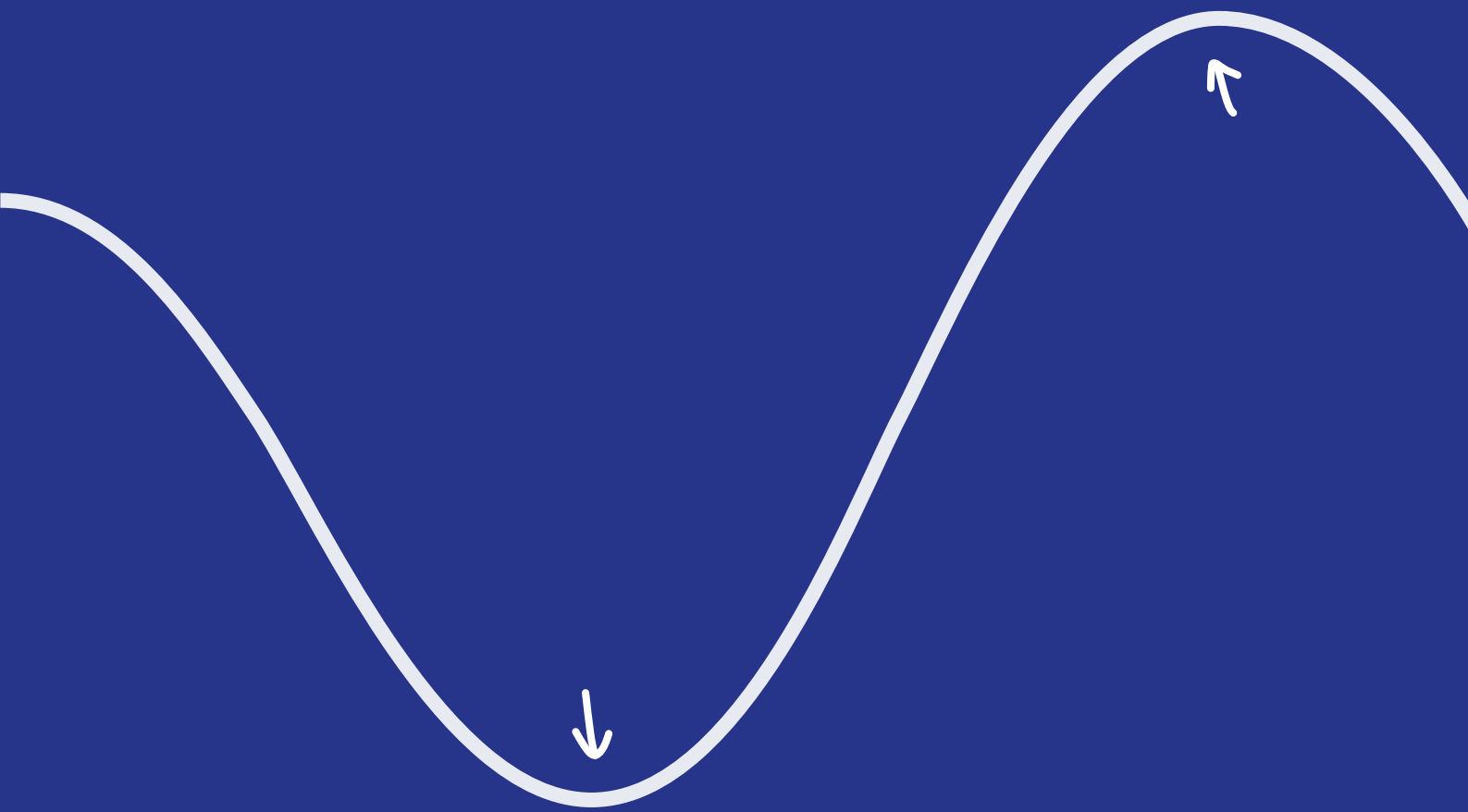


Building Design Resilience

Exploring AI on supporting design students' mental well-being throughout the design study



Master graduation thesis
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Master Thesis

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Delft

Design is more than creating for others,
but also a process to discover yourself.

PREFACE

I am honoured that you have taken the time to read my thesis.

This project began from a very personal experience — my two-year journey of studying industrial design at TU Delft. As an international student, it was never easy to adapt to the culture, language and education in a completely new environment here. Throughout my study, I experienced numerous challenges and difficulties, which made me feel stressed, anxious and lost. For a long time, I was trapped in the spiral of those negative feelings. After slowly recovering from that hard time, I started reading some books about anxiety and depression, which helped me understand what I've gone through. I do think the society needs more education and knowledge for our mental health but now it's still not an easy, open topic. That's why I want to do something about this.

In this graduation project, I got the chance to dive deeper into the reason behind the anxieties faced by design students. "Why do we have anxiety?" "How can we learn from that anxiety?" And most importantly, "As designers, how can we build the mental resilience when facing those challenges in our future practices?" Through this thesis, I will show the insights that I collected from my research and also my reflection on dealing with anxiety regarding my graduation project in the end. Hope it can offer inspiration or comfort to others going through something similar.

Here, I would like to thank my supervisors, Valentijn and Gert, for giving me the opportunity to work on this self-motivated project. I thoroughly enjoyed all our meetings and always left feeling inspired. You gave me freedom to explore different knowledges while providing the guidance to shape the depth of this project. Valentijn, your sharp eye and critical thinking pushed me in the direction I wanted to move towards, and I'm genuinely inspired by your thoughtful considerations of the mental health topic. Gert, thanks for your boundless energy and encouragement. Your knowledge and expertise allowed me to explore a range of design solutions that came to the final outcome of this work.

Furthermore, I would like to thank people who participated in my research, pilots, and tests. Thank you for your time and honesty. To my friends, thank you for sharing the experience regarding this topic. I really enjoy the time talking about our joys and struggles of studying in IDE, which helped me a lot to shape my design in the end. Last but not least, to my family, I'm grateful to have someone by my side who continuously supported me and always made me feel reassured.

Now it is time to close this chapter and move on to the next. I would be more than happy to chat about my thesis if you ever feel the urge.

Sincerely,
Xiaohan

ABSTRACT

Mental health concerns are increasingly prevalent among university students. Due to the unique nature of design subjects, design students experience different challenges during the study which often trigger anxiety. While anxiety is commonly regarded as a negative emotion, psychology suggests it can also serve as a catalyst for resilience and growth when addressed constructively. This project explores how to support design students' mental health by targeting their anxiety and helping them to build mental resilience during their study.

Building on literature from psychological theory, positive psychology, the Resilient Designer principles and wide implementations of AI in mental health fields, the research led to the **final outcome – Lumi**, a mental health tool designed to support design students' emotional well-being. Lumi aims at supporting design anxiety and also helping in building mental resilience, enabling students to capture and reflect on emotional moments throughout their projects.

To ground the design for real users and scenarios, I conducted user research with design students at TU Delft, who shared experiences of anxiety around their study lives in IDE. Their voices revealed two distinct needs: immediate support during moments of anxiety and deeper reflection afterwards to learn from these experiences. These insights shaped Lumi's dual role as both an emotional companion in stressful moments and a reflective coach for long-term resilience building.

The evaluation of Lumi focused on the main functions: anxiety coping and end-of-project reflection. Findings suggest that Lumi can reduce momentary anxiety with proper AI support and the AI insights of the emotional journey encourage the self-awareness of anxiety triggers. Furthermore, participants highly praised the value of Lumi as a self-improvement tool, though they also expressed a preference for more autonomy and a balance between AI intervention and personal reflection.

To summarise, this project contributes to the emerging field of integrating resilience into design education by exploring how AI can implement mental health care into students' study lives. By reframing anxiety not as a barrier but as an opportunity for growth, Lumi aims to strengthen students' capacity to cope with setbacks, build confidence, and ultimately develop design resilience. The outcomes highlight the potential of AI in mental health fields, pointing out future opportunities to expand Lumi beyond design education into broader contexts of designers' well-being.

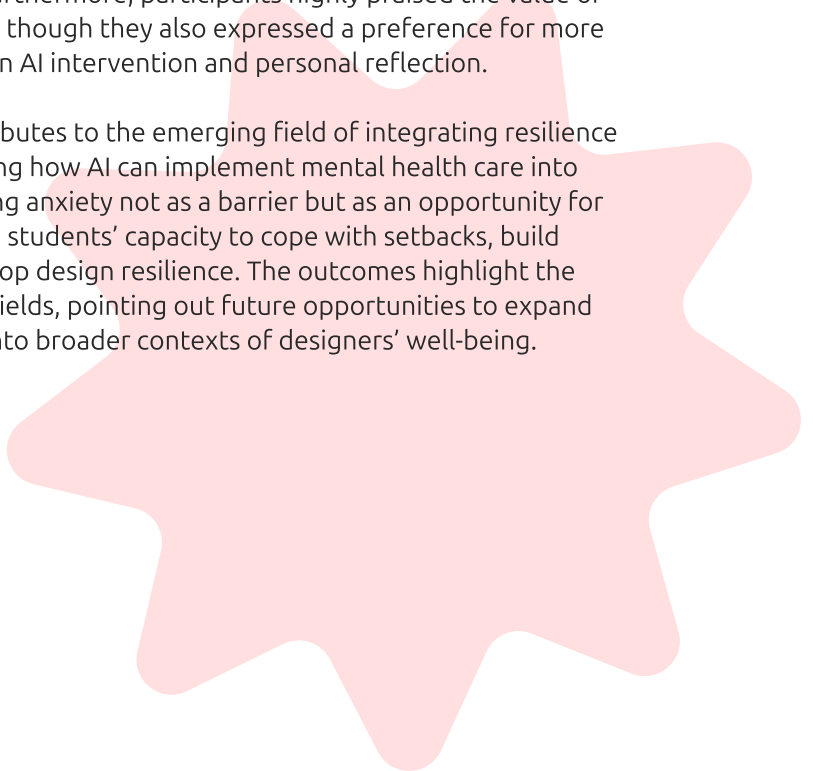


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Project Introduction

- 1.1 Background**
- 1.2 Design opportunity**
- 1.3 Project scope**
- 1.4 Research questions**
- 1.5 Approach**



"If you're going through hell, keep going."

WINSTON CHURCHILL

1.1 BACKGROUND

Mental health issues among university students

Mental health issues among university students have become a growing concern in recent years. The pervasiveness of anxiety has been increasing progressively over the years, becoming one of the most critical concerns among colleges and universities (Tan et al., 2023). which significantly impact their mental well-being. Therefore, improving university students' mental healthcare is significant. It is not only essential for improving their academic performance but also plays a crucial role in fostering their long-term personal development and resilience (Chaudhry et al., 2024).

Mental well-being for design students

Design students are not exempt from these problems. However, compared with other subjects, design is inherently open-ended, non-linear, and necessarily exploratory and experimental as part of the creative process (Roozenburg and Eekels, 1998). That means design students regularly face uncertainty and frequent setbacks (Bason, 2010), as well as exposure to public critique (Manzini, 2015). All of this can heighten their anxiety and self-doubt. Those negative feelings, if not addressed properly, may grow and strongly impact their mental well-being. Therefore, it is crucial for design students to cultivate mental resilience in order to effectively cope with the anxiety when encountering setbacks during their design study.

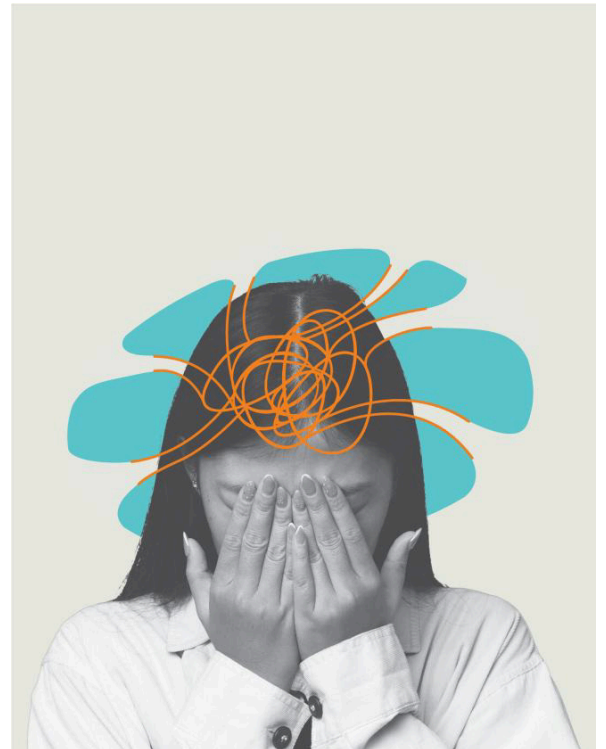


Figure 1.1: A girl trapped in mental stress (Straits Times, n.d.).

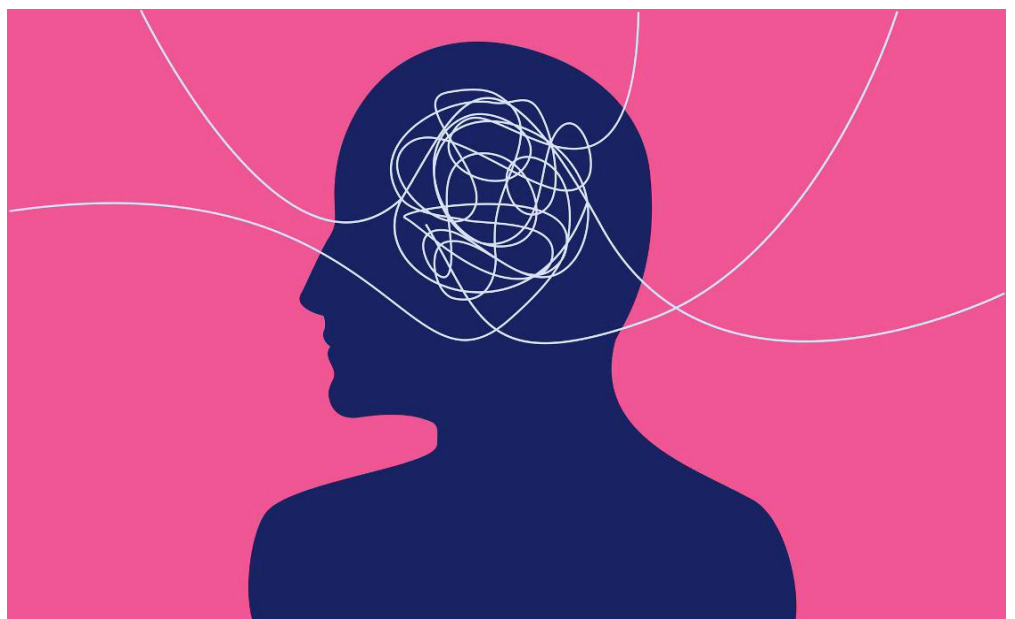


Figure 1.2: tangled thoughts representing mental health challenges (Neurowellness Spa, n.d.)

1.2

DESIGN OPPORTUNITY

Psychological approach of dealing with anxiety and enhancing resilience

Anxiety is often perceived as a negative feeling that should be eliminated or suppressed. Most of the time, we adopt problem-solving approaches to manage anxiety, focusing on immediate solutions rather than exploring underlying reasons. However, if we look at it critically, anxiety can also serve as a valuable force, promoting not only our resilience when facing setbacks but also contributing to personal growth (Southwick & Charney, 2018).

Positive psychology offers a new perspective on understanding anxiety. Rather than avoiding it, it emphasises acknowledging, accepting, and embracing them as part of building inner resilience (Wong, 2011). This approach can be closely combined with Cognitive Behavioural Therapy (Beck, 1976), an intervention widely used by psychologists. It focuses on reframing unhelpful thoughts to improve emotions and behaviours, which turns out to be an effective and enduring way to deal with anxiety (Hollon et al., 2006).

Building resilience for designers

Design students are not exempt from these problems. However, compared with other subjects, design is inherently open-ended, non-linear, and necessarily exploratory and experimental as part of the creative process (Roozenburg and Eekels, 1998). That means design students regularly

face uncertainty and frequent setbacks (Bason, 2010), as well as exposure to public critique (Manzini, 2015). All of this can heighten their anxiety and self-doubt. Those negative feelings, if not addressed properly, may grow and strongly impact their mental well-being. Therefore, it is crucial for design students to cultivate mental resilience in order to effectively cope with the anxiety when encountering setbacks during their creative journey.

Opportunity in conversational AI

Conversational AI has been widely implemented in daily conversation and turns out to be an effective and promising way to deliver mental health therapy (Rollwage, 2023). There lies a big opportunity that we can use conversational AI to help people understand the anxiety and propose personalised strategies about dealing with the anxiety. However, there are also risks of using AI as a mental therapy tool. Thus, a proper design to consider those factors is needed.

Aim of the project

The aim of this project is to **explore design interventions that could bridge psychological theory and research on resilient designers to deal with the anxiety and support designers' mental health** (Figure 1.3). In particular, the project seeks to leverage conversational AI as a tool to help people reflect on their anxiety in order to build mental resilience.

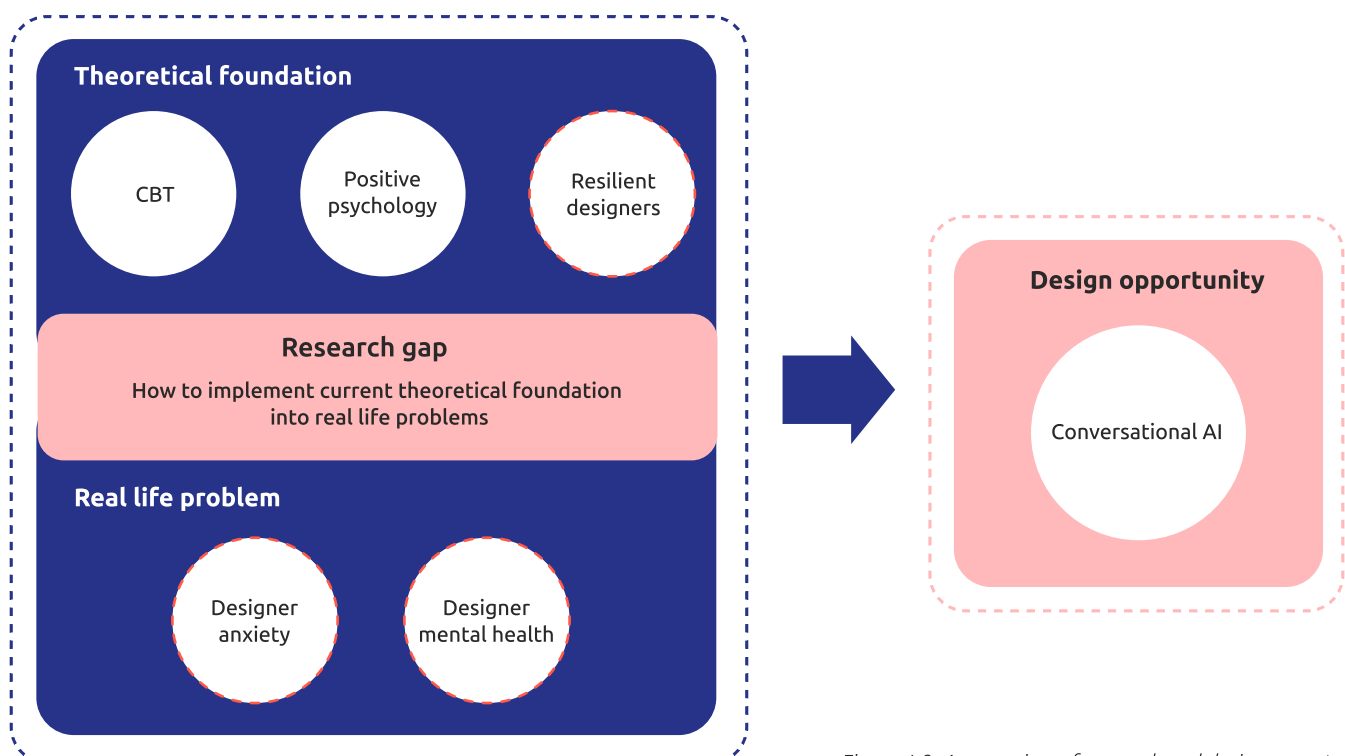


Figure 1.3: An overview of research and design opportunity

1.3

PROJECT SCOPE

This thesis focuses on **design students in higher education, specifically students in the industrial design domain**. The decision to narrow the scope to this group is intentional for the user research purpose that the participants who intended to take part in it are all design students in the university, and they commonly suffer from anxiety during their study progress. However, it is obvious that anxiety is a widespread issue across designers in different stages and disciplines. The research and design outcome can also be further developed and iterated into other design contexts or career stages but will not be addressed in this project.



Figure 1.4: Industrial Design Engineering students (TU Delft, n.d).

1.4

RESEARCH QUESTIONS

To address the research gap and design opportunity, the following research questions (RQs) are listed below to form the research methods and find the answers.

RQ1 - What cause the anxiety & how to build resilience?

- What's the reason behind anxiety? How does the psychological method approach it?
- What is the designer's anxiety? In what situation/scenario does it occur? How do resilient designers address this issue?
- How can conversational AI support the process of dealing with anxiety and building resilience?

RQ2 - What are design students' anxieties?

- What scenario to focus on based on literature research? How do students experience anxiety in the scenario?
- What are students' expectations from using AI chatbot?
- What's the user journey map in the scenario? What's the interaction opportunity?

RQ3 - How to evaluate the design?

- What's the evaluation criteria for the design?
- What methodology can be used to evaluate it?
- What's the evaluation result?

1.5 APPROACH

The project is structured in four phases: a literature research phase, a user research phase, a design phase, and an evaluation phase (*Figure 1.5*).

The literature research phase (Chapter 2) involves the theoretical findings from positive psychology and designer resilience. How those foundations can contribute to reducing anxiety and building resilience for design students. The research also involves the current implementation of AI in mental health fields and why AI could serve as a storytelling tool to explore possible design solutions. These could serve as the inspiration in the design phase.

The user research phase (Chapters 3 & 4). The user interviews were conducted to know the scenarios of design anxiety and the user's expectations of using the tool. The expectations will be summarised as the foundation for the further development of concepts and evaluations. A journey map was structured to explore interaction opportunities of using an AI chatbot.

The design phase (Chapters 5 & 6) adopted a research-through-design approach (Stappers and Giaccardi, 2017). Two design directions were set based on research to generate concept ideas through brainstorming and testing. In the end, the final concept - Lumi was developed based on literature study, user research results and testing feedback.

The evaluation phase (Chapter 7), was structured to evaluate the design.

- 1) the user experience of Lumi;
- 2) the anxiety coping effect;
- 3) the resilience building effect for design students in the long-term.

The discussion part (Chapter 8), I reflected on the limitations and recommended some suggestions about further implementation of Lumi in design education and industrials.

