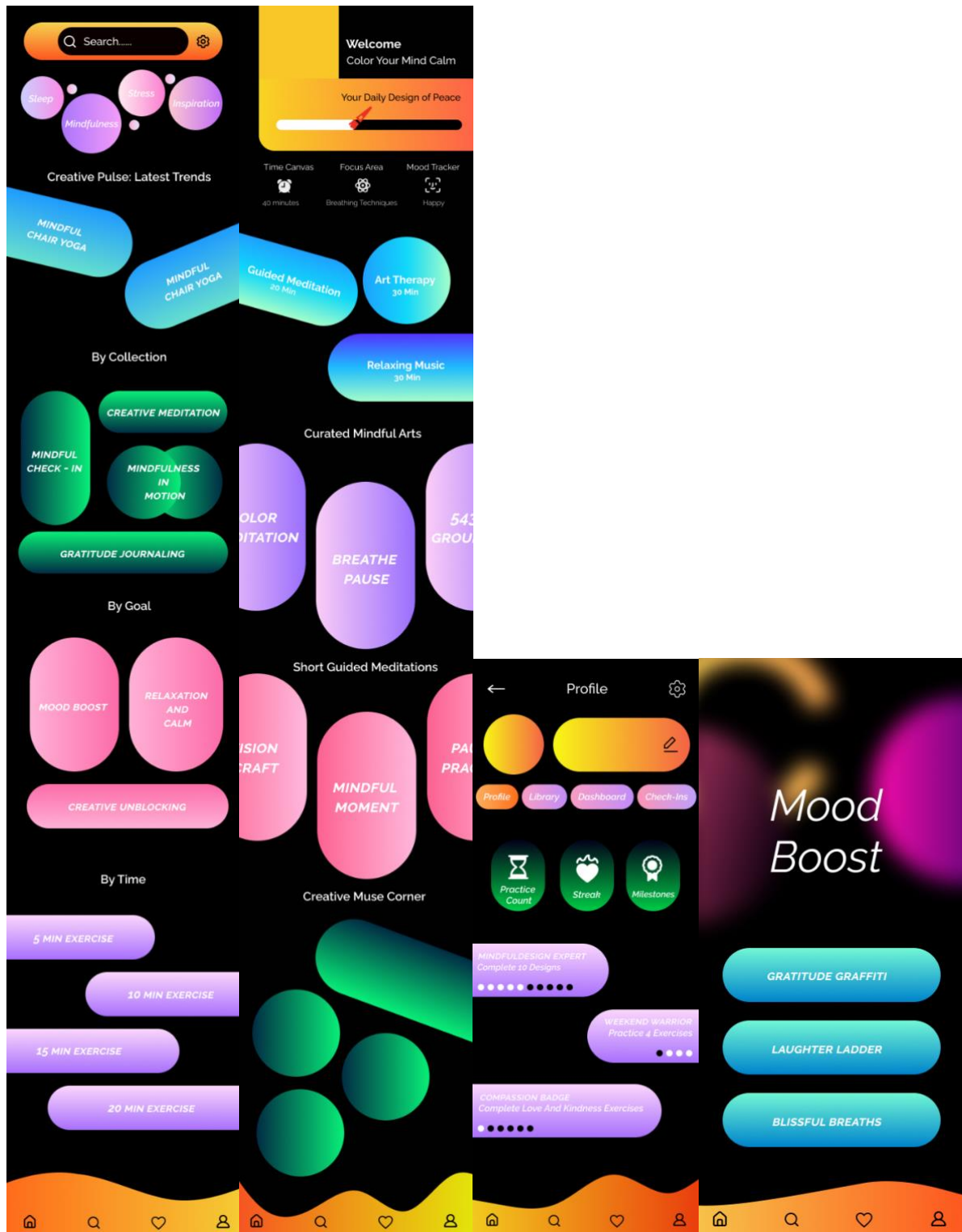


Figure 32 - Home and explore page

Appendix E: Initial design language done in Figma.



Appendix F: Final Design Language using Figma.



Appendix G: Consent Form

Date:

Project Title: “Integration of the Mindful App with Voice Assistant AI and Wearable Technology for Art and Design Students”

Student Investigator:	Faculty Supervisor	Faculty Supervisor
Prathistha Gera	Dr Alexis Morris	Dr Adam Tindale
Digital Futures	Faculty of Arts & Science	Faculty of Arts & Science
OCAD University	OCAD University	OCAD University

PURPOSE

The purpose of this study is to assess the effectiveness of integrating the Mindful App with voice assistant AI and wearable technology in enhancing mindfulness practices and promoting well-being among art and design students. Aim to recruit around 15-20 participants who are art and design students. Eligibility criteria include being an art and design student, aged 18 or above, and willing to use the Mindful App for an hour. This research is being completed by a graduate student in partial completion of their degree, and the results will contribute to their thesis.

WHAT'S INVOLVED

As a participant, you will be asked to:

You will first complete a survey or questionnaire to share your challenges and assess the need for the Mindful App tailored for art and design students. Based on the identified issues, customized options in the app will be created.