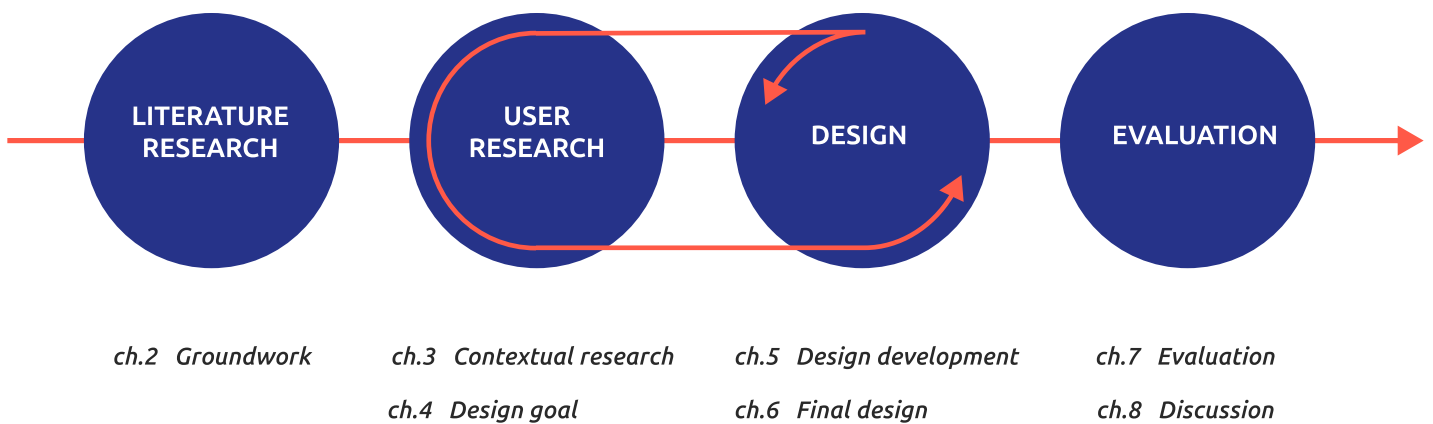


Figure 1.5: An overview of the design process

Groundwork

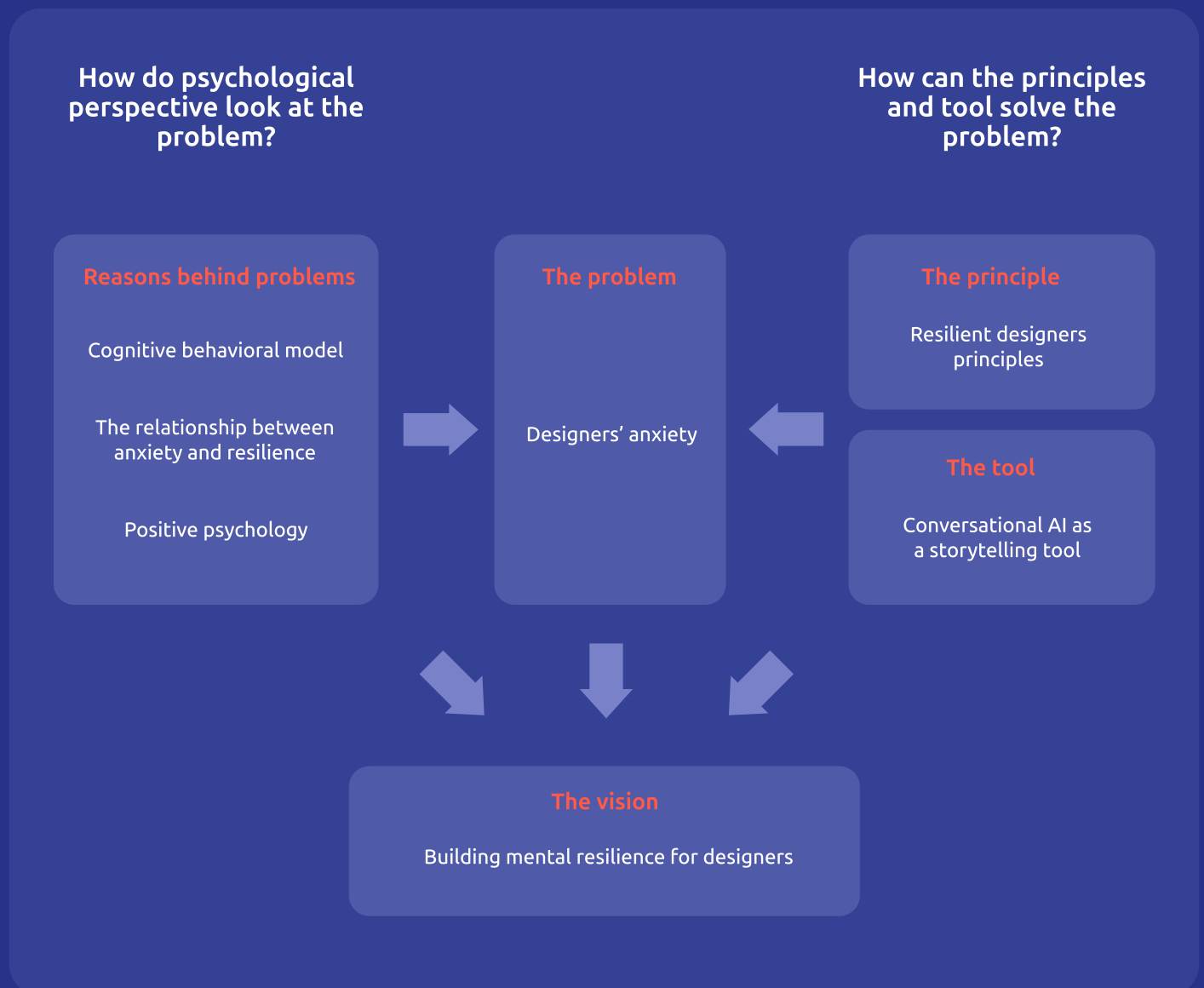
- 2.1 Psychological foundation** - from anxiety to resilience
- 2.2 To be a resilient designer**
- 2.3 Storytelling** - an approach to develop resilience
- 2.4 AI Chatbots for mental health**
- 2.5 Synthesis**
- 2.6 Forming the initial design goal**

Introduction

To understand why anxiety happens and how to build mental resilience for design students, this chapter draws on psychological perspectives in several parts: **What leads to anxiety, the cognitive behavioural model, and positive psychology**. Also, I included research on building resilience for designers in order to approach the following research questions:

RQ1 - Understand anxiety & resilience

- What's the reason behind anxiety?
- How does the psychological method approach it?
- What is the designer's anxiety? In what situation/scenario does it occur?
How do resilient designers address this issue?
- How can conversational AI support the process of dealing with anxiety and building resilience?



RESILIENCE

The capacity to withstand or to recover quickly from difficulties



2.1

PSYCHOLOGICAL FOUNDATION

What is resilience

Resilience is broadly defined in psychology as the capacity to persist and bounce back when faced with stressors (Sisto et al., 2019). Importantly, it does more than help someone survive a hardship but often helps them grow from it. Psychologists have observed that overcoming challenges fosters resilience by developing new skills, enhancing self-awareness, and boosting confidence. One expert defines resilience as a “reintegration of self” that involves moving forward in a positive way for future challenges (Southwick & Charney, 2018).

Resilience is often seen as a foundation for personal growth. Research also emphasises that people can cultivate coping skills, mental flexibility, and emotional strength through training and practice (Southwick & Charney, 2018). This means that anyone can learn to become more resilient by developing habits of thinking and behaviours that help overcome setbacks.

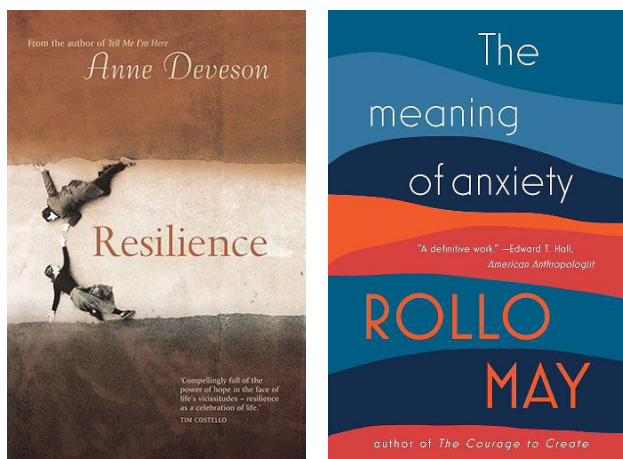


Figure 2.1: Books about mental health (Left: *Resilience*, by Anne Deveson; Right: *The meaning of anxiety*, by Rollo May)

Because resilience matters to both well-being and growth, it has become a key focus in higher education and professional development. Studies in educational psychology suggest that resilient students tend to have better academic performance and mental health, as they can handle stress and setbacks more effectively (Hartley, 2011). Conversely, lacking resilience can lead to anxiety, burnout, or giving up when faced with setbacks.

Understand anxiety

What triggers anxiety

Anxiety is an emotion that is triggered when an individual perceives an event as threatening to their personal goals and resources. This perception leads to a state of fear, tension, and uneasiness. According to Scherer’s appraisal theory (Figure 2.2), emotions are elicited and differentiated

based on a person’s subjective appraisal of a situation’s relevance, implications, and one’s ability to cope with it (Scherer, 2001). When facing challenges or setbacks, how we appraise the situations influences the extent we experience anxiety. Thus, reasoning and understanding of one’s emotional reaction is important for future appraisals as well (Smith & Lazarus, 1990). Inspired by Desmet’s design for emotion theory (2002), there lies a design opportunity to support students’ emotion coping abilities when facing anxiety during their design study.

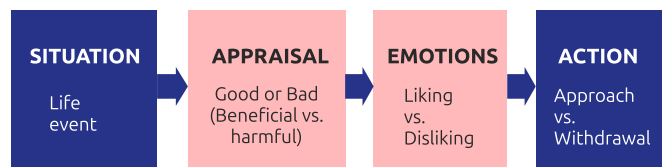


Figure 2.2: Arnold’s Appraisal Theory of Emotion, based on Reeve (2015, Figure 13.6, p.383)

Negative thinking behind anxiety

When people have anxiety, negative thoughts can increase the worry or fear. According to Beck (1976), it is not the events themselves that cause emotional distress, but the individual’s interpretation of those events. People suffering from anxiety often experience dysfunctional automatic thoughts—immediate, habitual interpretations of events that are overly negative or distorted (Ingram & Kendall, 1987).



Figure 2.3: Negative thoughts (Relationships Coach, n.d.).

For example, a design student who receives some negative criticism might have some thoughts like “The professor doesn’t like my work; I have no talent in design,” which is a negative and distorted interpretation that can spiral into anxiety syndrome or self-doubt. Changing negative thought patterns is not easy, but our minds can be trained to be more positive and healthier.

CBT for treating anxiety

Cognitive Behavioural Therapy (CBT) is a widely validated psychological intervention that focuses on the links between thoughts, emotions, and behaviours (Figure 2.4) (Mayo Clinic, 2025). The core is based on the principle that how we think about a situation greatly influences how we feel and act (Chand et al., 2023).

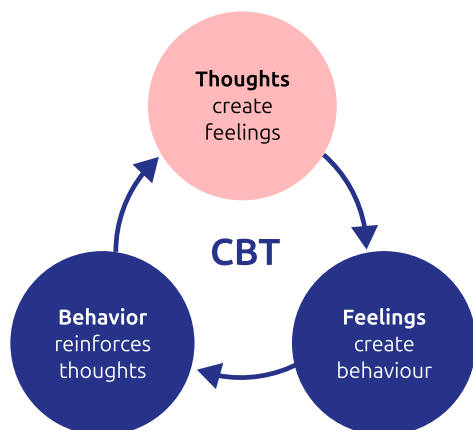


Figure 2.4: How does CBT therapy works (Cognitive Behavioural Therapy Los Angeles, 2020).

Anxiety, a natural response to perceived stress or danger, can become disruptive when persistently overwhelming, making therapy warranted. CBT is proven to be the most effective treatment for anxiety, incorporating techniques such as identifying helpful versus unhelpful thoughts, managing mental and physical tension, mindfulness, and gradual exposure to anxiety-inducing situations (Cognitive Behavioural Therapy Los Angeles, 2020). When individuals experience anxiety, CBT encourages them to become aware of automatic negative thoughts and cognitive distortions that may exaggerate or misinterpret situations.

Taking the example before, CBT techniques would encourage the student to identify and challenge this thought—asking, for instance, what evidence supports or contradicts the idea of being a “failure”, or whether there might be an alternative, more positive interpretation (e.g., “The professor is trying to help me improve this aspect; one critique doesn’t mean I’m untalented”). By restructuring these thought patterns, CBT aims to reduce negative emotions and promote more adaptive behaviours.

The relationship between anxiety and resilience

Anxiety often arises from negative appraisals of challenging events. It can also serve as a catalyst for developing resilience. Experiencing anxiety highlights the gap between perceived demands and one’s coping ability, pushing individuals to confront and adapt to difficulties. By reflecting on the anxiety, understanding how negative thoughts shaped them and how situations were appraised, one can gradually learn healthier interpretations and coping strategies. This reflective process aligns with the principles of CBT, where becoming aware of automatic thoughts and restructuring them leads to emotional growth. Over time, such reflection transforms anxiety from an uncontrollable force into an opportunity for building mental flexibility, self-awareness, and problem-solving capacity, all of which are important traits of building mental resilience.

Positive psychology on building resilience

What is positive psychology?

Positive psychology is the scientific study of human flourishing. It complements traditional psychology by shifting focus from problems and deficits to the positive aspects of human life – such as strengths, positive emotions, meaning, and personal growth (Park et al., 2014). Instead of merely solving problems with a solution-orientated mindset, it explores how individuals can flourish and foster well-being amid challenges. Studies have found that individuals who regularly think positively experience more positive emotions and a sense of efficacy, which in turn buffers them against stress and burnout (Tugade & Fredrickson, 2004). This perspective is also related to one’s self-perception: accepting oneself positively, rather than judging oneself with criticism.

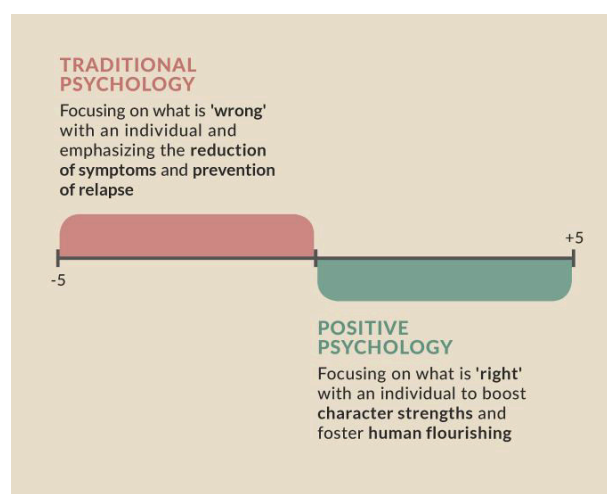


Figure 2.5: Difference between traditional psychology & positive psychology (Positive Psychology, n.d.).

A new perspective of navigating negative experience

When managing anxiety, positive psychology does not suggest eliminating negative feelings but rather reframing them to see potential positive aspects or growth opportunities. For example, a mild level of anxiety before a presentation can be reframed as excitement or a signal that one cares about the work, thus perceiving the anxiety in a constructive way. Researchers also emphasise acceptance of negative emotions rather than avoidance. In other words, acknowledging “I am feeling anxious, and that’s okay” and “It’s a normal reaction” can paradoxically reduce the negative feeling about being anxious.



Figure 2.6: Positive attitudes towards lives (Diyaata, n.d.).

How to practice positive thinking

There are many ways of applying positive psychology philosophy in daily lives. Specific approaches that are relevant to this project are discussed here:

1 Practicing gratitude

Gratitude, in particular, has been strongly associated with mental wellness and resilience. Studies show that individuals who regularly reflect on things they are grateful for tend to experience more happiness and optimism. Gratitude exercises (such as daily journaling of three good things) have been linked to a better ability to cope with stress and adversity (Harvard Health Publishing, 2021).

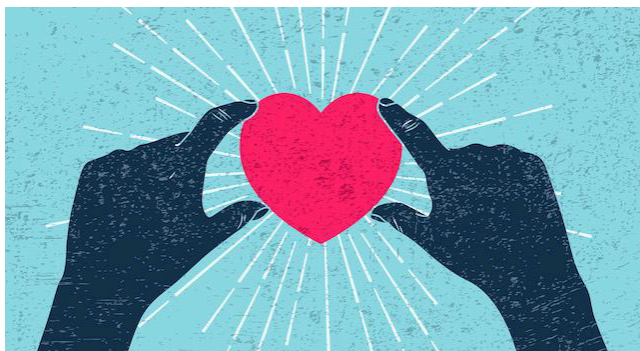


Figure 2.7: Gratitude practices for joy (Tiny Buddha, n.d.).

2 Self-compassion

Self-compassion involves treating oneself with kindness, recognising one's experiences as part of a common humanity, and maintaining mindful awareness of one's emotions (Neff, 2003). Adopting a self-compassionate mindset supports emotional resilience by reducing harsh self-criticism and feelings of isolation—factors known to exacerbate anxiety (Neff, 2012). By viewing setbacks through a self-compassionate lens, design students are more likely to learn from mistakes rather than see them as personal failures.

3 Build on strengths and virtues

Recognising and harnessing personal strengths has been shown to buffer against anxiety by bolstering positive emotions and self-efficacy. The VIA (Values in Action) (Figure 2.8) framework identifies 24 character strengths (e.g., creativity, perseverance, curiosity) organised under six core virtues (Peterson & Seligman, 2004). Individuals with higher character strengths demonstrate better stress recovery ability and resilience (Li et al., 2017). In a design education context, a strengths-based approach encourages students to identify their unique traits and strengths as designers.

VIA Character strengths

Creativity	Curiosity	Judgement	Love for learning
Perspective	Bravery	Zest	Self-regulation
Fairness	Leadership	Forgiveness	Humility
Prudence	Gratitude	Hope	Perseverance
Teamwork	Kindness	Honesty	Appreciation of beauty
Love	Wisdom	Humor	Social intelligence

Figure 2.8: Values in Action character strengths framework (Leiden Learning & Innovation Centre, n.d.).

4 Practice positive self-talk

Positive self-talk refers to the practice of engaging in supportive, affirming internal dialogue instead of critical self-blame. It serves as a cognitive strategy to challenge negative thoughts and reframe perceptions in a constructive way. This technique can reduce anxiety and improve mental health by bolstering self-efficacy and stopping rumination (Shadinger et al., 2019; Kim et al., 2021).

For example, during a coaching meeting, a student might remind themselves that feedback is meant to improve their work and that they are capable of solving the challenge. Such self-affirming inner dialogue can lower the student's anxiety and help maintain focus on problem-solving rather than on fear and self-doubt.

Insights for design

According to psychological research, individuals often fall into anxiety because they hold negative perceptions about the problems they encounter, yet they are typically unaware of their negative thinking habits. The lack of self-awareness prevents them from getting out from the spiral of anxiety.

However, by **consciously shifting one's perception toward a more positive or constructive perspective, anxiety can be significantly alleviated**. The mindset a person adopts greatly influences how they interpret and respond to challenges or setbacks in real life. A resilient person tends to think positively, seeing difficulties as opportunities for growth, while someone who tends to think negatively is more easily trapped in persistent negative emotions.

So a design direction could be: To help students cultivate a positive mindset and get aware of the negative thinking patterns behind anxiety.



Figure 2.9: Conflict concept. Adapted from Psycom (n.d.).

2.2

TO BE A RESILIENT DESIGNER

This section investigated the unique anxiety that the designer faced compared with other subjects. Based on resilient designers' principles, some methods and mindsets designers can adopt to deal with those anxieties.



Designers' anxiety

Design students often experience particular types of anxiety because of the nature of the subject, which is inherently open-ended, non-linear, and necessarily exploratory and experimental (Roozenburg and Eekels, 1998). The design assignments are tied to iterative processes, ambiguous problems, and the subjective evaluation of creativity and

novelty. This leads to "designer anxiety", which manifests in common scenarios such as fear of negative critique, pressure to continuously come up with creative ideas, or getting lost in project ambiguity. Here I summarised and categorised the typical design students' anxiety with exemplified scenarios from 3 aspects (*Figure 2.10*):

During the design process,
what type of anxiety do they meet?

Anxiety category	situations / scenarios
Fear of judgement, criticism and rejection	<ul style="list-style-type: none"> Having to present a project outcome that you need another iteration Feel unconfident of their work and don't seek for suggestions Fear of other's judgement on their work Not being proud of your project outcome, feeling embarrassed
Stuck in the design process	<ul style="list-style-type: none"> Paralysis in the design process due to lack of confidence Not knowing what to do next in the project
Trapped in perfectionism	<ul style="list-style-type: none"> Always think that the design must be perfect. Self-blaming on the details that they're not considered. Having to present a project outcome that you need another iteration
Team collaborations	<ul style="list-style-type: none"> Having to work on projects that create interpersonal conflict with team members Have conflict viewpoints with group members
Creative anxiety	<ul style="list-style-type: none"> Feel insecurity in brainstorm sessions, especially in a group work Feel unconfident on their creativity ability

As a designer,
what types of anxiety do they have?

Anxiety category	situations / scenarios
Uncertainty of the future / goal	<ul style="list-style-type: none"> They don't know about their purpose or motivation of doing design Feel lost on their future career and job. Feeling like you don't fit in anywhere
Fear of leaving comfort zone	<ul style="list-style-type: none"> Speak at a conference; Presentation; Facilitating a meeting or a workshop; Saying yes to leading a new project; Afraid of saying "no" to others
Worry on academic performance	<ul style="list-style-type: none"> Fear of failing a course then losing scholarships Desire to excel the high performance Link performance to the definition of success (due to performance culture)
Pressure from comparison	<ul style="list-style-type: none"> Compared themselves with others due to performance culture Unwilling to reach out to others for help Unwilling to support your peer
Lack of confidence in personal ability	<ul style="list-style-type: none"> Feel unconfident about themselves in some abilities. Like leadership, design ability Thoughts of imposter syndrome

For external factors,
what type of anxiety do they face?

Anxiety category	situations / scenarios
Influenced by collaboration environment	<ul style="list-style-type: none"> Facing conflicts with group members Having conflict views with stakeholders Working with unethical clients but need to work
Influenced by social environment	<ul style="list-style-type: none"> Not seeing good and just ideas realised in society Coping with the pressure to create positive impact Feel incapable/paralysed of solving complex problems

Figure 2.10: Main design anxiety & scenario examples

Typical designers' anxiety

The main anxieties for design students can be clustered and summarised as the following 9 main categories (*Figure 2.11*). The anxiety and its reason will be further dived into in the user research phase.



Figure 2.11: Typical design anxieties faced by design students

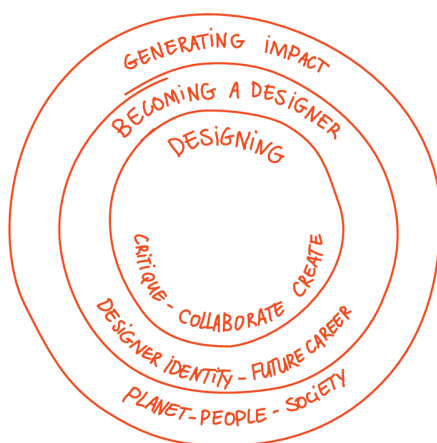


Figure 2.12: 3 layers of resilience (*Resilient Designers Handbook*).

Principles for resilient designers

The research of Resilient Designers (Price & Bijl-Brouwer, 2023) identified three layers of designer resilience (*Figure 2.12*). The first is the layer of designing, where we shift from problem framing to possible solutions. The second is the layer of becoming a designer as an ongoing transformative learning process. The third layer is generating impact throughout our careers and studies as the outputs of our projects, processes, interactions, studies, and activities. In the final outcome, 10 principles are clustered and converged that describe and inspire designers to achieve resilience (*Figure 2.13*).

10 principles for resilient designers

1. The resilient designer might be lost now but knows every day and project is a step closer to finding their purpose. Many of our students cannot articulate their direction and destination. Rather, they are on a journey of self-discovery, and we must coach/teach/supervise accordingly.

2. The resilient designer takes decisive action to follow their purpose. If a purpose is known, the resilient design is decisive to go beyond their comfort zone, even if that means creating chaos;

3. The resilient designer is authentic to their identity and purpose. Embedded in this principle is a strong sense of ethics. This principle calls the designer to stand boldly for their identity, even if that means being unpopular or contrarian;

4. The resilient designer fuels their appetite to change the world with both hope and despair. With a strong sense of empathy, it is acceptable that designers can feel despair at the injustices they see and wish to address. Hope provides the spark that converts us to action. There can be a better way, always;

5. The resilient designer shares unfinished and unpolished work. It is remarkable how young designers will hide their work for fear of rejection and criticism. This is counterproductive to the co-creative spirit of design and truly detrimental to deeper-level learning in HE.

6. The resilient designer is reflexive to performance culture. A performance culture can help us grow, but we must be reflexive to disconnect in order to prioritise our own authenticity and purpose.

7. The resilient designer actively forms the environment in which they receive feedback. When trying to pioneer systemic reform or drive radical innovation, one can expect a degree of resistance to change as people hold onto the status quo. The resilient designer takes care to construct the environment in which they will share work and thus receive feedback;

8. The resilient designer trusts and drives their process. We observe and find throughout our research that students often aim for 'perfection'. However, we know in design that perfection is an illusion. Rather, designers work to satisfy a combination of constraints toward outcomes that are valuable, desirable, just, feasible, sustainable and viable. This synthesis is already difficult enough!

9. The resilient designer views that 'stakeholder alignment' is temporary and that true pluralism and democratic dialogue mean allowing diversity and therefore inclusion to drive value creation. The more we open up our design process to new stakeholders and perspectives, the more difficult it becomes to reconcile these differences into a 'solution' that creates value for the many, not the few. Inclusive design takes time and can feel especially messy.

10. The resilient designer actively shapes communities around them for collective support. The resilient designer is actively developing a community of like-minded peers who are seeking to design for impact. Driving this community means contributing generously to the success of others. When the time comes to call for help from peers, the resilient designer is open to showing their vulnerability and seeking help from peers.

The detailed explanations can be found on the website: <https://resilientdesigners.com/>.

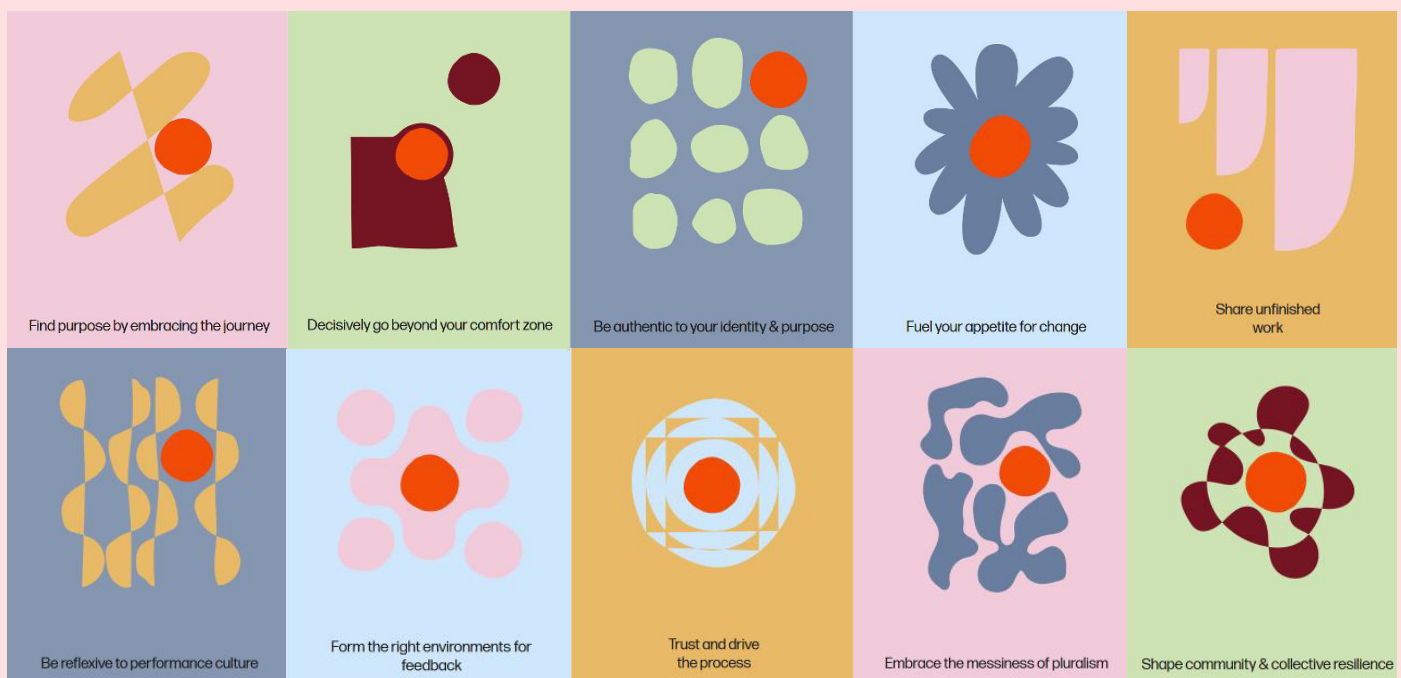


Figure 2.13: Homepage hero image from Resilient Designers (n.d.).

2.3

STORYTELLING AS AN APPROACH TO DEVELOP RESILIENCE

According to the appraisal theory and cognitive-behavioural model, the way of perceiving the situations plays a central role in shaping emotional responses. Negative thoughts are easily activated and can trigger anxiety. One effective way to cope with this situation is by articulating these thoughts, either “writing them down” or “talking them out” to someone else. This process, called storytelling, or narrative, can be understood as a form of cognitive–emotional integration, which is essential for cultivating long-term resilience.

Existing literature further supports this, highlighting storytelling as both a reflective and therapeutic practice that enables one to reinterpret the experience to another perspectives in order to reduce the negative feelings.



Figure 2.14: Storytelling elements in film (Spiralytics, n.d.).

The benefits

Storytelling or narrative, is fundamental to how we think and make meaning of the world. Whether we realise it or not, stories are at the centre of everything we do. How we tell our stories controls our mood and self-image and dictates our future paths and successes. Therefore, understanding storytelling is not only key to how we feel about ourselves, but it also gives us valuable tools we can use to make change (Rutledge, 2016).

According to East et al. (2010), **storytelling offers a therapeutic outlet that helps individuals express inner struggles and build personal resilience.** When practised in supportive environments, it allows people to feel heard, validated, and more connected. This is particularly relevant for students who often navigate high-pressure environments.

Recent studies in digital health agree with this view. Andrews et al. (2023) emphasise that narrative-based strategies in self-help tools, such as journaling or guided dialogue, help users become more aware of unhealthy thinking patterns and develop a more resilient mindset.

Figure 2.15: Magical power of Corporate storytelling (Website Magazine, n.d.).



Ways of storytelling

Here are some ways to implement this method:

1 Journaling and Expressive Writing

Writing down daily experiences, emotions, or specific challenges in a narrative form helps individuals express worries and reflect on them.

e.g., students writing a “stress diary” can reframe anxious thoughts into learning experiences, which makes them feel more in control.

2 Creative Storytelling (Metaphors & Visuals)

Some people turn their challenges into metaphors or visualise them with drawings. These creative forms make abstract emotions easier to process and communicate.

e.g., one feels like “Writing my thesis is like climbing a mountain” or drawing this thesis journey with visuals.

3 Narrative Re-authoring

A technique where someone rewrites a negative event into a growth-oriented story.

e.g., instead of “I failed my presentation”, a student reframes it as “That was a rehearsal that taught me how to explain my concept better.”

4 Digital Storytelling (Audio/Video blogs)

This includes blogs, podcasts, or short video diaries where one tells their own story to an imagined audience. This helps them to externalise emotions and gives the speaker a sense of being witnessed, even if it's private (Robin, 2016).

e.g., students record their design process videos and share their feelings about this moment.

2.4

AI CHATBOTS FOR MENTAL HEALTH

Having identified the psychological foundations of anxiety and resilience, as well as the unique challenges faced by design students, it becomes clear that a practical intervention is needed to translate these insights into action. The aim is not only to reduce the anxiety but also to cultivate resilient thinking when they face the challenges in the future study.

To bridge these two dimensions, this project chose the AI chatbot as the tool, as it has shown promising outcomes in mental health contexts.

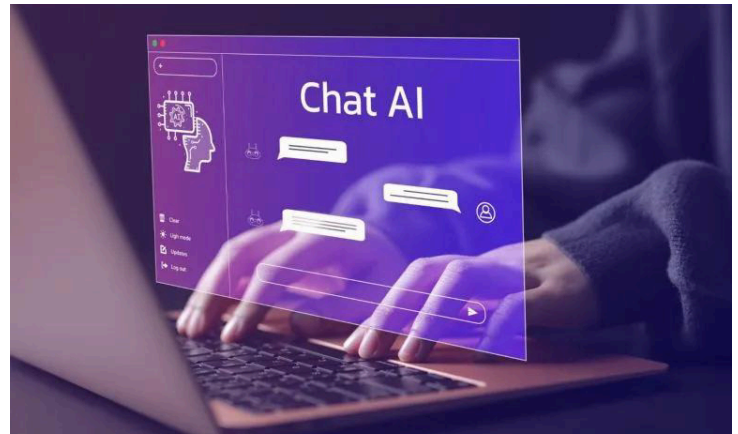


Figure 2.16: Example of an AI chatbot case (OECD, 2025)

AI chatbot in mental therapy

Digital technology has opened new opportunities for mental health support. Conversational AI, such as chatbots, is widely used in delivering mental therapy. It simulates a conversational partner, often through text-based chat or voice, and can be designed to guide users in discussing their feelings, reflecting, and teaching coping skills.

Recent studies demonstrate the potential benefits of AI chatbots in improving mental and emotional well-being, addressing specific mental health conditions, and facilitating behaviour change. Chatbots have shown promise in reducing symptoms of depression and anxiety (Casu et al., 2024).

One of the earliest successful examples is Woebot, a chatbot that uses principles of CBT to help users challenge negative thoughts. In clinical trials, Woebot was shown to significantly reduce symptoms of depression and anxiety in young adults after just a few weeks of use. Similarly, Wysa, another AI chatbot, has been used worldwide. Studies during the COVID-19 pandemic found it could substantially decrease self-reported anxiety and depression among its users. As mentioned, Tess is a chatbot that was tested with college students, leading to measurable reductions in anxiety symptoms over an 8-week period (Chin et al., 2023). These outcomes are promising: they indicate that well-designed conversational agents can not only engage users but also actually deliver benefits comparable in some cases to traditional therapeutic approaches (at least for mild to moderate issues).

AI as a reflective tool

Healing after painful experiences can begin when our voices and stories are listened to and heard (Leseho and Block 2005). In the context of anxiety in design practice, the AI chatbot can provide a way of being listened to by offering a private, safe space to share personal feelings that students might not like to share in an open class.

For a design student, a tailored conversational AI might, for instance, pop up in the chat and ask, "How was today for your project?" If the student is anxious about an upcoming presentation, the chatbot could lead them through a mental therapy exercise: "What's worrying you the most about it?" It might also incorporate positive psychology: "Can you think about a success you had in the past or something you're proud of in your project?" By prompting the reflection process, the chatbot facilitates a form of self-narrating about their problems and anxiety in design practice.



Figure 2.17: Self-reflection (Adapted) (Vox, 2023).

Advantages and risks

For addressing anxiety and building resilience in design students, a conversational AI is particularly attractive because it aligns well with the need for ongoing reflection through design study. Rather than a one-time workshop or a self-reflection booklet, a chatbot can be a design buddy or emotional advisor, accessible whenever a student faces an anxious moment. Also, with the prompt added preliminarily, it can help students to identify possible cognitive mistakes and give personalised coping strategies.

Advantages

AI chatbots offer several advantages over traditional mental health services, including increased accessibility, anonymity, and cost-effectiveness in the era of LLMs (Large Language Models). It can be on call anytime when no human support is accessible. This does not replace human support—rather, it supplements it, filling in the gaps and encouraging students to engage in healthy behaviours on a daily basis.



Risks

At the same time, it is important to acknowledge the risks and limitations. Ethical risks include concerns about **data**

privacy and surveillance. Since chatbots collect sensitive emotional disclosures, breaches or unclear data policies may discourage honest use and decrease trust (Casu et al., 2024). Moreover, **algorithmic bias** can lead to stigmatizing or insensitive responses for certain groups, as studies show AI-based mental health systems sometimes reproduce discriminatory patterns (Haber et al., 2025). The **lack of transparency** also causes what researchers call “trust boundary problems”, where students may not know whether they are interacting with an AI or how their data is used.

Psychological risks are equally critical. Virtual relationships, where users bond with chatbots, leading to **dependency worries on non-human agent** (Casu et al., 2024) which may reduce students’ initiative to seek peer or professional support, potentially reinforcing social isolation (Pavlopoulos et al., 2024). Chatbots also **lack nuanced emotional intelligence**: they may misinterpret subtle cues of distress, or offer generic responses that frustrate users and exacerbate anxiety (Yoo et al., 2025). More seriously, there are cases where AI chatbots responded in unsafe ways—for example, offering factual information to suicidal queries instead of crisis intervention, which could worsen the risk of harm (Casu et al., 2024).

Thus, the scope of chatbot interventions must be carefully defined. They can be a good therapy tool for mild to moderate anxiety and for building habits, but they are not well-equipped to handle crises and should ideally recognise when a situation is beyond their capability, providing emergency resources.

Summary: Why AI in this project?

The trajectory of current research is optimistic about AI chatbots as a promising mental health intervention. In the context of design education, no literature (to the author’s knowledge) specifically addresses a design-targeted chatbot, which underscores the novelty of this project.

By synthesising what is known about designers’ anxiety, design resilience, storytelling and AI in mental health, it shows a clear potential: **an AI chatbot could become a personalised “emotional coach” for design students**, helping them **deal with anxiety**, regulate the emotions, reframe unhelpful thinking, and **build mental resilience**. This aligns perfectly with the Resilient Designer philosophy, essentially providing a pragmatic tool to implement the principles that researchers advocate.



Figure 2.18: Self-reflection painting (Inner Space Therapy, n.d.).

2.5

SYNTHESIS OF RESEARCH RESULTS

In this literature study, I have examined the multiple anxieties faced by design students and the psychological approaches for addressing them. Several key insights emerge:

Design students face unique anxiety

Due to the nature of the design process, which can trigger a set of anxieties, it potentially impacts students' creativity and well-being. As the designer, we are often asked to care and design for others' well-being, but our own mental well-being has often been overlooked, indicating a need for intentional support.

Resilience is a crucial trait for designers

A resilient designer turns challenges into learning opportunities. The research of the Resilient Designer provides a framework of principles to integrate well-being into design practice and education. The purpose is helping students build an adaptive capacity, understanding that anxiety and setbacks in the design process are normal and can fuel personal growth if approached with the right mindset.

Psychology offers perspectives of understanding anxiety and strategies to build resilience

Cognitive behavioural therapy provides techniques to identify negative thought patterns and reframe them, which can apply to how students interpret designers' anxiety. Positive psychology proposes approaches like gratitude diaries and strength-based reflection that can bolster a student's positive mindset and enhance resilience. Both emphasise the value of cognitive reframing and positive thinking to deal with the anxiety and setbacks, which are highly relevant to our mental well-being.

Conversational AI is a promising tool to deliver mental therapy

An AI chatbot can combine these insights in a practical, insightful, and engaging mental therapy tool. For design students, a chatbot could serve as a design buddy or an emotional advisor, providing psychotherapy or counselling during their design practice. It leverages the privacy, personalisation, and accessibility that chatbots afford to complement human support systems.

In essence, the literature suggests that by **applying the research outcomes about designers' anxiety and building design resilience to real-life problems**, we can better support design students' mental health. The design opportunity of using an AI chatbot to help students deal with anxiety is grounded in the convergence of these findings. The next phases of the thesis (Chapter 3 & 4 & 5) will build on this foundation, ensuring that the solution is validated by real user needs and context.

2.6

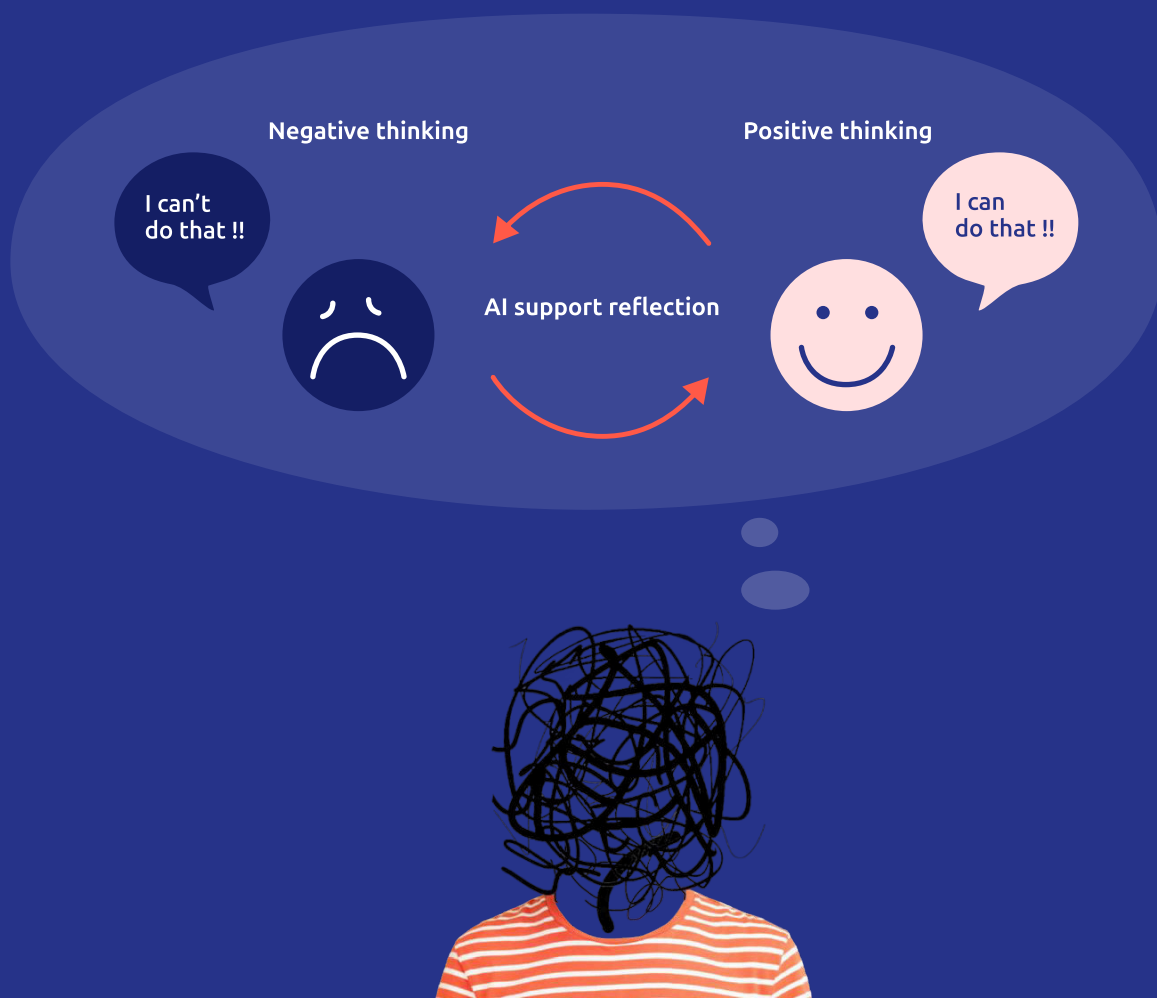
FORMING THE INITIAL DESIGN GOAL

The psychological perspective highlights how positive self-perceptions or appraisals can help mitigate anxiety. By engaging in the reflection process, people can identify the underlying thinking patterns contributing to their anxiety, thereby fostering mental resilience.

THE INITIAL DESIGN GOAL

Develop an **AI chatbot** that supports design students in reflecting upon the **thinking patterns underlying their anxiety**, thereby **enhancing** their **self-awareness** and encouraging a shift toward a **positive mindset**.

The way we perceive anxiety...





Chapter 3

User Research

- 3.1 User interview
- 3.2 Research findings
- 3.3 User journey mapping
- 3.4 Conclusion

Introduction

This chapter presents the contextual research to further dive into the anxiety experienced by design students during the study in order to know how to design an AI chatbot. By employing a combination of semi-structured interviews and experimental reflections, the results uncover insights into the deep reasons behind designers' anxiety and their preferences for AI-based interventions. The findings also indicated the potential need of design students' long-term mental well-being, which will serve as the foundation of a new design goal in the next chapter.

The aim of the user research is to find scenario(s) in which design students experience anxiety and understand their expectations and preferences regarding the use of AI chatbots.

The research is guided to answer the following questions:

RQ2 - Design students' anxiety

- **What scenario(s) to focus on based on literature research on designers' anxiety? How do students experience (think, act, and cope with) anxiety in the scenario(s)?**
- **What are students' expectations from using the AI chatbot?**
- **What's the user journey map in the scenario? What's the interaction opportunity?**

3.1

USER INTERVIEW

Participants overview

The interviews involved 5 industrial design students at the Industrial Design Engineering (IDE) faculty of Delft University of Technology. 3 of them were experiencing anxiety when conducting the interview, and 2 of them didn't have anxiety. In this situation, I asked them to reflect on the anxiety they experienced before in the design context. Participant information is detailed in *Table 3.1*.

Number	Track / degree	Age	If experiencing the anxiety now	How severity	What kind of the anxiety
P1	Dfi / Master	24	No	/	/
P2	Dfi / Master	23	No	/	/
P3	lpd / Master	24	Yes	Mild	Worry on the client meeting
P4	Dfi / Master	23	Yes	Mild	Navigate the conflicts on clients' and supervisors' expectations
P5	Dfi / Master	23	Yes	Mild - Moderate	Feel lost on graduation project

Table 3.1: participants' information

Interview structure

The interview was semi-structured. It contained the main four parts (*Figure 3.1*):

- 1. Open-ended questions** to allow participants to freely discuss their (current) experiences of anxiety during their design studies.
- 2. Reflection on one experience that makes them feel anxious.** Participants completed sensitive materials with my guidance and were asked to verbally articulate their thinking processes, promoting active reflection.
- 3. AI-targeted questions** about their expectations and preferred functionalities of an AI chatbot for reducing and reflecting anxiety.
- 4. Other questions about personal reflection practices,** including what methods they used and emotional reactions associated with reflection. e.g., How do they do a reflection for a course? How do they feel about doing a reflection?

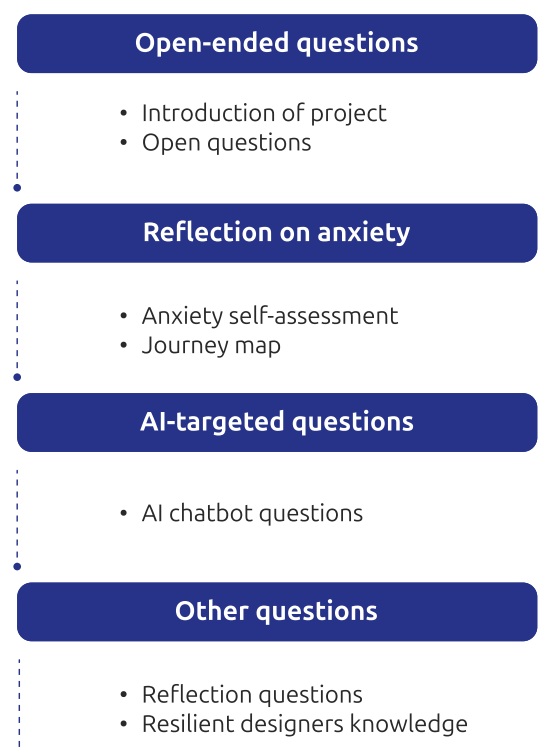


Figure 3.1: Interview structure

The purpose

The interviews were conducted to:

1. **Analyse a natural mental journey of experiencing the anxiety during their design study.** (Why they end in a negative direction?)
2. **Identify intervention opportunities within this natural mental journey**, where the coping strategies, based on psychological study and resilient designers principles, could redirect the journey towards a positive outcome. (How to shift them in a positive direction?)

Initial assumption

Before conducting the interview, I have an initial idea of what the AI chatbot was designed for. It was a reflection tool to help students to get aware of the thinking patterns behind the anxiety. Thus, I had the initial assumption:

When students experience anxiety, a chatbot could help them mitigate and reflect on anxiety by providing positive perspectives of the problems in order to lead them to a positive mindset.

Interview materials (Appendix A)

1. **Anxiety self-assessment survey** (Figure 3.2). This survey is based on the research in Chapter 2, I selected several anxiety for them to evaluate how severity participants experience.
2. **Reflection on anxiety - A journey mapping** (Figure 3.3). Associate one anxiety they have and draw a journey map about how it is processed.
3. **Options for AI functions** (Figure 3.4). Choosing the expectations about AI chatbot's functions and their preference of using AI when they have anxiety.

In the following situations, do you feel any anxiety?
Rate how extent they are from 1(not at all)-5(very anxious)

1	2	3	4	5	Fear of receiving negative feedbacks from others or teachers.
1	2	3	4	5	Stuck on design process due to lack of confidence
1	2	3	4	5	Not satisfied with my design or design ideas
1	2	3	4	5	Not knowing what to do next in the project
1	2	3	4	5	Present unfinished outcome that you think needs iteration
1	2	3	4	5	Feel worried to share my design work
1	2	3	4	5	Worry about the grades and performance
1	2	3	4	5	Lack of confidence in my project outcome
1	2	3	4	5	Feel lost or uncertain about my career
1	2	3	4	5	Feel unconfident about my design skills (brainstorming, group work, facilitating, presenting...)
1	2	3	4	5	Have conflict viewpoints with group members
1	2	3	4	5	Lack of motivation and purpose of doing design
1	2	3	4	5	Feel pressured from your peers
1	2	3	4	5	Feeling that I don't fit in anywhere
1	2	3	4	5	Having imposter syndrome
1	2	3	4	5	Others: _____

Figure 3.2: Anxiety self-assessment survey

Associate and Recall a time / scenario that you experienced with this anxiety.

Scenario: _____ Place: _____ Duration: _____

Scenario stages (if it's applies) _____

How do you feel? _____

How do you act? _____

How do you think? _____

How do you cope with anxiety? (in general) _____

Figure 3.3: Anxiety reflection sheet

If there's a chatbot for you when you feel anxious in this situation. What do you expect from using the tool?

- ☐ suggestion
- ☐ Providing solution
- ☐ listening
- ☐ Emotional supporting
- ☐ reflecting
- ☐ critically saying
- ☐ guiding
- ☐ others: _____

Figure 3.4: AI chatbot's preference



Figure 3.5: Interview pictures

3.2

RESEARCH FINDINGS

This section analysed the user interviews' findings and insights.

Survey: design students' anxiety

The scales were filled by five industrial design students. For each situation, they rated to what extent they experience anxiety from 1 (not at all) to 5 (very anxious), see Appendix B.

The result was calculated on the average of all students' ratings on each situation. The red one in *Figure 3.6* are some situations that are rated relatively higher than others.