Use the Mindful App integrated with voice assistant AI and wearable technology for approximately just an hour.

Provide feedback on your experience using the app and any changes you notice in your mindfulness practices and overall well-being. This also involves the completion of pre- and post-survey questions.

There are no costs associated with participation. All activities related to the study will be conducted on campus. We will also collect demographic data such as age and academic major for the purpose of the study. Please note that all your information will be kept confidential and used only for research purposes.

POTENTIAL BENEFITS

Participants may experience several benefits, including contributing to the development of a specialized Mindful App designed for art and design students. This app addresses challenges specifically faced in the creative journey, potentially improving your well-being and mindfulness practices. These benefits, however, cannot be guaranteed as they can vary among individuals based on their unique experiences and responses to mindfulness practices.

POTENTIAL RISK

Participants might experience discomfort in discussing personal challenges in their creative journey. To manage this, participants will be reassured that they can choose not to answer any questions that make them uncomfortable. All information shared will be kept confidential and used only for research purposes. There are no known catastrophic effects associated with participation in this study. If any significant physical or psychological risks are identified during the study, the researcher may choose to terminate the study.

CONFIDENTIALITY

All information collected during this study will be kept confidential. Your responses will be identified only by a unique participant ID or Pseudonyms will be assigned to ensure anonymity., and only the research team will have access to the raw data. Any reports or publications based on this research will use only aggregated data and will not identify you or any individual as being part of this study.

Audio- or videorecording:

Participants have the right to review and edit recordings or transcripts. Recordings will be securely stored, with limited access granted only to the research team. Raw and transcribed recordings will not be used for educational purposes without explicit consent. Recordings will be destroyed before the study concludes on April 30th. Participants will have the option to choose their level of anonymity during the consent process. If you agree to be recorded, this will be indicated by a separate checkbox or signature line on the consent form.

Confidential Survey/Questionnaire: Your participation is confidential, and no personally identifiable information will be linked to the collected data. Your responses will be aggregated with those of other participants, ensuring individual anonymity in all research reports.

Data collected during this study will be securely stored on OneDrive, provided by OCAD University. OneDrive ensures a high level of data security and is accessible only to the research team through password-protected accounts. No personally identifiable information will be disclosed in any reports or publications. If there is a need to release information to another party, the agency/person to which the information will be furnished, the nature of the information, and the purpose of the disclosure will be clearly communicated to you and your explicit consent will be obtained.

The data will be retained for a period of one year, after which all data will be permanently deleted from our servers.

Access to this data will be restricted to student investigator - Prathistha Gera, Primary advisor - Dr Alexis Morris and Secondary Advisor - Dr Adam Tindale

INCENTIVES FOR PARTICIPATION

Participants in this study will not receive any incentives for their participation.

VOLUNTARY PARTICIPATION

Participation in this study is voluntary. You may decline to answer any questions or participate in any component of the study without any penalty or loss of benefits to which you are entitled. Your choice of whether or not to participate will not influence your future relations with OCAD University or the student researcher Prathistha Gera, involved in the research.

You may decide to withdraw from this study before February 20, 2024. To do so, please inform the student researcher at any point during the study or send an email to.

If you wish to withdraw your data from the study, please contact Prathistha Gera by email no later than February 20, 2024. Data collected until this point will be removed and disposed of in a manner that ensures your privacy and confidentiality.

PUBLICATION OF RESULTS

The results of this study will be published in the student thesis. In any publication, data will be presented in aggregate forms.

CONTACT INFORMATION AND ETHICS CLEARANCE

If you have any questions about this study or require further information, please ask. If you have questions later about the research, you may contact the student researcher Prathistha Gera or the Faculty Supervisors Dr. Alexis Morries and Dr. Adam Tindale using the contact information provided above. This study has been reviewed and received ethics clearance through the Research Ethics Board at OCAD University [[102486]].

If you have questions regarding your rights as a participant in this study please contact:

Research Ethics Board c/o Office of the Vice President, Research, and Innovation
 OCAD University
 100 McCaul Street
 Toronto, M5T1W1
 416 977 6000 x4368
 research@ocadu.ca

AGREEMENT

I agree to participate in this study described above. I have made this decision based on the information I have read in the Information-Consent Letter. I have had the opportunity to receive any additional details I wanted about the study and understand that I may ask questions in the future. I understand that I may withdraw this consent at any time.

Thank you for your assistance in this project. Please keep a copy of this form for your records.

Audio- or videorecording

I provide consent to be [audio-/video-recorded] for the purposes of this study. I comprehend the protocols for the storage and eventual destruction of these recordings. I am aware that any information will be anonymized, and in case of future use, faces and pictures will be blurred for anonymization.

I do not agree to be recorded for the purposes of this study.