Other anxieties (from participants)

- Explaining and reasoning my ideas
- **Deadline anxiety**
- Visual not that pretty
- Not live up to others' expectations
- Groupmates
- Insecure on project quality

**Since I only included 5 participants for the user research, I cannot draw a conclusion, which is the typical anxiety faced by design students.*

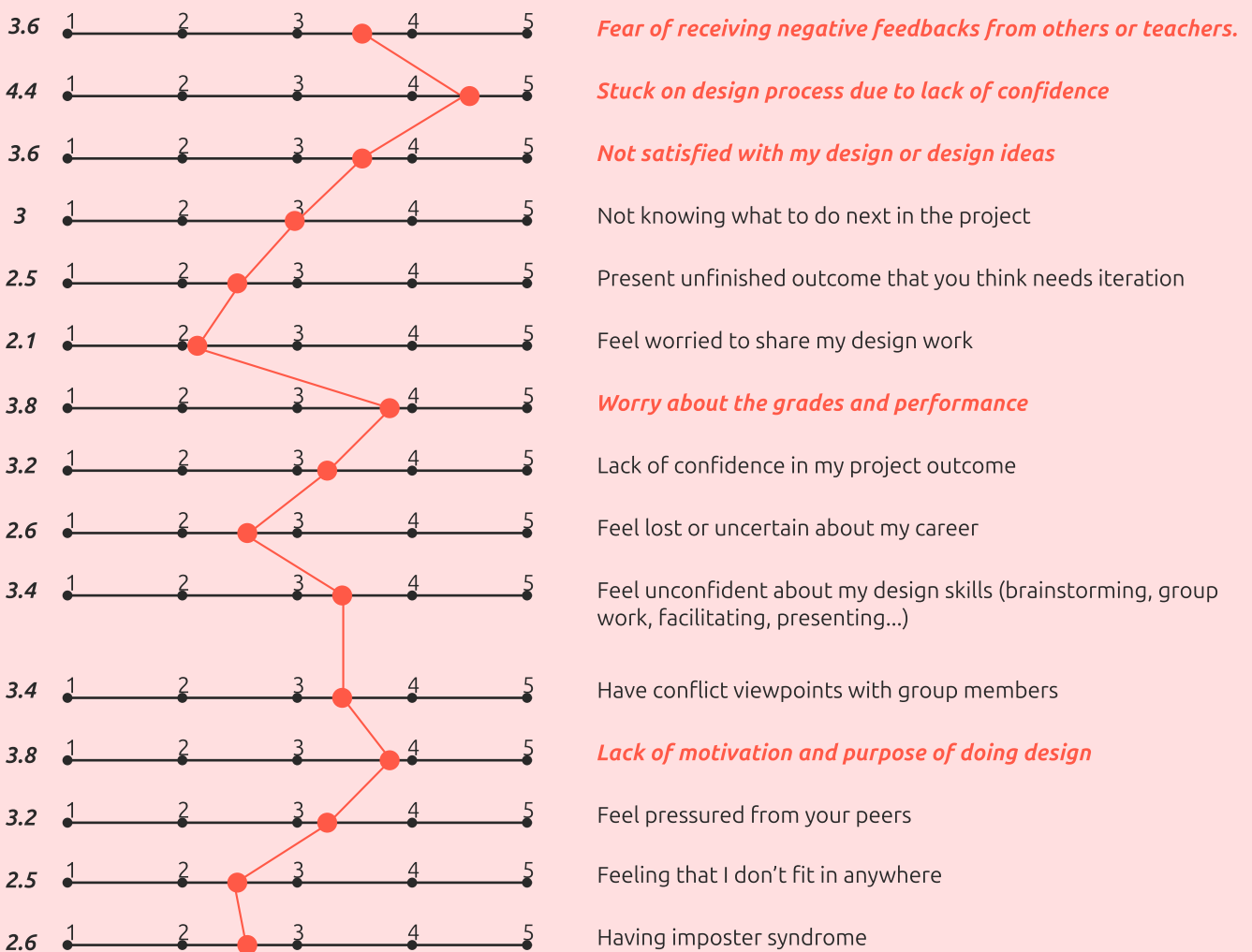


Figure 3.6 Main design anxiety & scenario examples

User expectations of using AI chatbot

During the interview, I provided them with several options to choose what they expected from using a chatbot to manage anxiety. It includes:

- Providing suggestions
- Providing solutions
- Listening to user
- Providing emotional support
- Guiding reflection
- Analysing problems critically
- Others____

The figure shows three instances of a survey form. Each form asks: "If there's a chatbot for you when you feel anxious in this situation, What do you expect from using the tool?". The options are: suggestion, providing solution, listening, emotional supporting, reflecting, critically saying, guiding, and others. The first two forms have handwritten checkmarks and notes. The third form has 'X' marks next to 'suggestion' and 'providing solution', and a checkmark next to 'listening'.

Figure 3.7: Participants' expectations of using AI chatbot (Appendix B)

When to use chatbot & What they expect

Through the research I realised that people have different needs for using the chatbot to manage anxiety in different situations. The results revealed two situations:

Situation 1: Experiencing momentary anxiety

Participants are experiencing intense anxiety. Therefore, immediate relieving strategies are needed. They expressed a clear preference for supportive, empathetic, and solution-orientated AI interactions. Emotional support, practical suggestions, examples of peer solutions, and evidence-based analysis were highlighted as critical functionalities.

Traits and Functions:

- Empathy and non-judgemental tone
- Evidence-based analysis about the problem
- Emotional support
- Providing actionable solutions with examples
- Context-based knowledge related to the problem

Interaction Strategies:

1. Provide immediate anxiety-relieving strategies such as emotional support.
2. Reframing negative thoughts based on the CBT approach
3. Shift emotions in a positive direction
4. Provide solution-oriented recommendations
5. (Optional) Provide resilience-building strategies

Situation 2: One doesn't experience anxiety or experience mild anxiety

For less momentary anxiety or a post-event reflection, students showed willingness to a deeper, more critical self-reflection. AI in this context should facilitate reflective guidance, objective evaluation, and resilience education.

Traits and Functions:

- Objective, and non-judgmental tone
- Analysis of anxiety-causing factors
- Tips for building designers' resilience
- Actionable improvement strategies
- Emotional support as needed

Interaction Strategies:

- Guide critical self-reflection behind anxiety
- Analyse negative or unhelpful thoughts behind anxiety and propose positive reframing and suggestions
- Providing tips on building resilience of the same situation in the next times

3.3

USER JOURNEY MAPPING

During the interview, I asked the participants to recall one anxiety that they experienced before. I didn't limit the scenario to a certain anxiety, because the participants may not experience the same anxiety that I provided. So I left it open to explore more possibilities.

The cases participants wrote in the sheet are (Figure 3.9):

- An individual landscape project (top left)
- An individual design project of one Dfi course (top right)
- A group project of one Dfi course (bottom left)
- Before-during-after the client meeting of one's graduation project (bottom right)

Those cases have something in common: **they suffered from strong anxiety during the process, and the end of the event resulted in relatively negative feelings.**

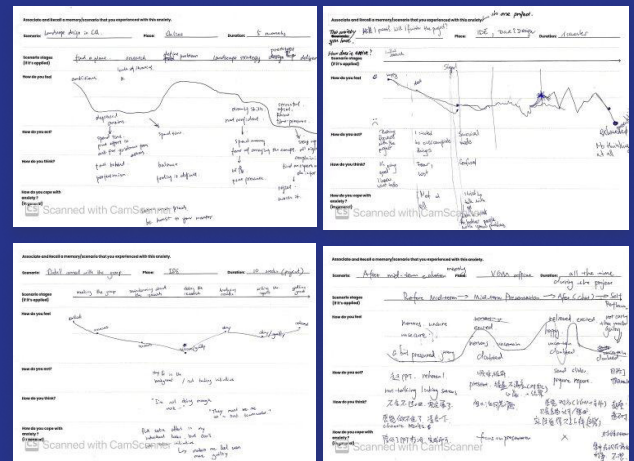


Figure 3.9: Participants' reflections on certain anxiety (Appendix B)

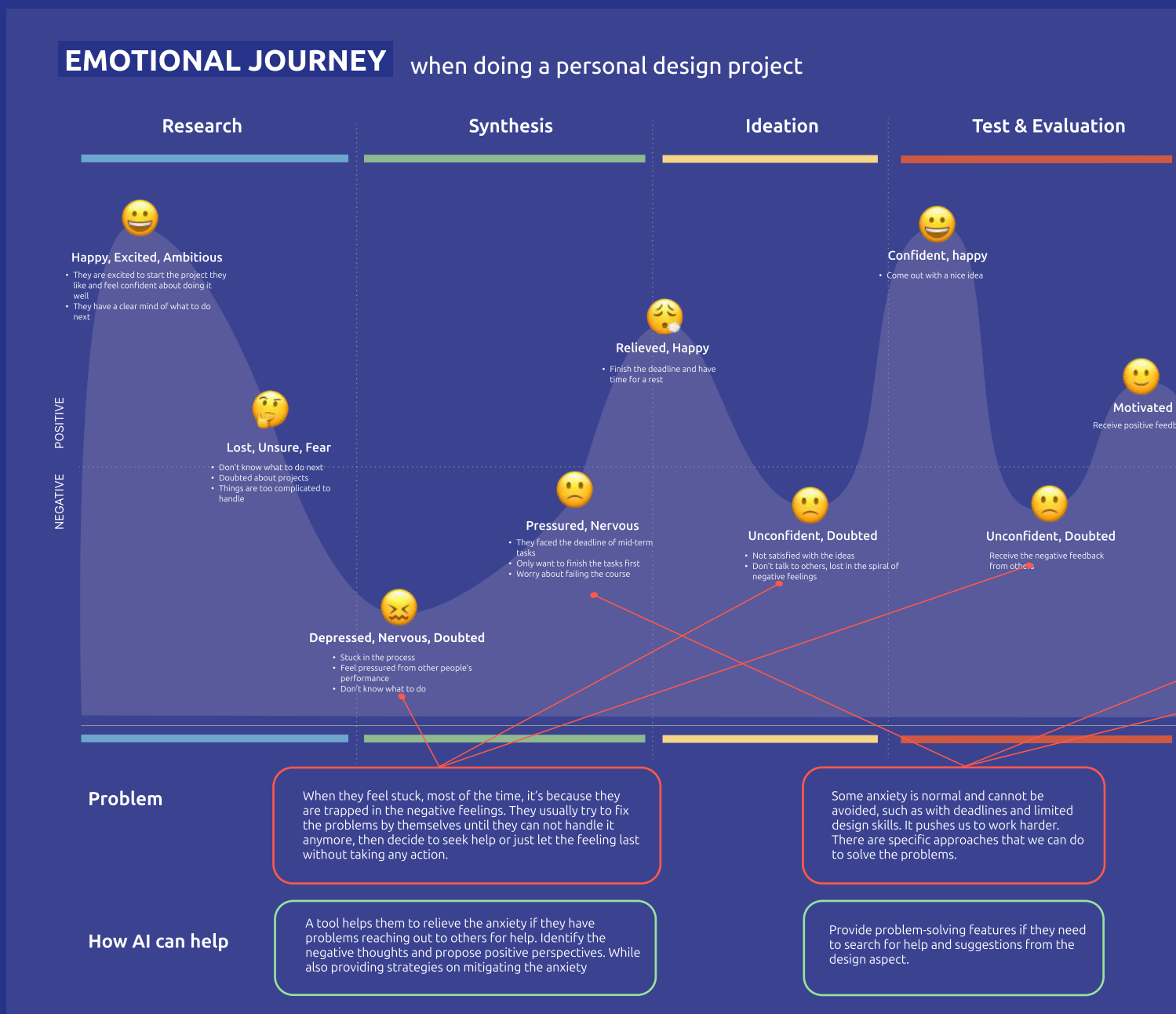


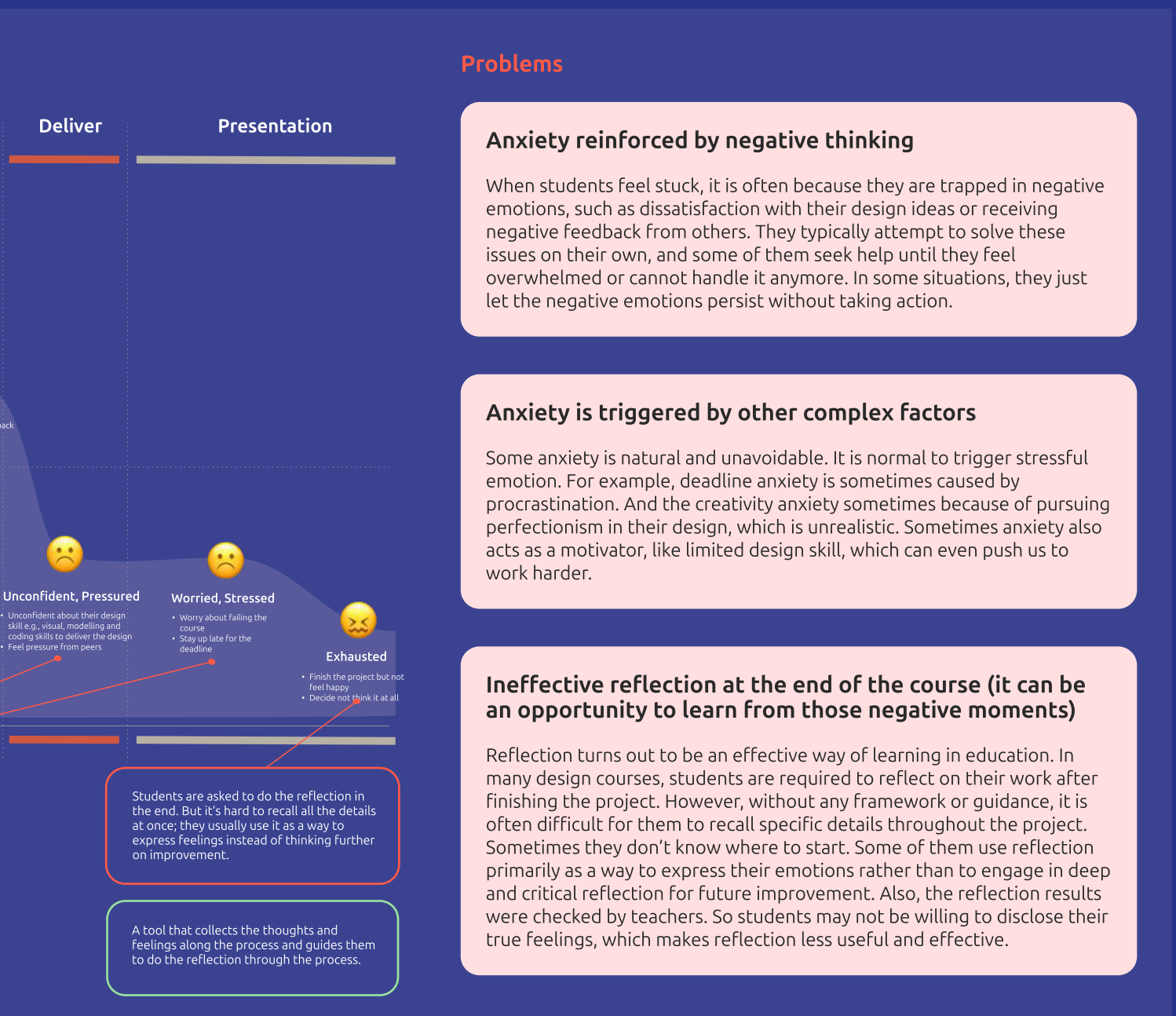
Figure 3.10: A exampled emotional journey of doing a personal design project

Analysis of the journey

Based on the interviews and analysis of students' reflections on their anxiety scenarios, I formulated a mental journey map of completing a personal design project as an example to identify design opportunities (Figure 3.10).

Need to notice that this is just an example of a mental journey based on 5 participants' stories and my personal experience when doing design, which gave overall negative feelings after finishing the project. It cannot represent all the situations of doing a personal design project.

I analysed the user's mental journey throughout the entire process, examining when and why anxiety occurs, and identified where AI could intervene to support them. The analysis revealed insightful findings. Students encounter three primary types of challenges during their project work.



Insights for chatbot interaction

From the interview findings and analysis of emotional journey. The user group expressed different anxiety types and the preferences for using AI to manage anxiety. Thus, not all the traits, functions, and strategies fit for all users. So it's important to always ask users if they need this kind of help or not. Not just give all the information directly without users' permission. Like asking, "Do you want to dive into a reflection exercise?" "Do you need me to lead a breath exercise for you?" This could significantly enhance users' trust of the chatbot.

A proposed chatbot interaction process when users are experiencing anxiety is shown in the following steps (Figure 3.8):

Step 1: At first, the chatbot welcomes the user and checks in with their current feelings and problems. This step is to understand users' feelings and current problems. The chatbot mainly serves as a listening role of collecting problems and showing empathy.

Step 2: AI will help users to break down the problem. This includes guiding users to get aware of how their negative thinking contributes to their anxiety by providing a different / positive perspective of seeing the problems. If there's a solution, it's always good to provide it, which can significantly reduce the anxiety.

Step 3: If the user indicates a better feeling after chatting, the chatbot takes a reflective role, guiding the student to connect their experience with resilience-building principles. If the user still indicates a terrible feeling or even a suicide tendency, the chatbot should proactively advise them to seek professional help.

How the chatbot act during the interaction

When experience anxiety

Scenario background

Before the midterm evaluation, Malaika feels very nervous about presenting the project to the client because she's uncertain if the client likes the idea, and he also feels dissatisfied with her outcome. She is unwilling to talk to people about the situation. So she decided to seek help from the chatbot.

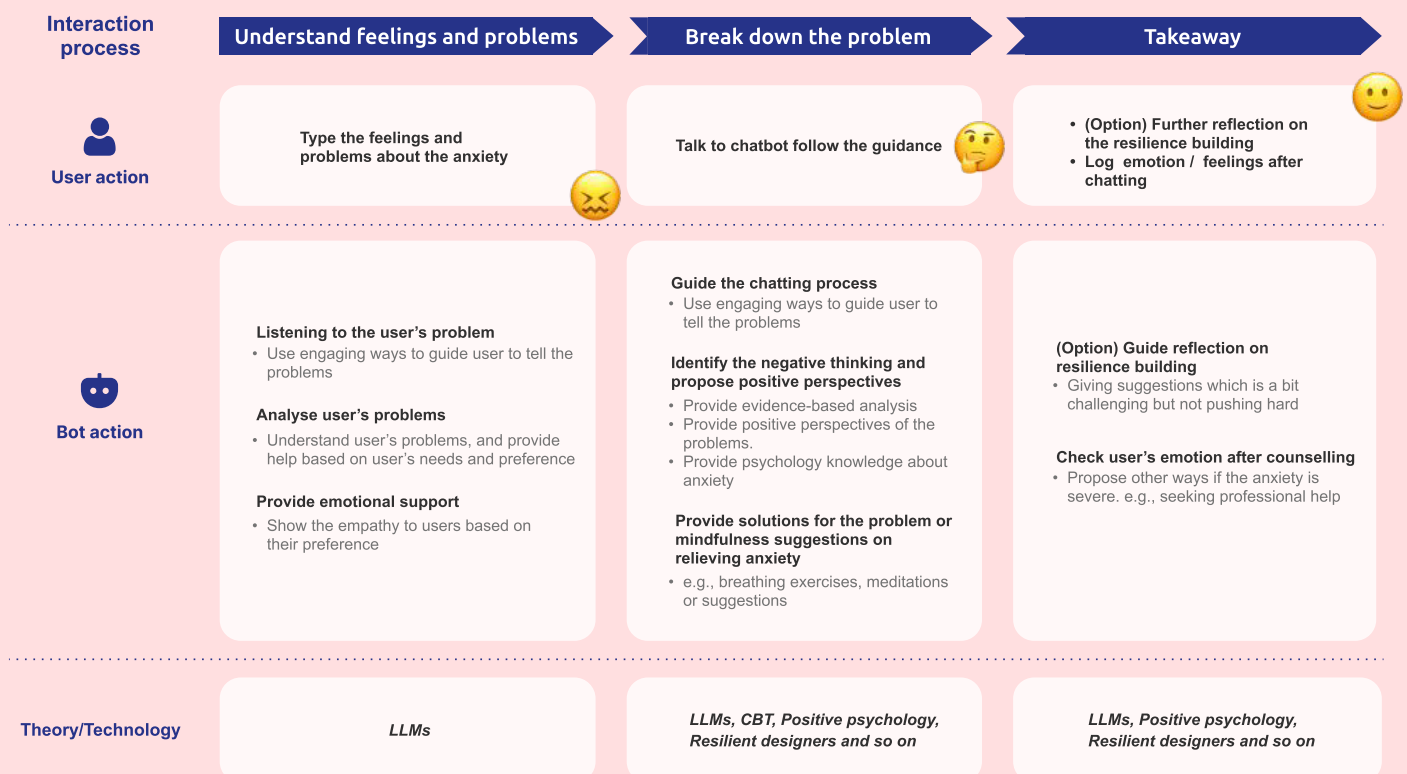


Figure 3.8: How the chatbot act during the interaction

3.4

CONCLUSION

Now, look back on the research questions:

RQ 1: What scenario(s) to focus on based on literature research on design anxiety? How do students experience (think, act, and cope with) anxiety in the scenario(s)?

Based on the interview findings, I didn't find a confirming answer of focusing on a specific scenario(s). There were only 5 participants involved in the process, and they have different types of anxiety.

From the research, here are situations in which they have strong anxiety:

- Receiving negative feedback from others
- Stuck on the design
- Having conflict with group members
- Lack of motivation of doing design
- Worry on performance and grades
- Deadline anxiety

The anxiety can be summarised by three categories:

- 1. Anxiety caused by the nature of design subjects**, like getting stuck in the design process, losing the purpose and striving for perfection of their ideas.
- 2. Anxiety is caused by internal reasons**, like being fragile about receiving negative feedback and worrying about the performance.
- 3. Anxiety is caused by external factors**, like group members and approaching deadlines.

The reasons behind anxiety are quite complex and depend on different situations. But due to the nature of design, it's important to learn that imperfection and failure are the usual and normal parts of design.

The way different people deal with anxiety are also different: some of them tend to actively search from others for solutions and find ways to solve the problems in order to reduce the anxiety. But some people tend to solve their problems by themselves or are not willing to disclose their difficulties to others. So the anxiety could happen along the whole process and even lasted to the end. In this situation, they are easy to trap in negative spirals and feel anxious.

RQ 2: What are students' expectations from using the chatbot?

It depends on two different situations of using the chatbot for managing anxiety:

- 1. In situations of momentary anxiety**, the primary need is emotional relief and offering efficient solutions and strategies. The chatbot's role here is to offer support to mitigate anxiety before any deeper reflection.
- 2. In situations of mild anxiety or when they are out of situations**, the chatbot can play a more proactive and reflective role, guiding students to analyse the underlying causes of their past anxiety, fostering critical reflection to build on resilience and offering constructive strategies.

RQ 3: What's the user journey map in the scenario? What's the interaction opportunity?

Based on the analysis of the mental journey map, it becomes clear that anxiety arises from different reasons. Therefore, the chatbot's role and coping strategies should be adapted according to the context.

The interaction opportunity lies not only during the design process to reduce anxiety but also at the end of the project for a reflection exercise of those emotional struggles.

Those insights served as the foundation of formulating the final design goal in the next chapter.

Chapter 4

Design Goal

Based on the literature review, the initial design goal is to develop a chatbot that helps students become aware of the negative thinking patterns behind their anxiety. These unconscious cognitive distortions often trap students in cycles of self-doubt and emotional distress. From positive psychology views, adopting a positive perspective, both in self-perception and in how problems are interpreted in one's cognition, is recognised as a crucial strategy for managing anxiety.

The initial design problem is therefore formulated as

How can the chatbot help students understand and break down the reasons behind the anxiety and provide a constructive or positive perspective?

However, findings from the user research highlighted that building mental resilience is a long-term process, requiring proactive reflection after situations. This reflective process aims to help students become more resilient and positive when encountering challenges in their future study. Drawing on the Resilient Designers framework, which offers several principles and strategies for building resilience for designers.

The design problem evolves into a broader question:

How can AI leverage the design process to support design students' long-term mental well-being and build resilience?

THE FINAL DESIGN GOAL

Design an AI tool that assists students in coping with momentary anxiety during the design process and guides them to reflect on anxiety moments during the study process in order to build design resilience

1

short-term anxiety coping

A chatbot for mitigating anxiety in real-time when they face design challenge.

2

Long-term resilient building

Continuous reflective prompts and strategies to help students cultivate resilient mindsets for their future design practice.



Chapter 5

Design Development

5.1 Conceptualisation

5.2 Concept decision

5.3 Final design concept

5.4 Design iteration

Introduction

From the last chapter, the research led to the final design goal of designing an AI tool that can help students navigate anxiety and build resilience during the whole design process. It can evolve 2 design direction:

Direction 1: A chatbot

Designing a chatbot for coping and reflecting design anxieties to create their awareness of the thinking habits behind the anxiety.

Direction 2: AI system

Designing an AI system that support students' anxiety during the design process and generate insights by collecting and analysing historical dialogues from the chatbot.

Since those two design directions are interdependent. I did a brainstorm in both directions by myself to see if I could generate more ideas. Then I tested those rough ideas with users and came up with the final concept.

5.1 CONCEPTULISATION

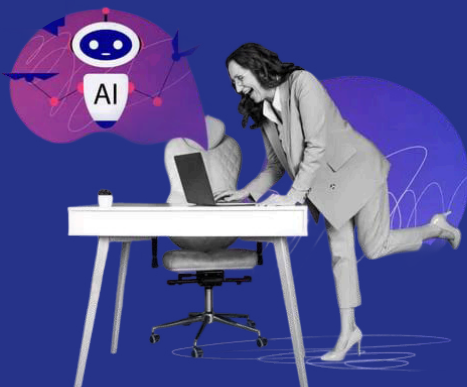
Direction 1 - A chatbot

During the research phase, I already collected a bunch of ideas about designing a chatbot in my mind. Based on all these ideas, I selected some ideas that are most inspiring or interesting and asked for feedback or inspiration.

Here is a list of 10 rough ideas about how to make students be aware of thinking patterns by interacting with a chatbot:

1 Professional designers' counselling bot

Specially for designers, providing counselling based on CBT and typical design anxieties. Also provide the professional knowledge and source for users to understand and reflect behind anxiety



4 Thinking in a stranger's perspective

The chatbot asks users to think of the story of another person with the same situation. Shaping their perception from a first person to a stranger's perspective to see the underlying problem.



2 Metaphor of anxiety

Metaphorise negative thoughts into the monsters. The more we avoid and think negatively, the more powerful that anxiety becomes and the harder it is to control. The way of thinking is the weapon. Let's see how to use thinking that breaks down the enemy!



3 Anti-perfectionism bot

Perfectionism is a significant phenomenon among designers and other creators. Sometimes it's a good thing, but sometimes it brings negative emotions.

- How to use: give conversation to help them recognise the gap between expectations and reality and support them in letting go of perfectionistic thinking.

PERFECTIONISM
TELLS
LIES.



5 Seeing from a different stakeholder's perspective

Users can define the perspective from which they want to view the situation. The chatbot will generate a character aligned with his/her personality and talk to you. For example, if a student feels anxious before a coach meeting, the AI can take on the role of the coach and talk through the issue from their point of view.

6

Talking with two inner person in mind: the negative self and the positive self

(inspired by the animation: Inside Out)

This is a three-person conversation between the negative self, the positive self, and the user. Together they're discussing the problem.

- Negative self (Anxiety) represents inner struggle and shows what truly matters to you.
- Positive self (happiness) encourages you to let go and not be trapped by negative thinking.



7

What's your designer types?



A survey that you can choose how you usually do in different design anxiety scenarios. like a designer MBTI survey. Based on your choices, it will give you an analysis of what type of designer you are. and how you can improve.

8

Letter from the future - talking with future designer

(inspired by Future You (Pataranutaporn et al., 2024))

Talking to the future designer you want to be, it serves as the design mentor to guide you to get out of the pits. Imagine what kind of designer you want to be and AI will simulate the roles.



9

Personalized self-help bot

The chatbot will based on your preference, such as what and how extent do you expect from the chatbot: emotional support, solution providing, further reflection...

10

Talking with positive self

Talking to someone that's always positive helps you see the problem with a positive perspective when you're trapped in the negative thinking.



Direction 2 - An AI system

For design students, it's quite typical to do multiple courses and projects during the study. In order to formulate the functions into a cohesive system, I selected one design project as a whole interaction journey to see how the system could help during the process (Figure 5.1).

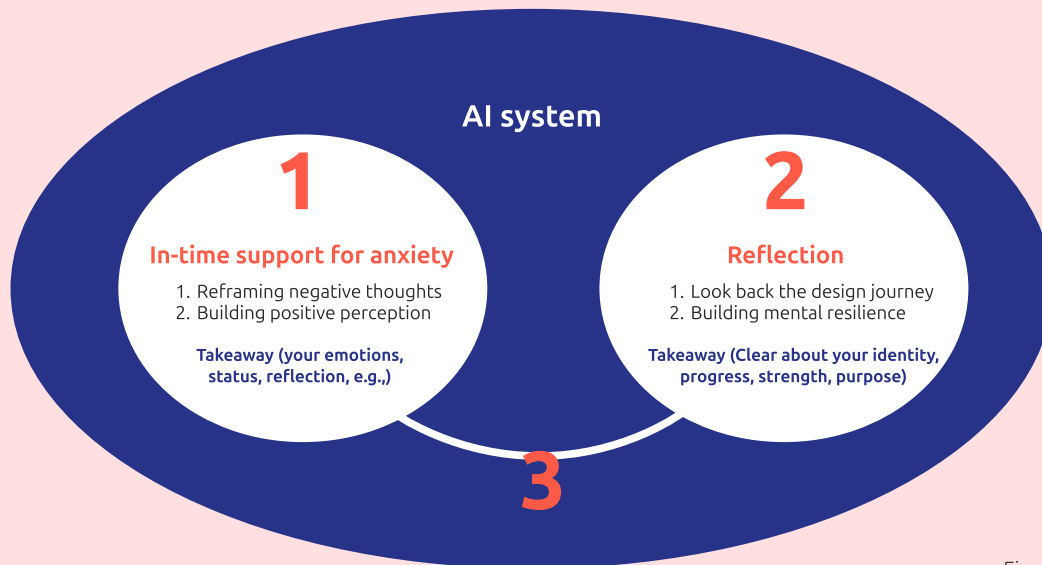
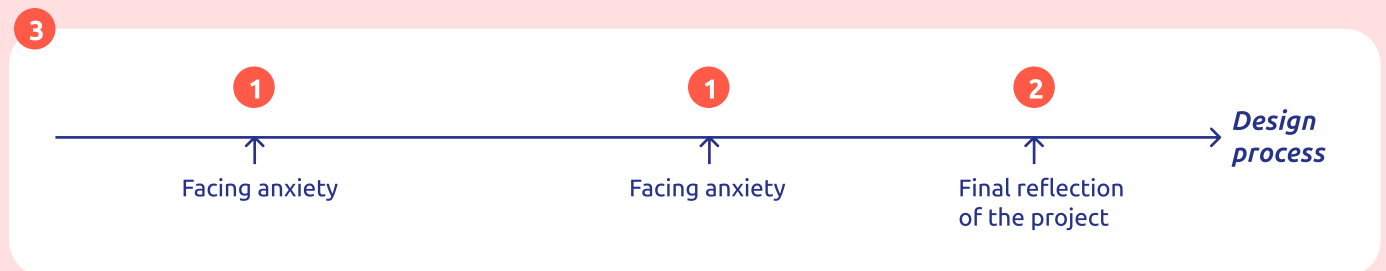


Figure 5.1: AI system idea

How does the system work?



Design considerations

1

- **When to use it?** ---> System initiative it or user initiative
- **How to reduce anxiety?** ---> Reframing negative thoughts, breaking unrealistic thoughts
- **What's the purpose of the results? how it contribute to the system?**

2

- **When do user use the reflection?** --->System initiative it or user initiative
- **Reflection what? How was the interaction process** --->Combine the chatting history to generalize personal prompts,? or new aspects? Based on Resilient designers.
- **What's the purpose of the results, how it contribute to the system?** --->For a course reflection? for further personal development? For over-all mental health?

3

- **How to make the system coherent?** ---> design language, gamification, document the project timeline, guidance companion (tone)
- **What other values can system add?**
- **How does the system working in long-term?**

5.2

CONCEPT DECISION

The design goal is to create an AI tool supporting students' mental health in the long term, especially for helping them with emotional struggles. So some of the ideas on direction 1 are not suitable to integrate into an AI system to support students on a regular basis. I tested those ideas verbally with several design students, they expressed more interest in a long-term mental support tool.

Therefore, based on user feedback and literature study, I made the final concept decision—

Design an AI tool based on chatbots to support design students' emotional moments by providing anxiety coping strategies and help them reflect after their project journey.

More reasons are stated as follows:

Everyone experience different anxiety during the design process

At first, I planned to select a certain anxiety to develop the design and chatbot interactive strategy. Usually, I need to pre-write prompts for each anxiety (like a bot for coping with perfectionism anxiety). It's not universal and excludes some users if they're not going through this anxiety.

Negative thinking is not the only reason that lead to anxiety

Like what I found in the mental journey map, some anxiety is not caused by negative thinking. There are complex reasons behind it. For example, deadline anxiety may be caused by reasons like procrastination or fear of failure; creativity anxiety can be caused by lack of confidence or perfectionism. CBT is the main method for reducing anxiety but not the only approach. Sometimes we need other strategies. So the strategies that the chatbot adopts should be more flexible rather than a fixed structure.

Looking at positive aspects of the design process is also beneficial.

Positive psychology suggests we think about positive perspectives of things. During the design process, it's also meaningful to look at the good aspects of the project. e.g., "Today I feel good about the group collaboration. Why am I feeling good?" This was also indicated by the users that "I want more positive feedback from that system so I can keep on using it." It could increase users' positive perception of themselves, thus increasing the confidence of their project that benefits their mental health.

People sometimes are not aware of they experience anxiety

One user said, "Sometimes I don't know if I am experiencing anxiety, and AI can tell me, which will be helpful." So identifying it in advance is better for them to be aware of the unhelpful thinking that leads to anxiety. AI can help to prevent it from becoming severe.

5.3 FINAL DESIGN CONCEPT

A visualisation of the concept

To understand how this AI system works, I created a typical interaction journey of a certain project (Figure 5.2). During the journey, there are some moments that design students may have anxiety or other emotions (both positive & negative). Those moments can serve as the reflection of the project to build resilience.

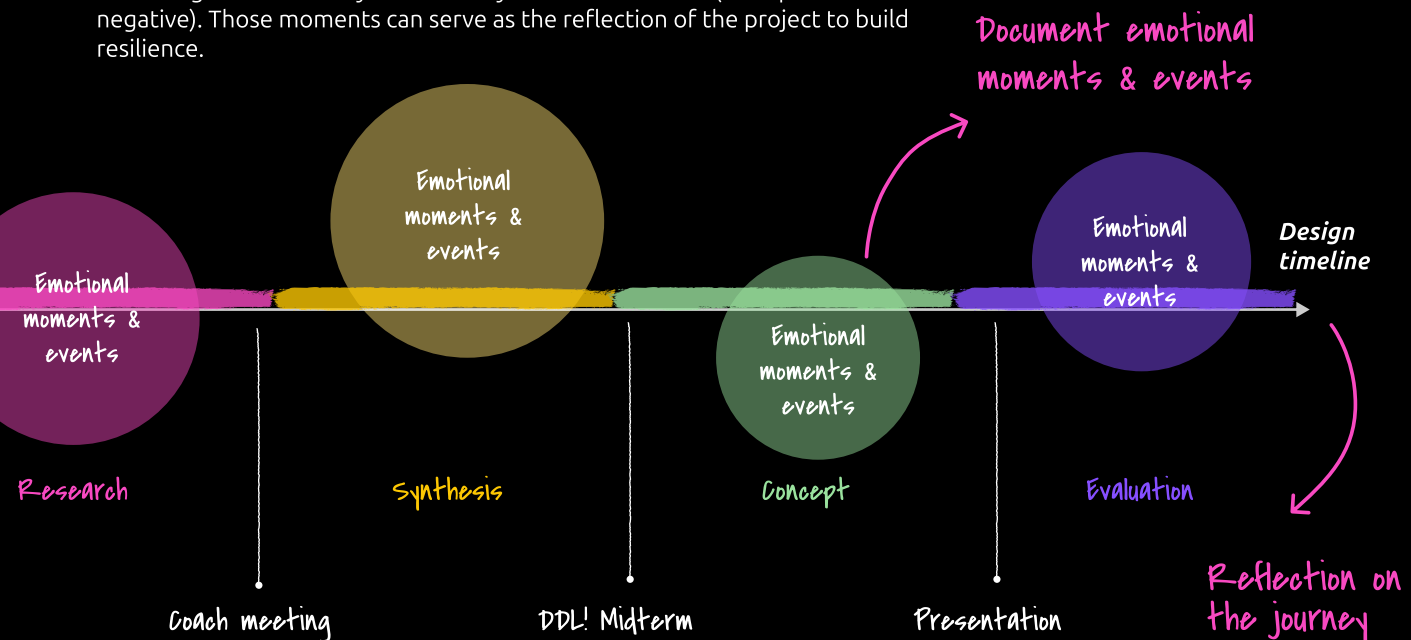


Figure 5.2: The interaction journey

Chatbot strategies of 2 main functions

In different scenarios, AI will give different strategies (Figure 5.3). In the scenarios in which users experience momentary anxiety, AI will provide relevant strategies to reduce anxiety. Aside from reducing anxiety, the reflection is integrated into the process, which helps them nudge towards positive self-perception.

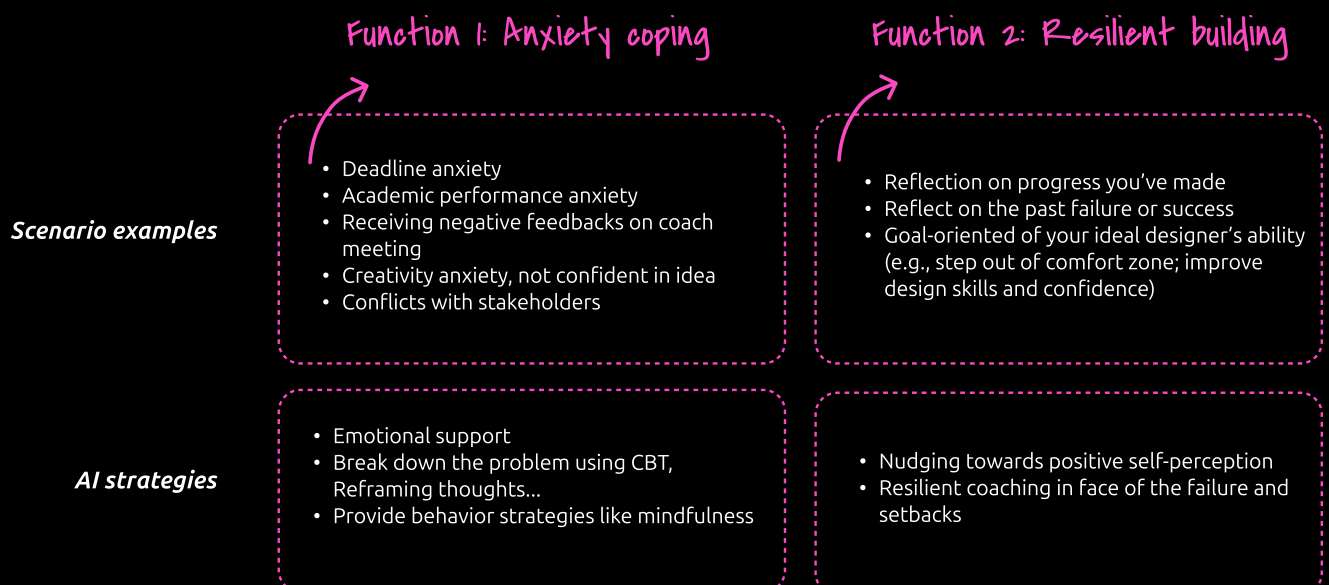


Figure 5.3: AI strategies in different scenarios

Moodboard

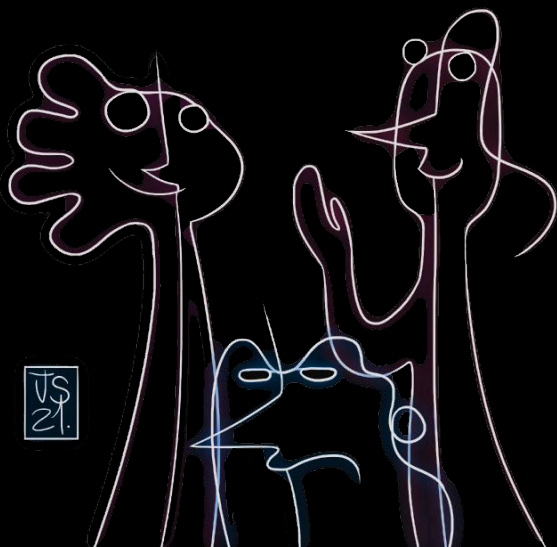
I chose multiple light colours as the visual elements because emotions are various and dynamic. Also, the glowing effect conveys a feeling of hope and the unknown. The inspiration was from two cartoon animations: Inside Out & Soul.



Figure 5.4: Movie, Soul



Figure 5.5: Movie, Inside out 2



Character

In order to make the conversation more attractive, I created an avatar called Lumi to serve as a design buddy, who will lead them in the process.



Hi, I'm Lumi



Role

Lumi is a design buddy and also advisor who has professional mental health knowledge.

Tone

Friendly, empathetic, patient, flexible
(Through the interaction, the character will learn from users to provide personalised conversation)

5.4

DESIGN ITERATION

Based on the concept idea, I started to structure the interfaces. I used the method of “design through testing”, integrating user feedback to improve the interfaces.

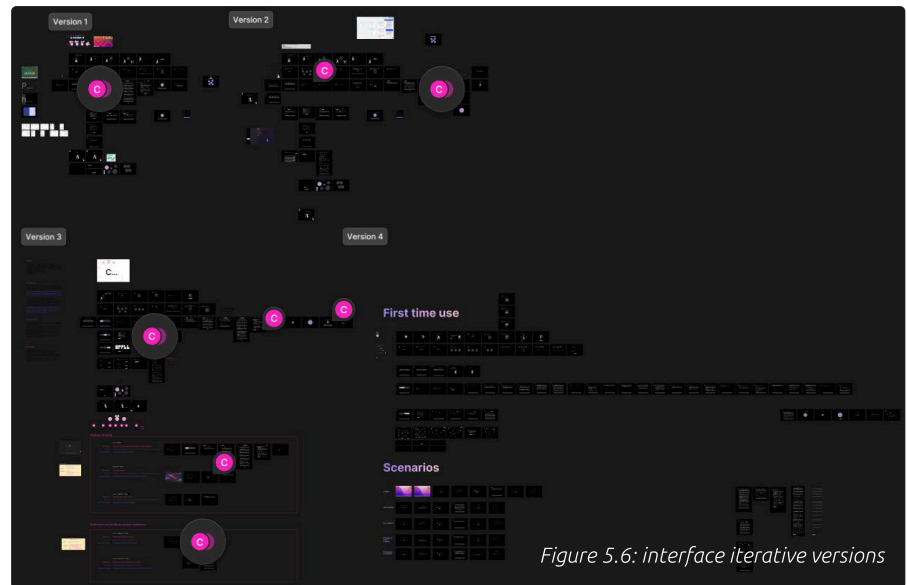


Figure 5.6: interface iterative versions

Key iterations

Limit scope to emotional ups and downs

This is because the scope of the project is for building mental resilience instead of building other professional design skills. The position of this tool should make it clear that it's a mental health support tool so users can easily understand what it's used for.

Make explicit introductions at the beginning

Since it's a mental health support tool for designers, not all students have the need to use this tool. Through the testing, I found people who have the habit of using chatbots regularly for counselling or reflection expressed strong interests in this tool. While some people thought they may not stick to using it unless it can prove the benefits for their design study. So I need to make it attractive and understandable about the benefits this tool can bring to them.

Make the interaction process less heavy

The more complex it is, the less willingness they would have to use it. Because they're looking for immediate support when having the anxiety. So don't put too many functions at the beginning for people to select.

Prompting the chatbot with OpenAI

It is important to note that the chatbot cannot act as a therapist, such as a cognitive behavioural therapist. Substituting professional psychological or medical services, which is explicitly prohibited by OpenAI's use policies. In the prompt, you need to declare that the chatbot is not a professional mental therapist but only provides general support.



Chapter 6

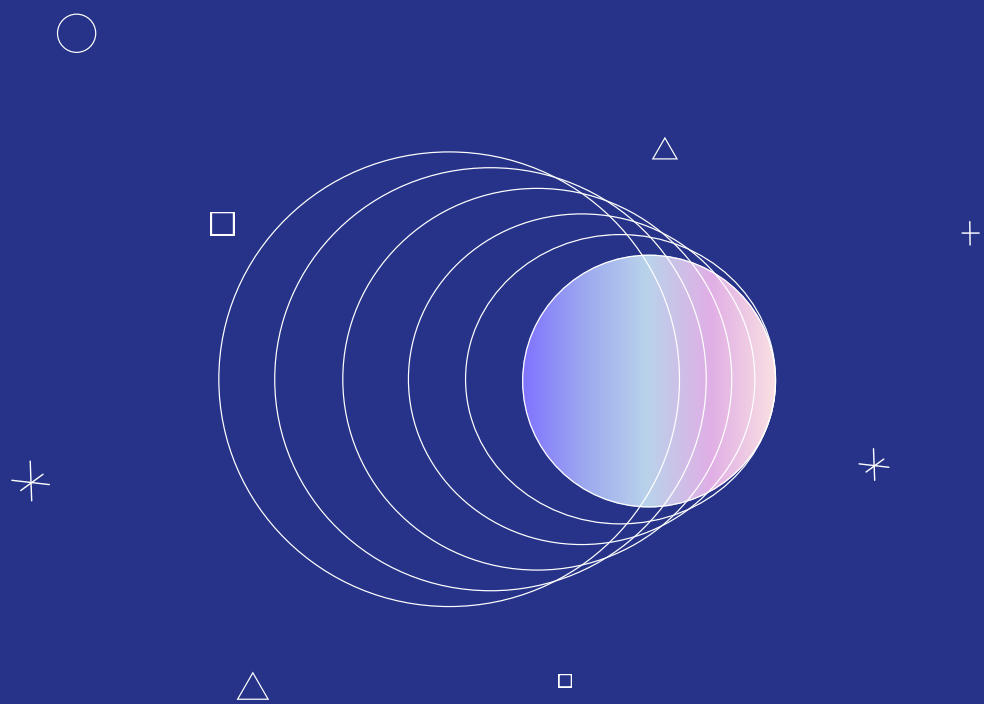
Final Design

6.1 Introduction - Lumi

6.2 Storyboard

6.3 The interface

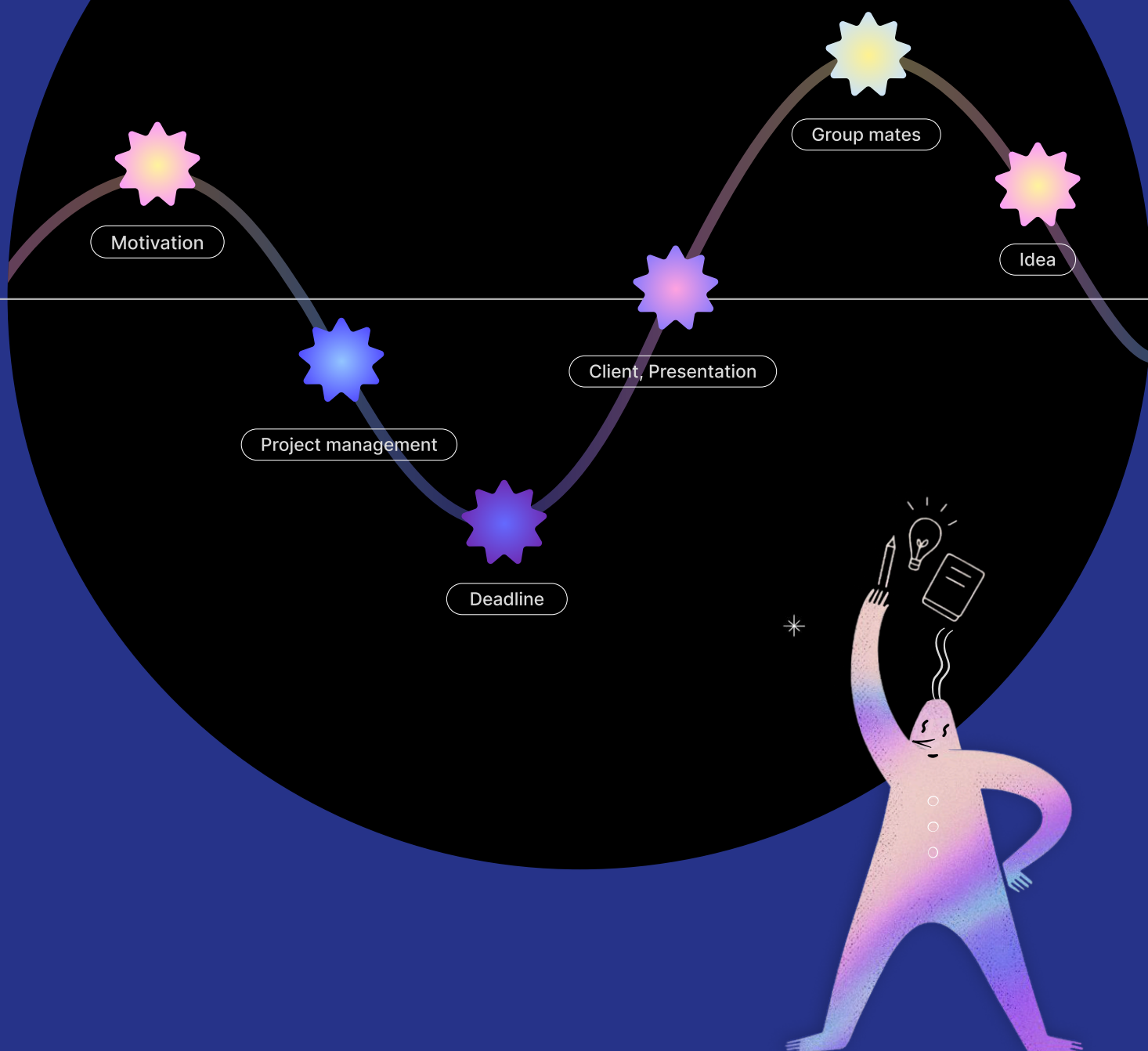
6.4 Connection between concept and literature



6.1 INTRODUCTION

Lumi is a **mental health support tool** designed for design students' mental-wellbeing. It aims to help and coach you on how to **cope with design anxiety** and **generate personal insights** throughout your design study.

LUMI Discover your design journey



Main function - Project feeling logging & Anxiety coping

Step 1 Indicate the current feeling about the project

The slider ranges from terrible, bad, okay, good and excellent, user select according to current states

1

How do you feel about your project right now

Terrible  Excellent

I am feeling bad

Step 2 Choose on what factor(s) trigger the feeling

The factors are categorized for design study context

2

What makes you feel that

Identity Motivation Skill Idea Communication

Project management Design process Decision making


Group mates Coach Stakeholder Client

Deadline Presentation Exam Meeting

3

I feel anxious about my client meeting because I didn't prepare well

Here are tips may help you:

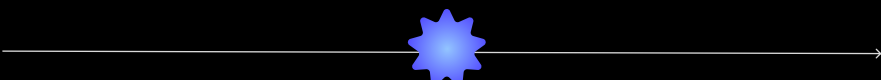
 **Deal With Perfectionism In Design**

The perfectionism in creative industry often have this problem, it can be constructive but sometimes drag us into negative spirals. There will always be room for improvement. First concept doesn't need to be perfect.