Name: _____

Signature: _____

Appendix E: Pre and Post questionnaire questions

Pre-Questionnaire

1. How would you describe your current level of educational stress right now?
2. On a scale of 1 to 5, how satisfied are you with your ability to manage stress?
3. How are you feeling right now? Please choose one word or phrase that best describes your current emotional state.
4. How do you define mindfulness and what does it mean to you?
5. How often do you currently engage in mindfulness practices or activities?
 - Never • Rarely • Occasionally • Frequently • Always
6. To what extent do you believe technology can positively impact your mindfulness practices and well-being?
7. Are you familiar with or have you ever used mindfulness apps, voice assistants, or wearable technology for well-being purposes?

Post Questionnaire

1. How has your stress level changed after using the app?
2. On a scale of 1 to 5, how satisfied are you with the impact of these technologies on your mindfulness and well-being?
 - 1 (Not at all satisfied) • 5 (Extremely satisfied)
3. If you were to have the app, how frequently do you plan to continue using the app, voice assistant, for mindfulness practices after the intervention?
 - Once a day • Several times a week • Once a week • A few times a month • Rarely • Not at all
4. To what extent do you believe these technologies could contribute to reducing educational stress or enhancing your creative well-being as an art and design student?
5. How satisfied were you with the features, functions, and design of the app, voice assistant?
 - Not at all satisfied. • Slightly satisfied. • Moderately satisfied. • Very satisfied. • Extremely satisfied.
6. What suggestions or recommendations do you have to improve the app, voice assistant for future users?
7. Were there specific features or aspects of the tailored mindfulness activities that you found particularly helpful or enjoyable?
8. How would you rate the app, voice assistant, and wearable on a scale of 1 to 5, where 1 is very poor and 5 is excellent?
9. What are the main features or functions of the app that you use or like the most?
10. How easy or difficult do you find the app to use or navigate?
 - Very easy • Somewhat easy • Neither easy nor difficult • Somewhat difficult • Very difficult

11. Are the tailored mindfulness practices effective for you?

- Very effective
- Somewhat effective
- Neither effective nor ineffective
- Somewhat ineffective
- Very ineffective

12. Any thought you want to share regarding Sati?

Appendix F: Code -I

```

from flask import Flask, request, send_file
import os
from flask_cors import CORS
app = Flask(__name__)
CORS(app)
import utils

@app.route('/getaudio', methods=['POST'])
def get_audio():
    # Check if a file is provided in the request
    if 'audioFile' not in request.files:
        return 'No file part', 400

    file = request.files['audioFile']

    # If the user does not select a file, the browser submits an
    # empty file without a filename.
    if file.filename == "":
        return 'No selected file', 400

    filename = 'received_audio.wav'
    file.save(filename)

    transcript = utils.get_transcript(filename)
    get_assistant_reply = utils.get_assistant_reply(query=transcript)
    assistant_reply_voice = utils.get_text_to_audio(get_assistant_reply)

    return send_file(assistant_reply_voice, as_attachment=True)

if __name__ == '__main__':
    app.run(debug=True, port=5001)

```

(Elfving, 2024) ((*Flask - (Creating First Simple Application)*, 2017) (*How to Create a Voice Chatbot Using Openai's API*, 2023) (Erenler, 2024) (1littlecoder, n.d.) (taipy, 2024)

Appendix G: Code -II

```

from openai import OpenAI
import time
from pathlib import Path

client = OpenAI()

def get_transcript(audiopath):
    audio_file= open(audiopath, "rb")
    transcript = client.audio.transcriptions.create(
        model="whisper-1",
        file=audio_file
    )
    return transcript.text

def get_assistant_reply(query):

    threadId = "thread_1tbMkWbmGjt5r6noxZt6Sax4"
    assistantId = "asst_wqVLBOND1ihceQ5Cts1L3EAf"
    message = client.beta.threads.messages.create(
        thread_id=threadId,
        role="user",
        content=query
    )

    run = client.beta.threads.runs.create(
        thread_id=threadId,
        assistant_id=assistantId,
        instructions="Provide concise, empathetic responses tailored for OCAD students. Focus on
mindfulness and creativity support, using a warm tone. Avoid unrelated content and specifics on
unavailable exercises..."
    )

    response = "Couldn't get response. something went wrong."
    while True:
        run = client.beta.threads.runs.retrieve(
            thread_id=threadId,
            run_id=run.id
        )
        time.sleep(1)
        if run.status == 'completed':

```

```
    messages_ = client.beta.threads.messages.list(
        thread_id=threadId,
    )
    response = messages_.data[0].content[0].text.value
    break
return response

def get_text_to_audio(text):
    speech_file_path = Path(__file__).parent / "speech.mp3"
    response = client.audio.speech.create(
        model="tts-1",
        voice="nova",
        input=text
    )
    response.stream_to_file(speech_file_path)
    return "speech.mp3"
```

(Elfving, 2024) ((*Flask - (Creating First Simple Application)*, 2017) (*How to Create a Voice Chatbot Using Openai's API*, 2023) (Erenler, 2024) (1littlecoder, n.d.) (taipy, 2024)