Step 3 (Optional) Chat with Lumi about the feeling

If user feel anxious about the project, they can seek help from Lumi and it will provide designer-targeted mental support

4



Client, presentation

Insight

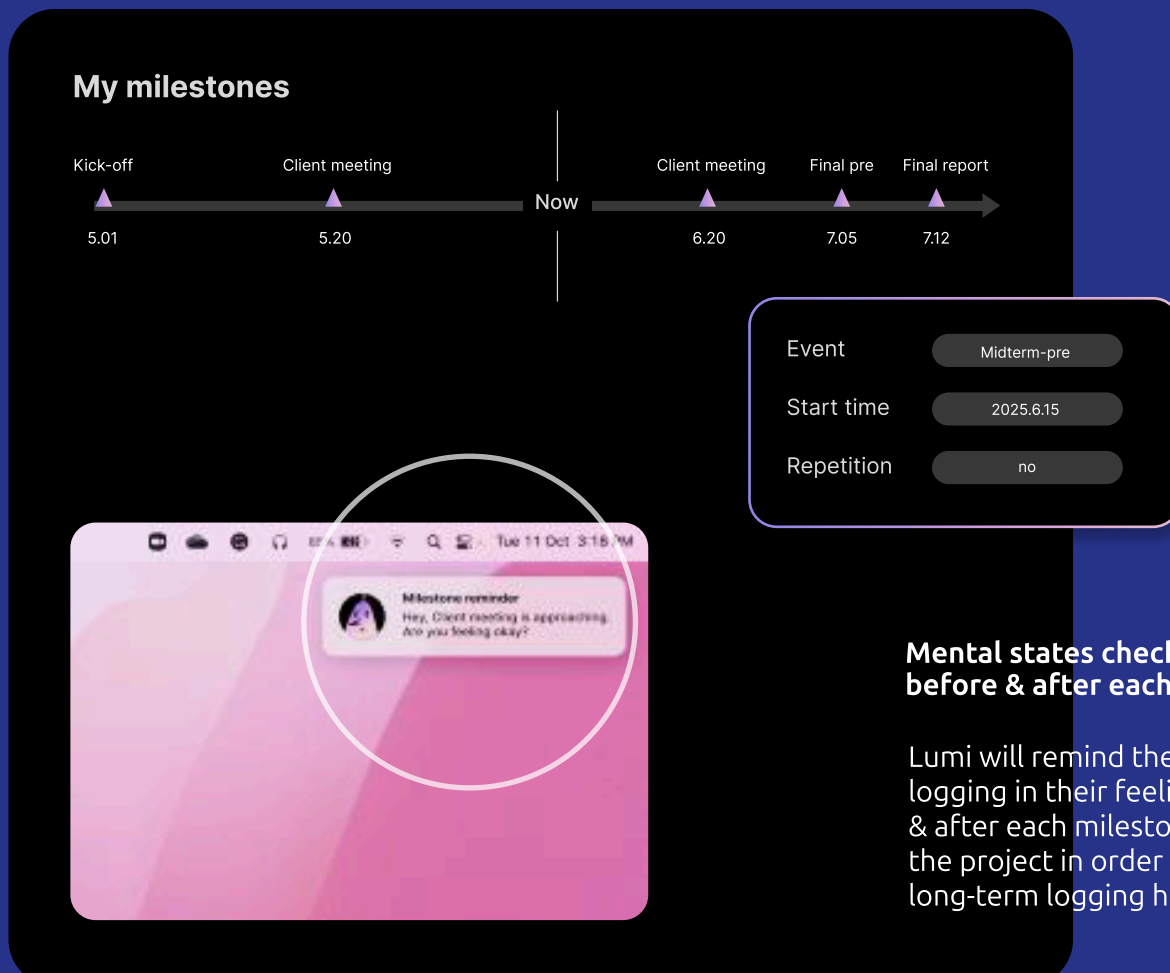
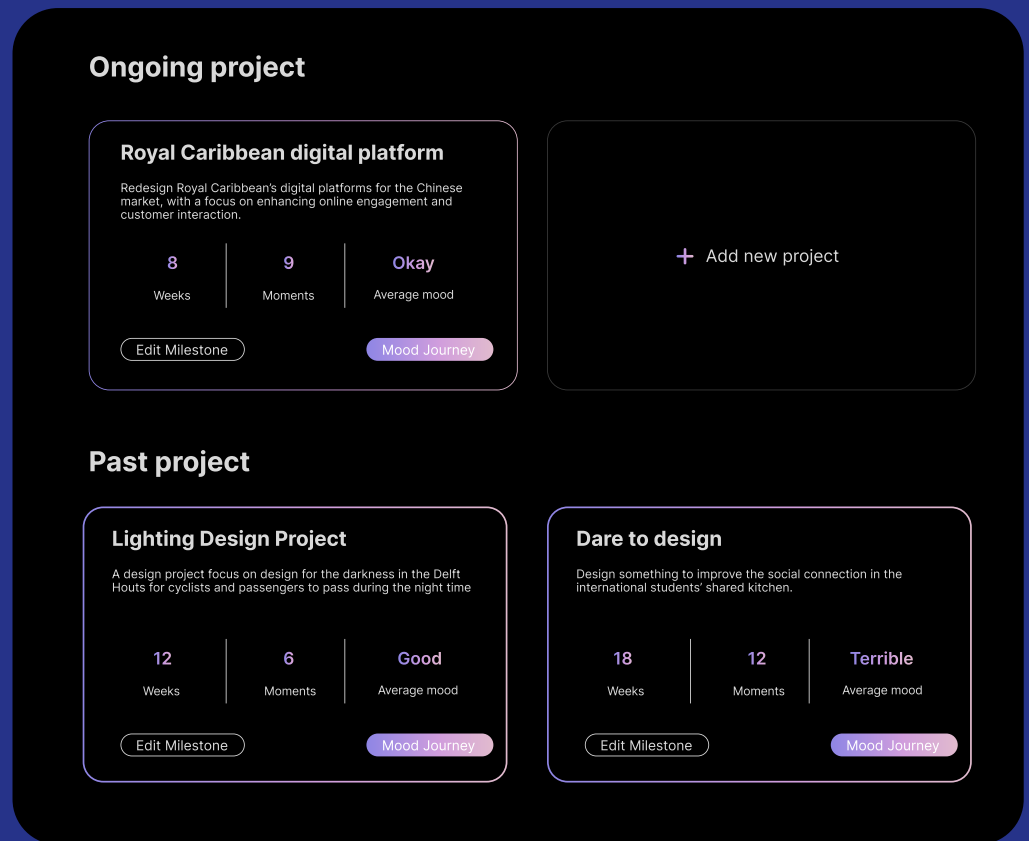
Step 4 Log in the feeling in the project journey

After chatting, system will generate a insight for the chat and log in current feeling.

Main function - Project management and milestone check-in

A collection of all design projects

User could see an overview of all the projects that they have during their design process: the duration, the introduction, and the average feeling.



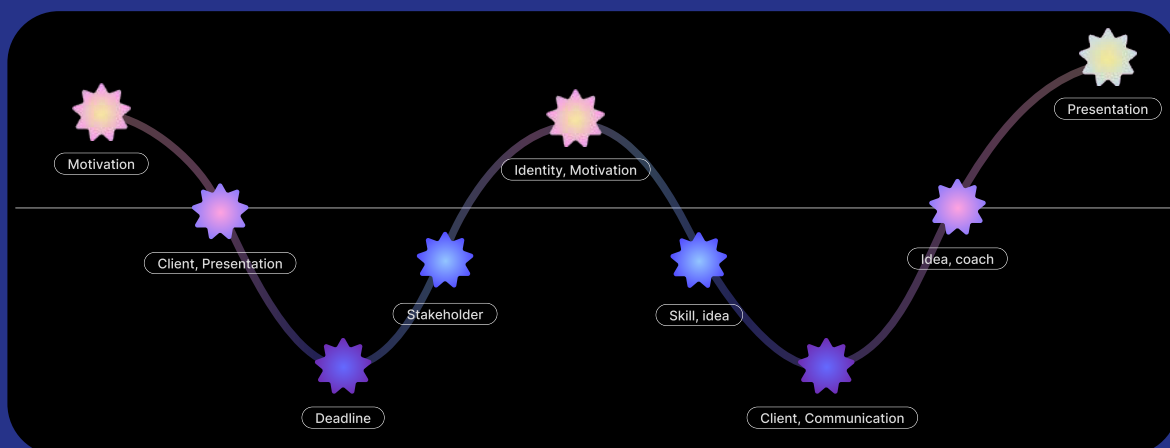
Mental states check-in before & after each milestone

Lumi will remind the user of logging in their feelings before & after each milestone during the project in order to cultivate long-term logging habit

Main function - Project journey overview

Timeline

Emotional journey will show on the timeline along with the factors that caused that feeling



Main function - End-of-project reflection

8 Weeks | 9 Moments | Okay Average mood

Information overview



2
Terrible



2
Bad



2
Okay



2
Good



1
Excellent

Analysis on project feelings

AI will calculate all moments and analyse patterns behind each feeling

Motivation 2

Presentation 2

Identity 1

Skill 1

Idea 1

Coach 1

Client 1

Deadline 1

Communication 1

Analysis on triggers behind feelings

User can choose each trigger to know which factors cause which feelings and how many times it appeared during a project



Lumi's observations

• Things to keep on going

- Adaptability Under Pressure: Even when client expectations shifted, you didn't collapse. You pivoted, reframed ideas, and explored alternatives instead of getting stuck.
- Resilience in Uncertainty: Despite tight deadlines and conflicting directions, you kept momentum. Your ability to keep moving forward shows determination and

Lumi's recommendation

Lumi will provide personal analysis based on history dialogues, including things to keep on going, things need to be aware and future recommendation.

AI strategies on different emotional journeys

AI Strategies: Provide suggestions in a neutral tone, focusing on the moments when students managed to bounce back. These **recovery moments** is important, as it shows that their coping strategies were effective.

Reflection question: “Your journey was full of ups and downs. Each low point challenged you, but you also found ways to bounce back. What do you think can help you quickly recover?”

AI Strategies: Provide suggestions in a neutral but supportive tone. Acknowledge their efforts and guide them to reflect on the reasons behind **repeated low states** and offer suggestions on how to overcome those stressful moments.

Reflection question: “This project felt heavy overall, and that’s understandable. Still, you kept going despite the setbacks. Can you notice any repeating patterns behind those low moments?”

AI Strategies: Acknowledge the positive tendency of this journey and their effort, guide them to reflect on **the learning or “aha” moments**, and use these insights to better understand their designers’ traits and build on confidence.

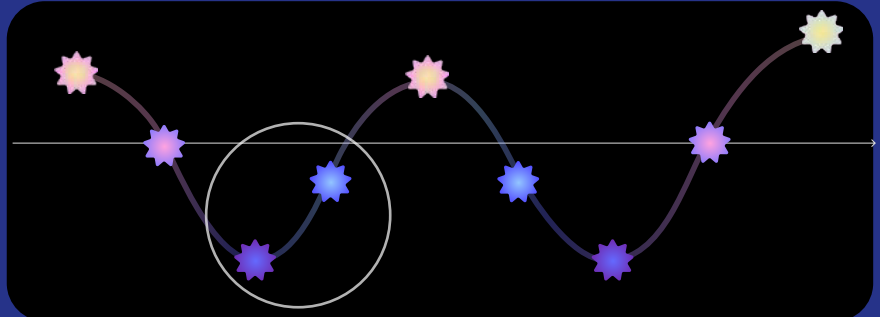
Reflection question: “You stayed positive through most of this project, which shows you’ve built good habits, good job! Why do you think it made things flow so smoothly?”

AI Strategies: This situation often occurs when students get in a not ideal grade. In such cases, students may feel distressed, so the AI need provide a space to express their feelings while also guiding deeper reflection on the **patterns may led to the bad ending**. It can also suggest practical actions, such as talking with teachers to know the reason of receiving a bad grade.

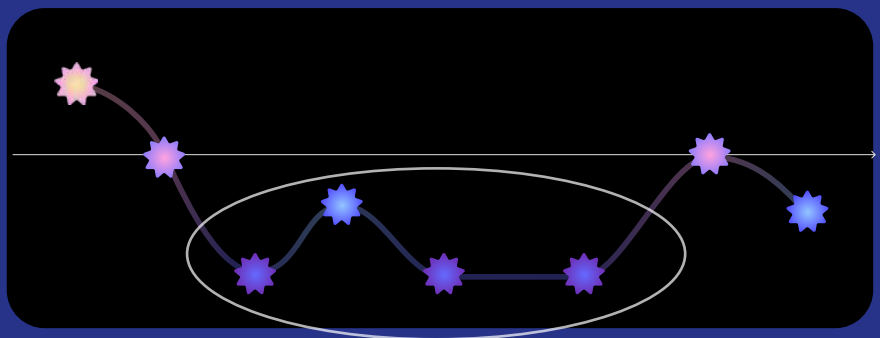
Reflection question: “Most of this project was encouraging, but the ending left you disappointed. What do you think it’s the reasons?”

Psychology shows that the ending feeling often has a stronger impact on the overall memory of an experience than the fluctuations during the process (called peak–end rule). Therefore, AI strategies should adopt different strategies for different emotional journeys, rather than using a “one-size-fits-all” approach.

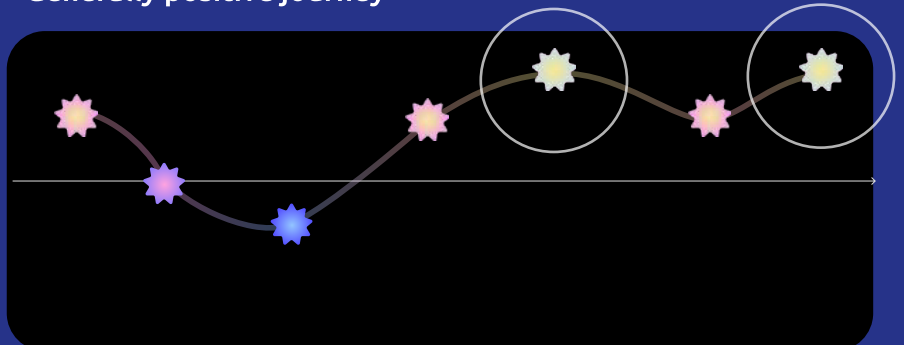
Roller coaster journey



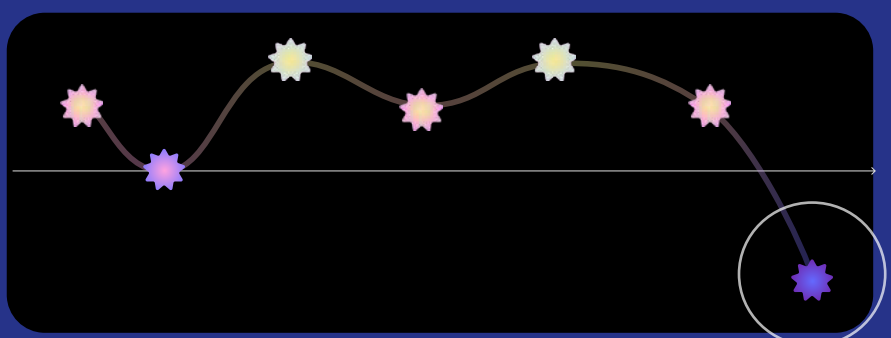
Generally negative journey



Generally positive journey



Beginning positive but with a bad ending

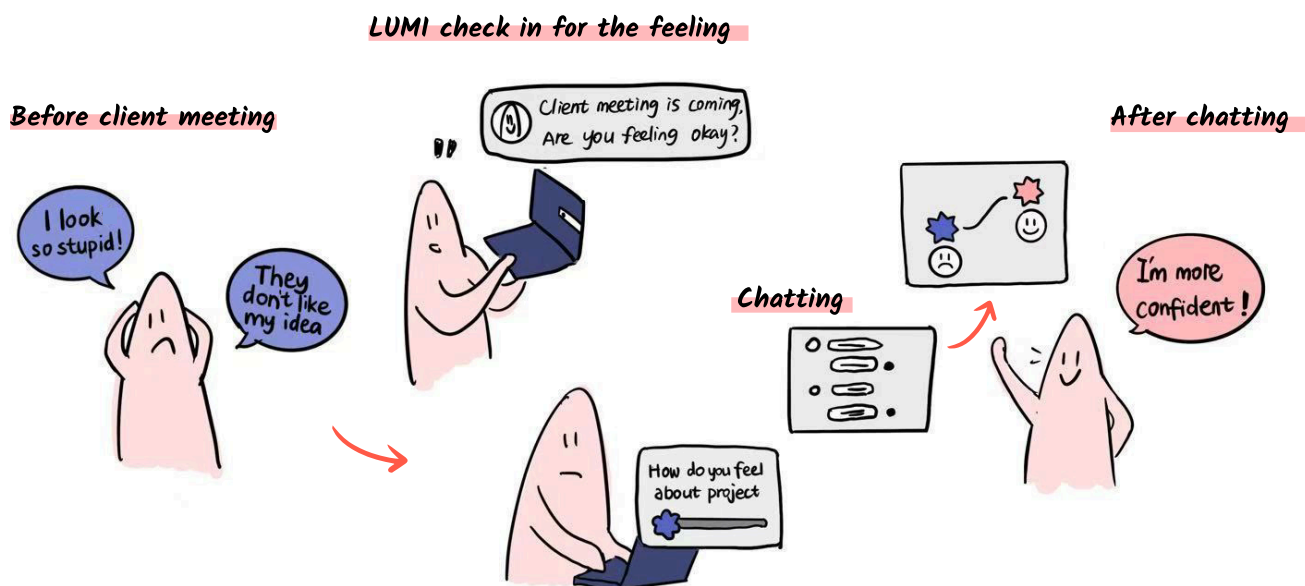


6.2 STORYBOARD

2 main scenarios are selected to explain how Lumi works:

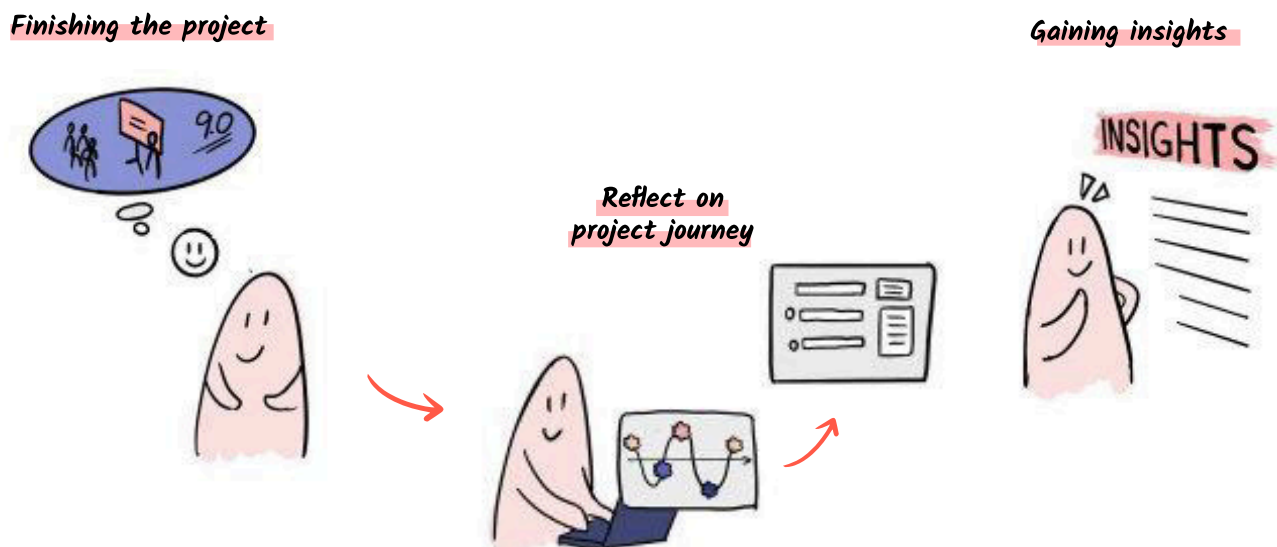
Scenario 1 - During the project, student feel anxious about the client meeting

Students feel anxious about their projects. Lumi helps to reduce anxiety and break down the problems behind it. This includes some typical designers' anxieties, such as receiving negative feedbacks, unconfident about the project and feeling lost on design directions.



Scenario 2 - After finishing the course, student check insights of the project

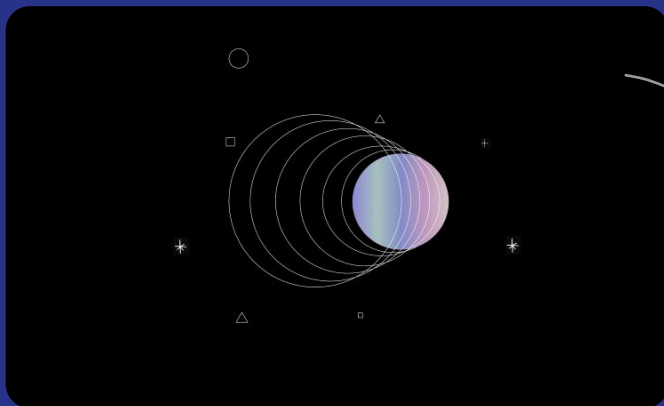
After finishing the project, students can check the overall insights throughout the project. Lumi will analyse your emotional journey and provide insights and recommendations for your future design study.



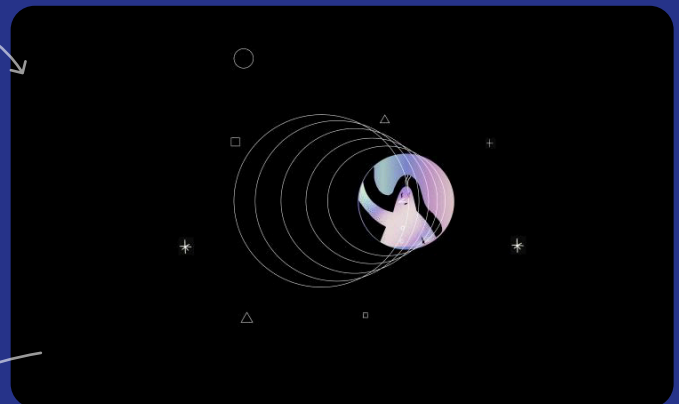
6.3 THE INTERFACE

Introduction guidance - First time use

The first time students use Lumi, it will provide an introduction guide which will help them better understand the functions and how it can support their mental well-being.



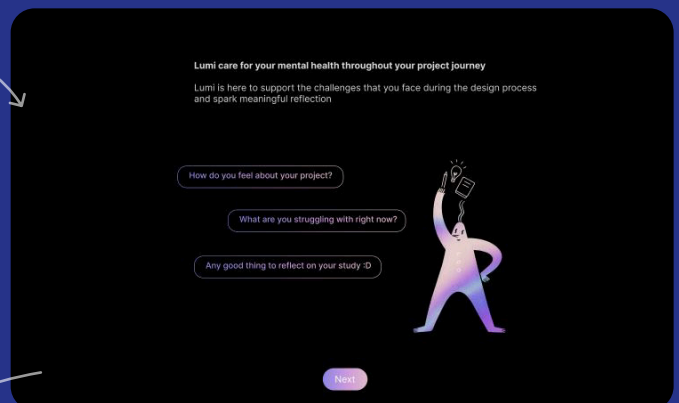
Animation



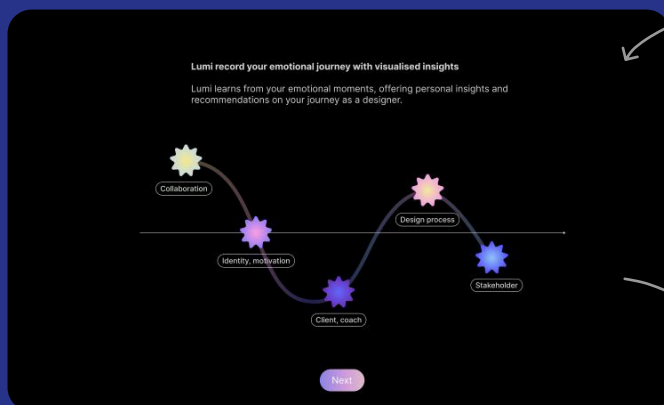
Animation



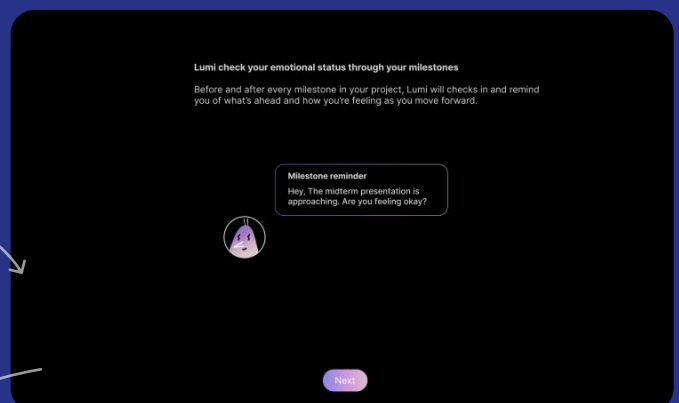
Introduce Lumi



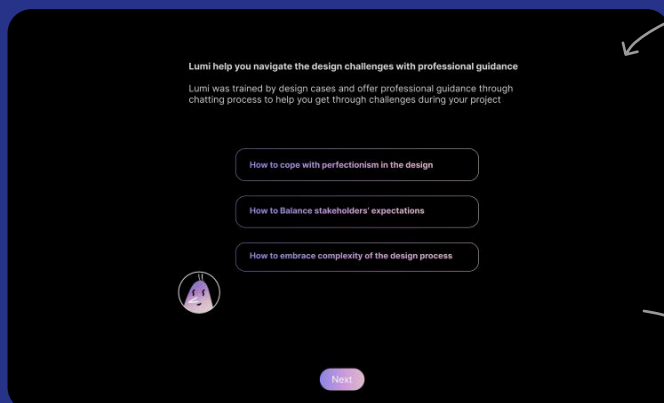
Introduction



Introduction



Introduction



Introduction

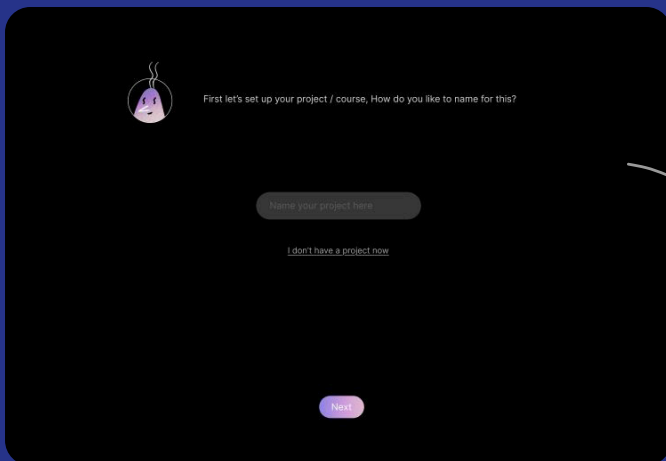


Start using Lumi

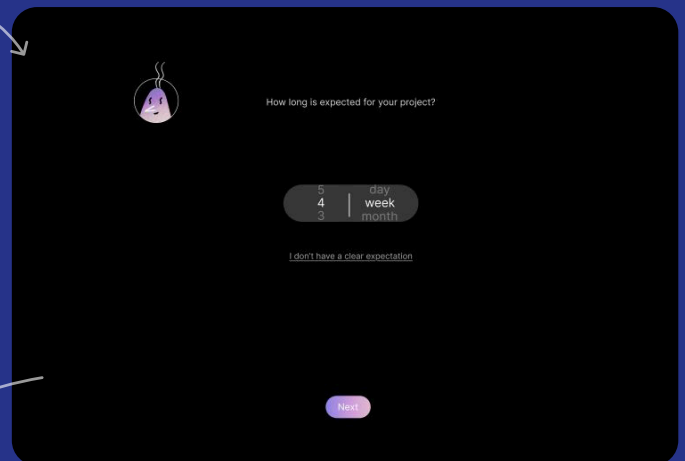
Project setup & milestone reminders

Students can create different projects based on their course study and add milestones on the timeline.

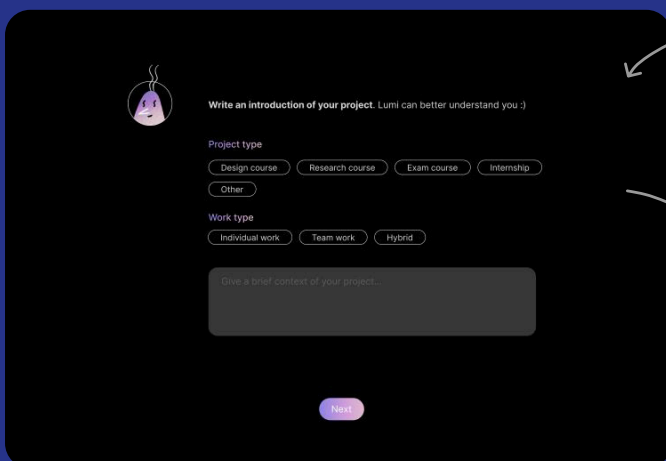
This is not only for them to have an overview of their project process, but also for the system to send a reminder before & after each important milestone to check users' feelings about their current activities.



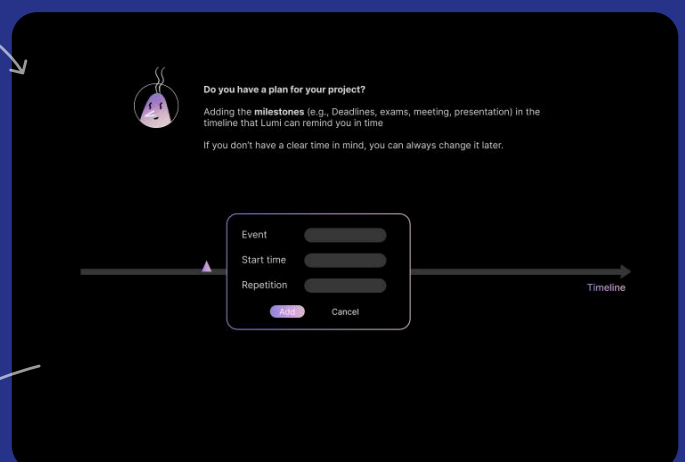
Name the project



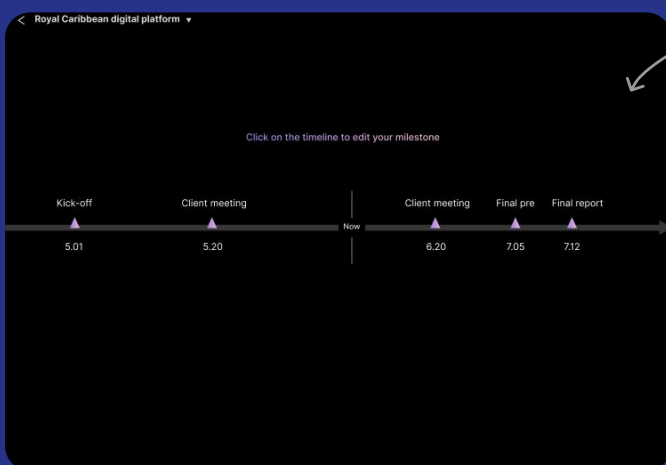
Duration of the project



Type of the project



Add project milestone



Manage the project milestone

Log-in feelings during the design process

Students can log in the feelings during the design process, this is not about anxiety, but can also be good moments of the project or something they want to reflect on. The AI chatting function is not a compulsory option, they can choose to use it or not.

How do you feel about your project right now

Terrible
★
 Excellent

I am feeling okay

Next

User indicate the current feeling on their project

What makes you feel that

Identity Motivation Skill Idea Communication

Project management Design process Decision making

Group mates Coach Stakeholder Client

Deadline Presentation Exam Meeting

Additional thoughts...

Pour your heart out... What are you feeling? What challenges are you facing? What breakthroughs did you have?

Next

Options for them to reflect on their feelings

Seems like you feel nervous about the client meeting. If you need someone to talk to, you can chat with Lumi.

Chat with Lumi No, thanks

User choose if they want to chat

Feel like I'm gonna fail the client meeting... Ahhhhhh

Hi there, this is Lumi. Seems the client meeting is very important for you. Can you tell me a bit more about your worries?

+

If user choose chat, it will put your thoughts into a chat

I mean there must have better solutions. I just haven't had time to really polish it, and I don't want to present something half-baked.

That's understandable. Wanting to do your best shows how much you care — and that's a strength. But here's a fact, it's hard to achieve perfection in design. Sometimes "half-baked" ideas are what open the door for valuable feedback.

Here are tips may help you:

Deal With Perfectionism In Design

The perfectionism in creative industry often have this problem, it can be constructive but sometimes drag us into negative spirals. There will always be room for improvement. First concept doesn't need to be perfect.

Using user interviews as opportunities for intervention and improvement instead of seeking confirmation. Sharing your unfinished projects and seeking feedback can provide fresh perspectives and help overcome challenges.

Add any thoughts here

+

Include "Resilient designers" principles coaching during the chatting

Client presentation insight

My mood journal

System logs in the feeling

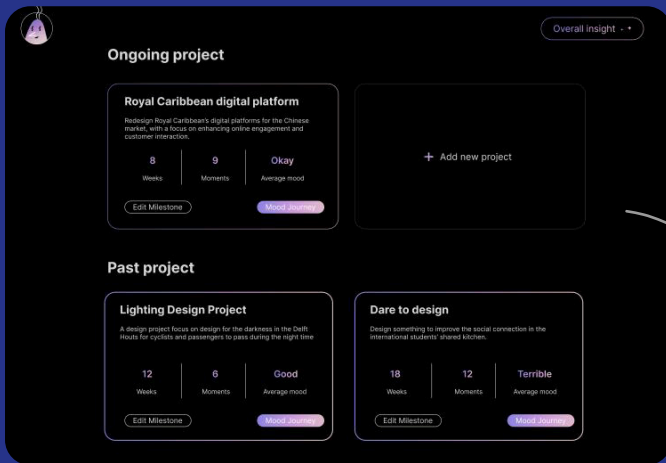
Client presentation insight

My mood journal

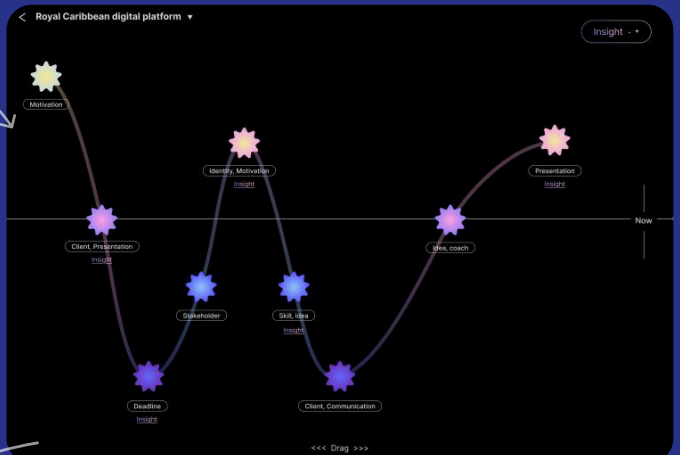
AI summarize insights

One project journey & insights

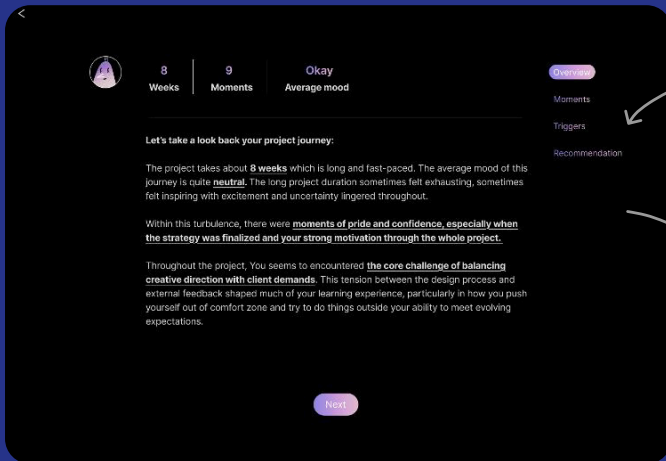
After finish the project, students can check the overall emotional journey and AI will help generate insights of the project regarding emotional moments, triggers, and some recommendations for future improvements



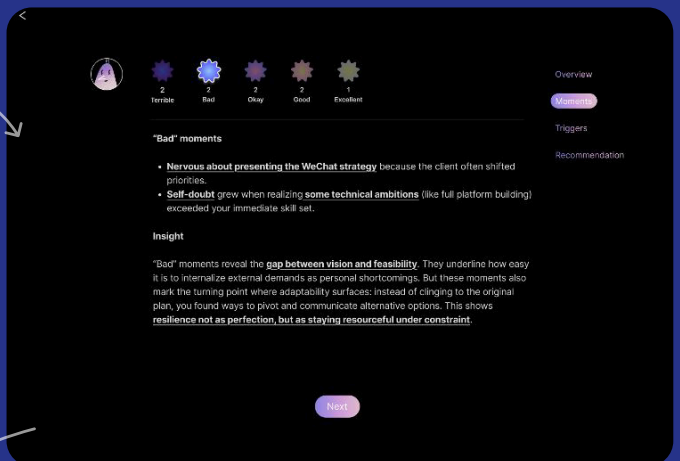
Project archive & current project



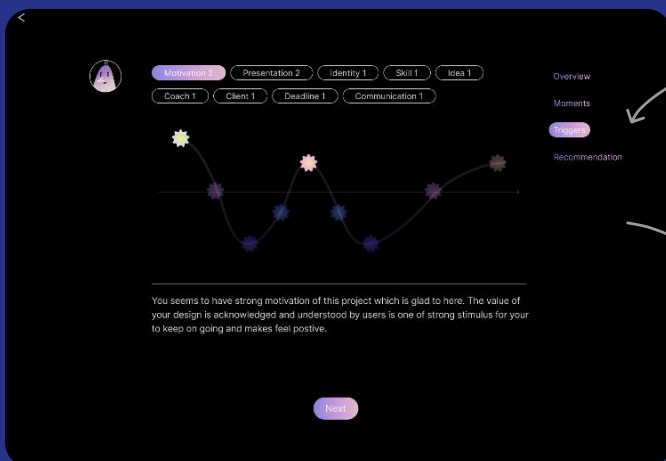
Emotional journey of the project



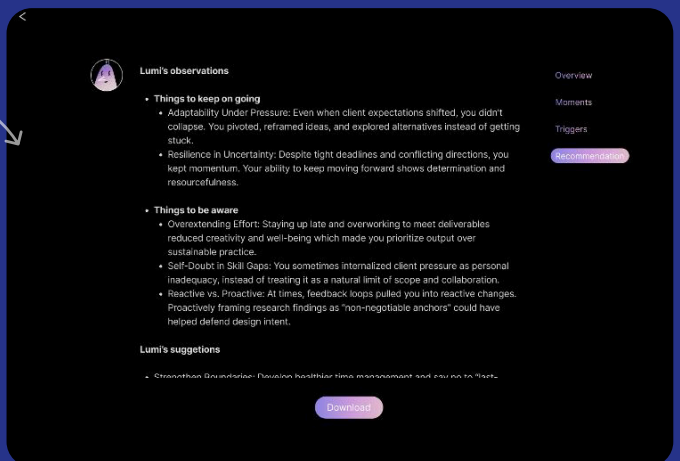
An overview of the journey



Analysis on each moments



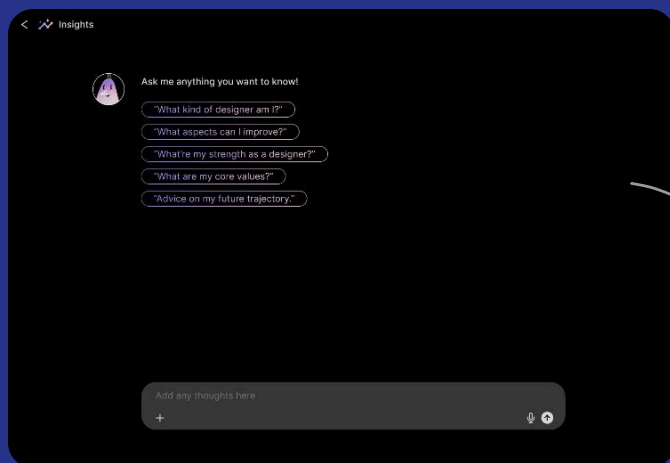
Triggers on each emotional moments



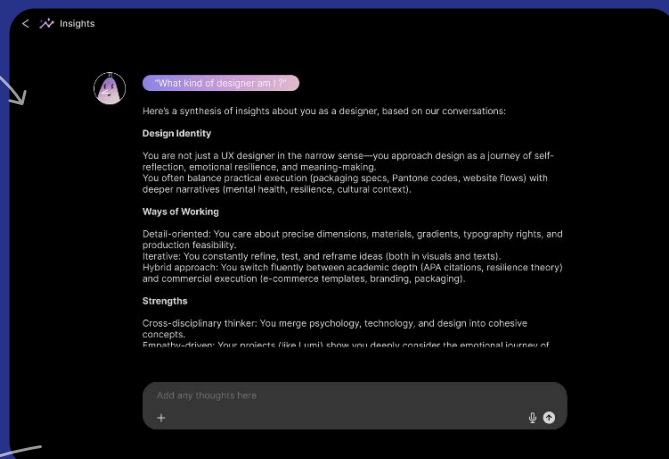
Recommendation from Lumi

Overall analysis on your designer's traits

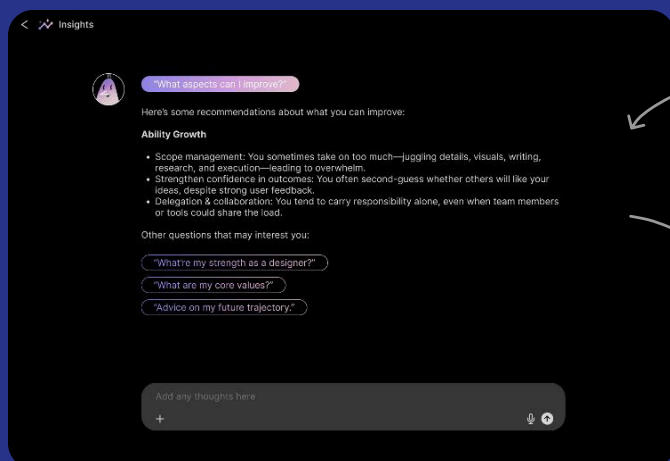
The students can ask Lumi about the insights of all the projects. Those questions link to the understanding of themselves as designers, like “What kind of designer am I?”, “What aspects can I improve?” and “Advice on my future career.”



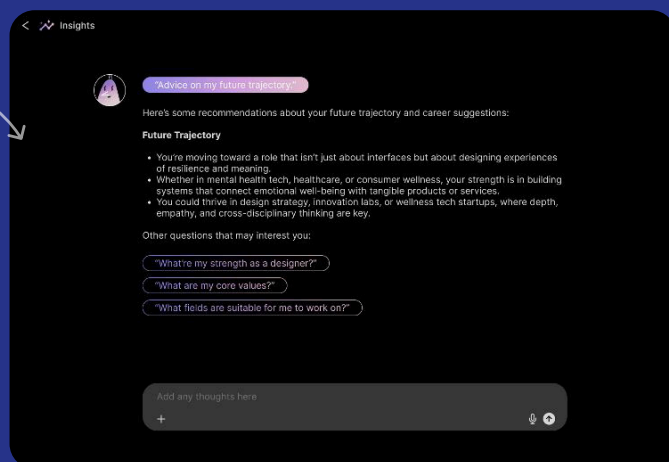
Some prepared questions



Analysis on what type of designer you are: identity, strength..



Analysis on improvements



Career path recommendation

6.4

CONNECTION BETWEEN CONCEPT AND LITERATURE

The reasons came to this design

It's completely normal to have anxiety or other negative feelings and the way we interpret those feelings influences how we feel and act. Looking at them with a constructive perspective, and learning from past anxiety or failure can provide valuable insights for our future growth and build our mental resilience, particularly in the context of personal development as a designer.

To connect it with the literature I did, Lumi has two core functions rooted in psychological theory and the principles of resilient designers.

Design rationale behind 2 main functions

Short-term anxiety coping

As design students, we often faced setbacks throughout our study. Those moments can easily trigger anxiety or other negative feelings. That's why Lumi provides mental health support based on professional psychological approaches.

In different situations, Lumi provides different coping strategies:

- When people are struggling with negative thinking, Lumi will provide help based on CBT therapy.
- When people only need a space to speak out their feelings, Lumi will serve as a listener and provide emotional support.
- When people would like a solution from lumi, it will provide suggestions on problem-solving.

Besides coping with momentary anxiety, Lumi also encourages users to document positive moments throughout the design process. This can serve as a reflection process. The reason is based on positive psychology perspectives: Recognising "what went well" fosters self-awareness of one's strengths, reinforcing self-efficacy and optimism.

This dual focus prevents the tool from being problem-centred alone or just serving as a mental therapy tool. Instead, it creates a space to show a designer's emotional landscape, like a design diary. By revisiting these moments, students can better recognise their emotional triggers as well as the conditions that stimulate their motivation and confidence during the design process.

Long-term resilience building

Resilience building is a long-term process. It cannot be achieved by one or several counselling sessions. The experiences we had before teach us how we can do next time when facing similar challenges and gradually shape us to become resilient.

In the design education, we already have the principles — resilient designers tell us how to do the right thing. But we still need ways and tools to implement this philosophy in our design study. That's why Lumi was developed to make the knowledge and methods more practical.

Also, storytelling is proven as an effective way of developing resilience. That's why Lumi integrates the emotional reflection during the design process and also at the end of the project. By writing down those thoughts or "talking it out", it can serve as a way to help people sort out their feelings and regulate emotions.

All of these functions can be more valuable with the power of AI. Using the LLMs technology, it has the potential to deliver personalised mental health care, which makes Lumi more approachable and meaningful.

Evaluation

- 7.1 Evaluation goal**
- 7.2 Set-up preparations**
- 7.3 Results**
- 7.4 Conclusion**

Introduction

This chapter focuses on the evaluation of the AI dialogue tool - Lumi.

As the project aims to explore and measure the impact of the tool on the mental well-being of design students, an evaluation will be conducted with participants from the target group - design students.

The purpose of the evaluation is to understand whether and how if Lumi can support design students dealing with momentary anxiety (short-term) and its capability of helping them build resilience over time (long-term).

For this, a functional prototype of Lumi has been developed, incorporating the core functions of the tool: short-time anxiety coping and long-term resilience building.

7.1

EVALUATION GOAL

In order to test the overall concept, a combination of tasks and open-ended interview were used to know if my design can achieve my design goal and how the intended users think about and experience the main functions of Lumi.

Key objectives

> The user experience of the concept

To understand how user feel about the concept and prototype — (User experience questionnaire)

> Anxiety coping strategy during a project

To evaluate if Lumi could reduce their anxiety by giving AI chatting support. — (slider input before & after)

> Resilience building effect after a project

To evaluate if Lumi has the potential to build resilient mindsets for design students. — (interview)

7.2

SET-UP PREPARATIONS

The prototypes

A website interface: Built in figma with interaction flows

- <https://www.figma.com/Lumi-prototype>

Lumi GPT: Since it's a prototype, it doesn't integrate the OpenAI API into the prototype. So I created a Lumi GPT built in ChatGPT to simulate the chatting function (see prompts in Appendix C).

- Anxiety coping: <https://chatgpt.com/lumi-anxiety-support>;
- Positive reflection: <https://chatgpt.com/lumi-reflect>

Participants

The sample consists of 6 design students who are studying industrial design or other design subjects like architecture. Participants will be recruited through my personal connections and will be between the ages of 22 and 27.

Location & Setup

The evaluation process is conducted in an offline setting. I will serve as the facilitator during the evaluation session. An audio recording tool will be used through the process for further data analysis (*Figure 7.1*).

Tasks

3 tasks were arranged to test the first-time experience ; anxiety-coping effect and long-term resilience building effect (*Figure 7.2*). More details can be found in Appendix D

UEQ survey

To evaluate the user experience of Lumi, a modified version of the User Experience Questionnaire (UEQ) was applied. Instead of using the original 26 items, I adapted the scale to 24 items in order to better align with the prototype's evaluation goals (see more explanation on section 7.3).

Open-end interview questions

1. How do you feel after interacting with Lumi for the first time (task 1)? Indicate your emotions, and why?
2. How do you feel after interacting with Lumi for 2 scenarios in task 2?
3. How do you like the chatting process? Do you think it will help you compared with the current intervention (ChatGPT & peer support)? (Do the designer tips & the breath exercise help you?)
4. How likely would you like to use Lumi in your future design study? (0-100%)
5. For interface details: Do you understand the category and any additions? How do you think about the reflection insights?
6. Do you have any comments or suggestions on the design?

Pilot tests

I tested the prototype with 4 design students to further improve tasks, testing process, prototypes' functions, prompts in GPTs and interfaces.

Test process

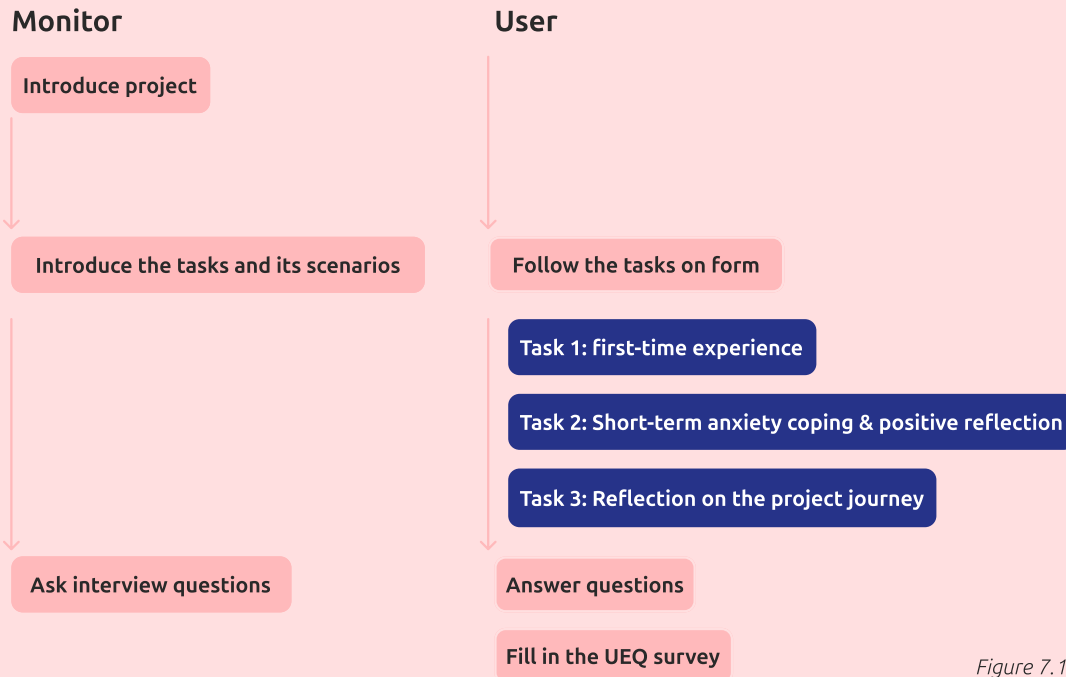


Figure 7.1: An overview of evaluation process

Tasks introduction

Task 1: first-time experience

The first time they open Lumi

- Follow the introduction guidance of Lumi
- Create a project called "Royal Caribbean digital platform" and set the milestones
- Start the first logging: experience a dialogue sample.

Task 2: Short-term anxiety coping & positive reflection

Using Lumi to talk about the anxiety & positive moment from own experiences

- scenarios 1: negative moment (depends on participants)
- scenarios 2: positive moment (depends on participants)

Task 3: Reflection on the project journey

Use Lumi to generate insights for a design project

- After they finish the "Royal Caribbean digital platform", ask them generate insight of this project
- Ask them to check overall insights (contains all projects)

Figure 7.2: An overview of 3 test tasks

7.3 RESULTS

The evaluation involved six design students from diverse design backgrounds and study stages (*Table 7.1*).

Their majors ranged from industrial design to architecture, with projects including graduation theses, research projects, internships, and group projects. Interestingly, the design backgrounds and the type of project participants were doing, as well as the severity of their current anxieties, appeared to impact their interpretations and expectations of using this tool.

Number	Track / degree	Age	The project they're doing now	How severity	What kind of the anxiety
P1	Dfi / Master	24	Graduation project	Moderate	Frustration with coach team
P2	lpd / Master	24	Graduation project	Mild	Struggling with writing thesis
P3	Dfi / Master	24	Research project	a little	Mess at the beginning of research
P4	Dfi / Master	27	Internship project	a little	Not doing the work she really want to do
P5	Architecture / Master	23	Group project	a little	Worry on teammates' motivation and skills
P6	Dfi / Master	26	Graduation project	Mild	Have a dump of ideas but don't know what to do next

Table 7.1: participant information

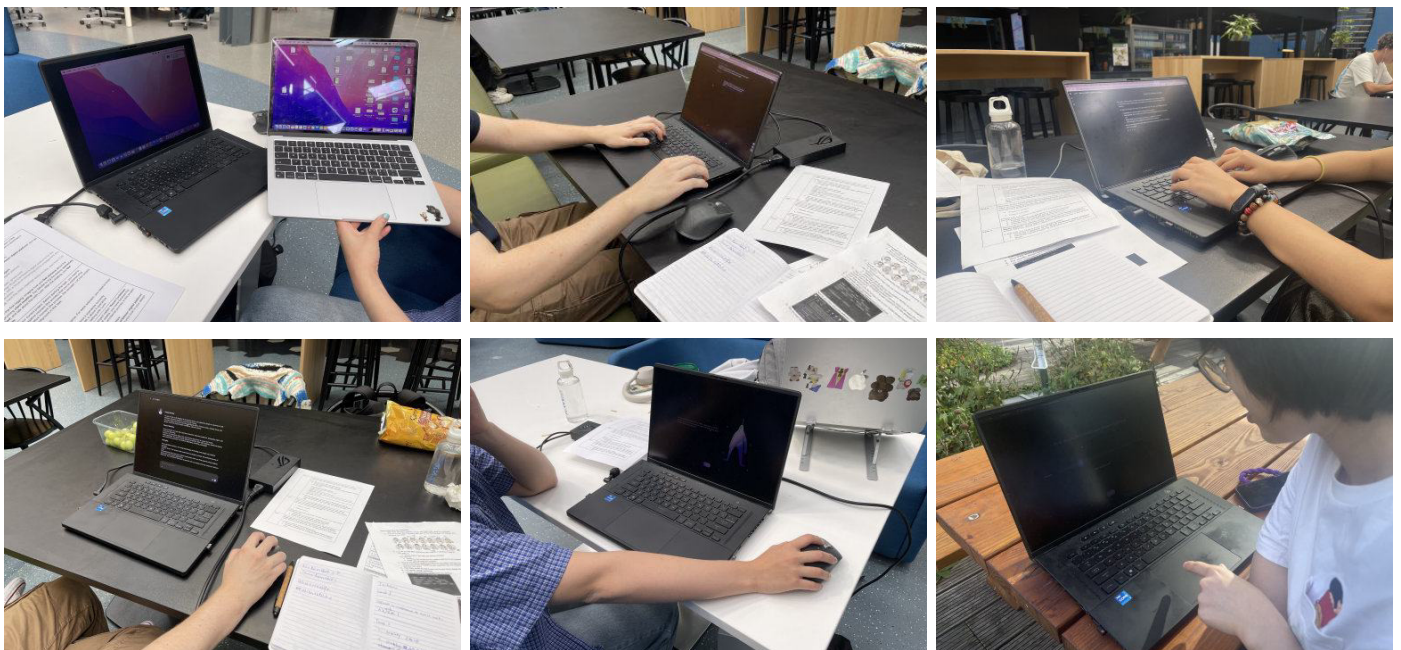


Figure 7.3: Test process

The qualitative analysis

Task 1: first-time experience

In the first task, participants were introduced to Lumi for the first time. To capture their immediate emotional responses, I used the Premo (Product Emotion Measurement Instrument), which visualises a range of negative and positive emotions through 14 characters. Six participants completed this evaluation after interacting with the prototype in task 1.

The results (*Figure 7.4*) indicate that the overall emotional response was positive but mixed. Several participants expressed curiosity and expectation, saying that the tool appeared interesting, particularly appreciating the visuals and the appearance of the Lumi character, which enhanced the appeal and friendliness of the prototype.

At the same time, participants also express a bit of confusion. Some said that the introduction was too long and text-heavy, which reduced engagement and clarity. Others reported that they did not fully understand the functions of Lumi after the introduction, suggesting that the explanation of functions should be more concise and explicit with interactions, not just reading. In addition, one participant disagreed with the AI's dialogue content, stating that it did not provide the relief he expected. This is also due to the case I gave to them is faked not their own projects. So they may lose the patience when interacting with it.

Overall, the first-time experience reveals that Lumi is perceived as visually engaging and promising, but the introduction process requires refinement. A clearer and more interactive introduction could help participants quickly understand how the tool works.

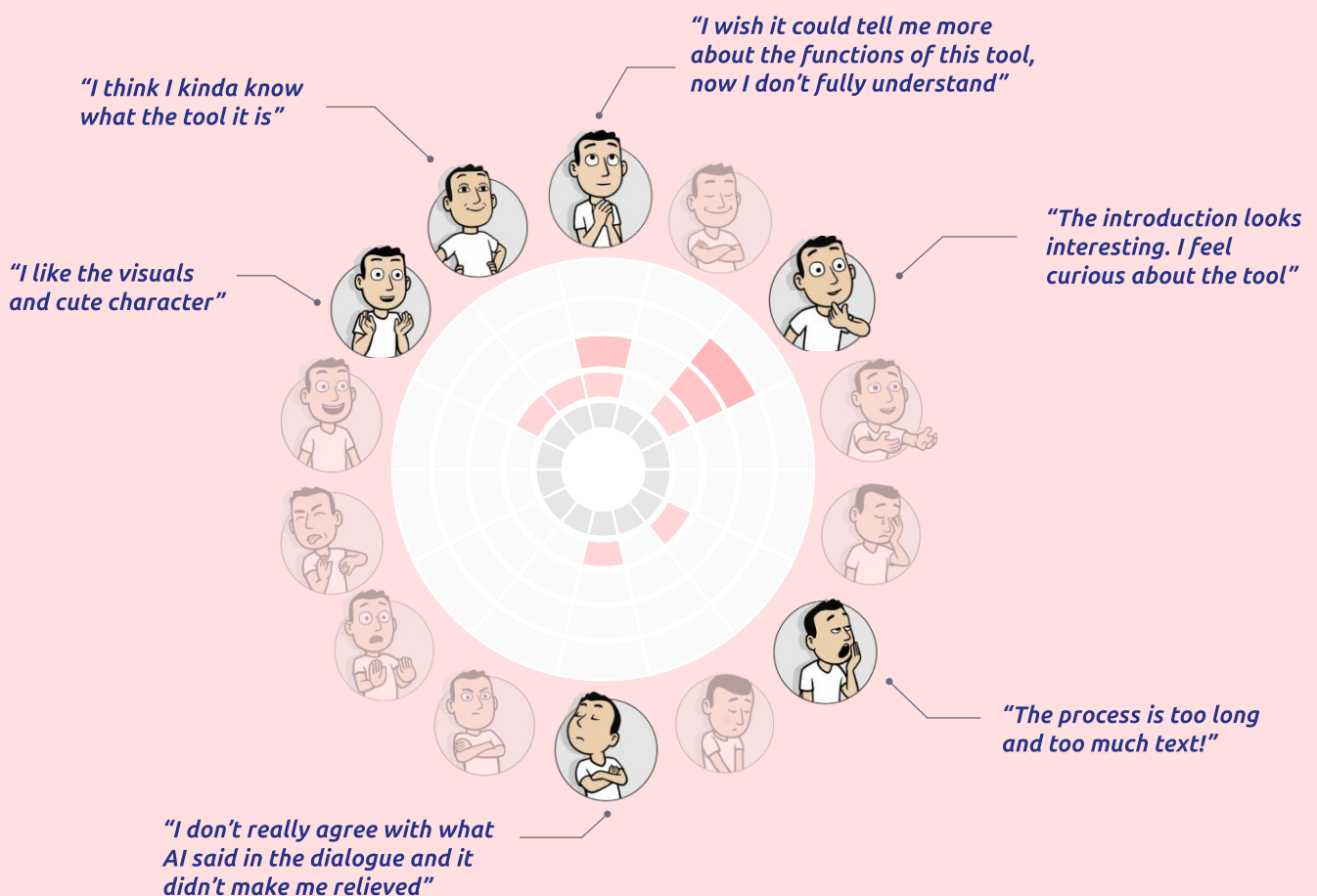


Figure 7.4: Participants' emotions overview after task 1

Task 2: Short-term anxiety coping & positive reflection

Here's a brief summary of their conversations with Lumi GPT. The screenshots involved two conversations in task 2 — one is an negative moment, and another one is a positive moment. During the test, the conversations depended on users' willingness to continue or stop. Due to the length of the conversations, more details can be found in Appendix E. The emotional change before and after chatting was measured by users' slider input on the interface.

Participant 1

Background: Second-year DFI student
The project they're doing: Graduation project
Anxiety level: Moderate
What anxiety: Frustration with coach team

"I think ChatGPT is really good at providing emotional support but it's hard to ask it to provide deep reflection that out of your own knowledge."

Anxiety coping

i feel actually very anxious, because i have so many things on my list, but my coach tends to always want the best out of me, which is not 100% possible right now, because i have other projects ongoing, even though i explained that to her she is not listening at all and keep asking me if i want to postpone the ddl, which make me feel incompetence, i really dislike that feeling

That really sounds overwhelming—and honestly, unfair. You're juggling so much, and it's completely valid to not have 100% to give all the time. The fact that you clearly communicated your limits and still feel unheard can be so demoralizing. It's like being punished for being honest.

And yeah, when someone keeps suggesting extensions, it can feel less like support and more like doubt in your capability—like they're assuming you can't handle things, when really, you just need understanding and realistic expectations.

You're *not* incompetent. You're just human, managing a heavy load.

Would it help if we talked a little about how to protect your energy when you're not being heard? Or would you prefer to just keep unloading now?

i think i did what i can do to protect myself, including defending myself during the meeting, but it still make me feel stupid, because she keep asking hard questions, it makes me feel really stupid, this is not a good way of pushing students, especially when she is the director of feminism gen ai lab

Ugh, yeah... that adds another layer, doesn't it? When someone in a *feminist* leadership role—where you'd expect empathy, empowerment, and understanding—ends up making you feel small, it's especially hard to take.

You stood up for yourself in that meeting. That takes guts. Even if it didn't change her behavior, *you* showed up for yourself—and that matters.

Hard questions aren't the problem—it's how they're asked, and whether they come with care or just pressure. It's *not* stupid to not have all the answers, especially when your energy is already stretched thin.

Can I ask—when she questions you like that, is it mostly in public settings or 1-on-1? Just so I can better understand what kind of emotional weight it's putting on you.

Positive reflection

as a designer i feel like i am sometimes stupid, i forgot some very groundline principle because of 钻牛角尖, and it is being pointed out by someone else

Hi there, this is Lumi. I'm here to help you work through challenges like that—it's honestly more common than you think.

Getting caught up in details (钻牛角尖) shows you *care deeply*. Forgetting basics sometimes? That doesn't make you stupid—it just means you're human. And honestly, having someone point it out doesn't erase your talent or effort.

Would you like a little help unpacking what made you feel that way, so we can figure out how to soften the self-criticism next time?

Bad response

unpack

Alright, let's gently unpack that together.

When you say you *forgot some very groundline principle*, can you remember what was going on in your head at the time? Like—were you feeling pressure, super focused, overthinking? Sometimes when we're deep in something, our brain narrows in and naturally filters out what seems "obvious."

And when it was *pointed out by someone else*, how did that moment feel? Was it more embarrassment, frustration, self-doubt—or a mix?

Understanding *what* triggered the "I feel stupid" thought can help you spot it next time and go, "Oh wait, I'm not stupid—I'm just stuck in a loop."

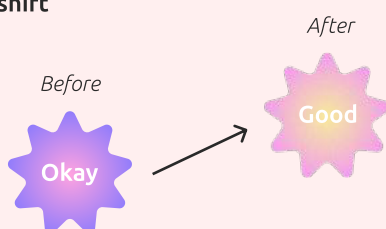
Want to talk a bit about what that moment felt like?

not necessarily

That's totally okay. No pressure at all 🍷

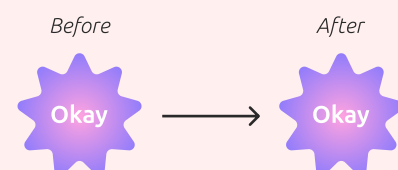
Figure 7.5: User 1's screenshots (Part)

Emotion shift



The chatbot successfully delivered emotional support, user felt she was listened and comforted

Emotion shift



User quitted the conversation as it didn't provide expected reply

Participant 2

Background: Second-year IPD student
The project they're doing: Graduation project
Anxiety level: Mild
What anxiety: Struggling with writing thesis

"It's a universal problem that AI will only provide general tips on how to deal with the procrastination behaviour."

Anxiety coping

Hey, this is Lumi. Sounds like you're in that intense final stretch—trying to wrap up your thesis and finalize the project can feel *really* overwhelming.

What kind of support are you looking for right now?

1. I need someone to listen
2. I want some suggestions
3. I don't know

🗨️ 🗨️ 🗨️ 🗨️ ...

2 & 3

Got it! Let's gently unpack this together.

First—when you say you're "stuck," is it more about:

- Not knowing what to write or do next?
- Feeling too anxious or exhausted to move forward?
- Or struggling with making decisions and second-guessing things?

Knowing that can help me guide you with clearer, more useful suggestions. What do you think?

🗨️ 🗨️ 🗨️ 🗨️ ...

About data processing and initiation. Seems like I cannot start. The amount of work is too overwhelming: too long to read & review

Thanks for sharing that—it makes a lot of sense why you're feeling stuck. When the task feels massive, even *starting* can feel like climbing a mountain.

Let's take a breath here. 🌿 It's not about doing everything—just doing the *next small thing*.

Would it help if I guided you through:

- Breaking your work into manageable chunks?
- A mindset shift to ease the pressure a bit?

Positive reflection

I feel like that the multisensory hardware system that I built is valuable in its academic research application. I want to write a paper and publish the outcome

That's amazing to hear! It sounds like you've put real thought and care into this system—and now you're seeing its potential impact. That's such a big moment 🌸 ✨

Do you want support in reflecting on your process so far or maybe help shaping your motivation into something you can build the paper around?

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Reflect the process

Great! Let's take a moment to reflect together. This helps you reconnect with *why* this project matters to you—and why it'll matter to others.

Here are a few gentle prompts to get started:

1. **What inspired you** to build a multisensory system in the first place?
2. **What felt most challenging** during the development—and how did you move through it?
3. **When did you first realize** it had academic value?
4. **How do you imagine others might use it or build on it?**

Wanna start with one of those, or would you like me to help you frame your answers into a reflection draft?

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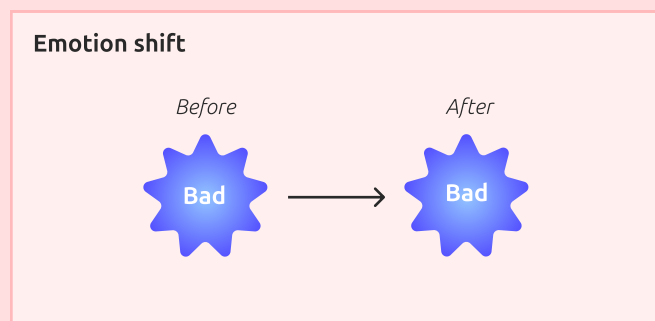
It is supposed to help people become focused in work, but as it progressed I found that this system can be applied in various scenario, extending to psychotherapy or daily life scenarios

Ooh I love that—starting with a clear intention and then discovering broader potential along the way is such a meaningful evolution 🌿

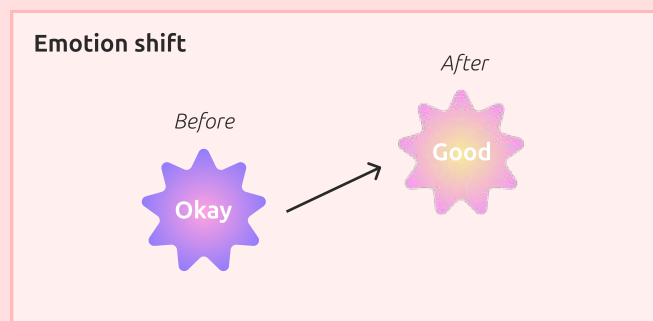
That shift you noticed—from productivity support to therapeutic and daily life applications—says a lot about how adaptable and human-centered your system really is.

Would you like to explore how that shift made you feel, or do you want help turning this insight into a part of your reflection or paper intro?

Figure 7.6: User 2's screenshots (Part)



User quitted the conversation as it didn't provide expected reply. The suggestions provide by chatbot was too superficial and didn't solve his thesis writing problem.



User said the chatbot provided some prompts that can help him to reflect on his project.

Participant 3

Background: First-year Dfi student

The project they're doing: Research project

Anxiety level: A little

What anxiety: Mess at the beginning of research

Anxiety coping

I have a meetin with my professor on a project about negative soundscape and its effect on human body physiological data. But I didn't do anything yet. I only hvae a lot of ideas but nothing was written down and also it was not structured. I also don't have much free time tmr to write them down

Hey, it's Lumi. Thanks for sharing that—sounds like you're feeling overwhelmed and maybe a little stuck. It's okay to have a bunch of ideas without structure yet. That *doesn't* mean you've done nothing.

Before we dive deeper—what kind of help are you looking for right now?

1. I need someone to listen
2. I want some suggestions
3. I don't know

Yes, totally—and that *matters* a lot here. You're not just analyzing data; you're crafting an experience or system that reveals something about how people feel and function in noisy environments. That's powerful.

So maybe your buckets don't need to be super scientific right now—they can be **design lenses**, like:

- **Experience:** How does the negative soundscape *feel* to people?
- **Body Reaction:** What changes in the body are measurable (like heart rate, skin conductance, etc.)?
- **Design Intent:** Are you trying to reveal, resist, or redesign the soundscape?
- **Form of Output:** Is it an installation? Interactive? Data visualization?

Wanna go through your raw ideas together and sort them into buckets like this? I can help you sketch it out quickly.

or can you list some research cases or ppers that you sugggest me to write

That's a really smart idea—grounding your design project in some solid research will give your ideas credibility and structure, even if you haven't formalized them yet.

"I would rather AI to give more friendly feedback on my project and what I did, like talking with my friend."

"When I feel emotional, I trust human support more."

Positive reflection

I am so happy, I am the right one who should do this research project. my coach complimented me a lot

Hi there, this is Lumi. Nice to hear that! 🌟 That sounds amazing—what do you think your coach saw in your work that made them give you such great compliments?

idk, maybe you hlep me find out that?

Of course, I'd love to help you figure that out! 😊

Let's start here—when your coach complimented you, what exactly did they say? Or how did it make you feel in that moment?

they said brilliant ideas

Ooh, "brilliant ideas" — that's a big one! ✨

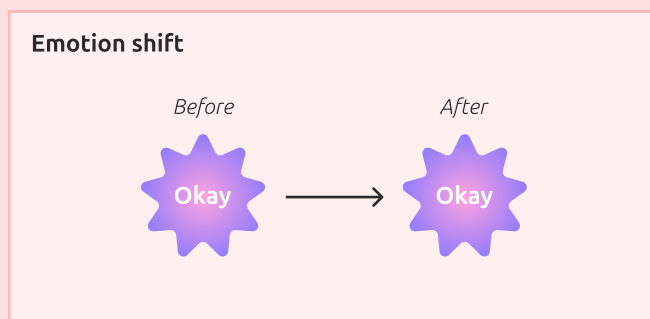
That tells me you're not just doing the project—you're *bringing something fresh* to it. Can you remember what idea or moment might've sparked that reaction?

"i knew it, i knew the idea is good and ofc hyou should compliment it"

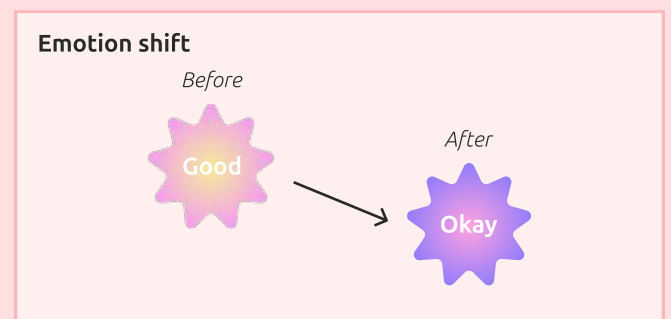
Ahh I *love* that feeling — like your inner voice finally got the spotlight it deserved! ★

Sounds like you're really owning your perspective. Do you want to explore what made you trust that idea so deeply?

Figure 7.7: User 3's screenshots (Part)



The conversation in the end led to the literature suggestions on doing the design which was not this tool aims for.



User was not satisfied with the conversation because the chatbot keep asking her questions and didn't give her useful feedback.

Participant 4

Background: First-year Dfi student
The project they're doing: Internship project
Anxiety level: A little
What anxiety: Not doing the work she really want to do

"I am not an AI person, most of time I have anxiety I prefer talk it with my friends. AI can be a support tool but please not intervene to much."

Anxiety coping

That's such a powerful desire — wanting to step into something new. It takes courage to even say that out loud.

Can I ask, what's been stopping you so far? Is it fear, doubt, not knowing where to start, or something else?

i am with my supervisor who is not doing what I really wanted to do.

Ahh, I see. That sounds tough — being tied to a path that doesn't quite feel like yours, especially with someone in a position of authority like a supervisor.

Do you feel like you're compromising too much of your vision? Or is it more that you're unsure how to bring up what you *do* want?

not really, i got the chance to work with other colleagues, so that's fine

Got it — that's actually a good sign, then. It sounds like there's a bit of breathing room, even if it's not the ideal setup.

So, with these other colleagues, do you feel like you *can* explore that thing you've never tried before? Or are there still some doubts or blocks in the way?

yea, maybe. I haven't started too much, but so far i am happy with it

That's really good to hear — even just feeling *happy with the start* is such a meaningful step. It means your instincts are pointing you toward something more aligned.

Do you feel like you need support staying connected to that feeling as the project unfolds? Or would you rather just keep flowing for now and check in later if things get rough?

Positive reflection

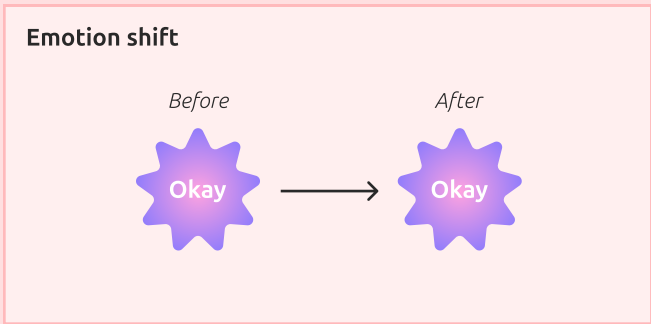
hi

Hi, this is Lumil! How's your project going?

I met a designer who is super nice, the chat with her, and makes me feel better

Hi there, this is Lumi. That's wonderful to hear! What do you think about that chat made you feel lighter or better?

Figure 7.8: User 4's screenshots (Part)



Emotion shift

She preferred to reflect by herself, and the reply from AI was not she want because it always asked the question but not giving information.

She has a strong unwillingness of using AI to deal with her emotional problems. She said she would rather talk to friends instead of letting AI to intervene.

Participant 5

Background: First-year Architecture student

The project they're doing: Group project

Anxiety level: A little

What anxiety: Worry on teammates' motivation and skills

"For some architecture projects, especially in the industry, usually they last about 1-2 years long. I think later I will lose the motivation to use this tool."

Anxiety coping

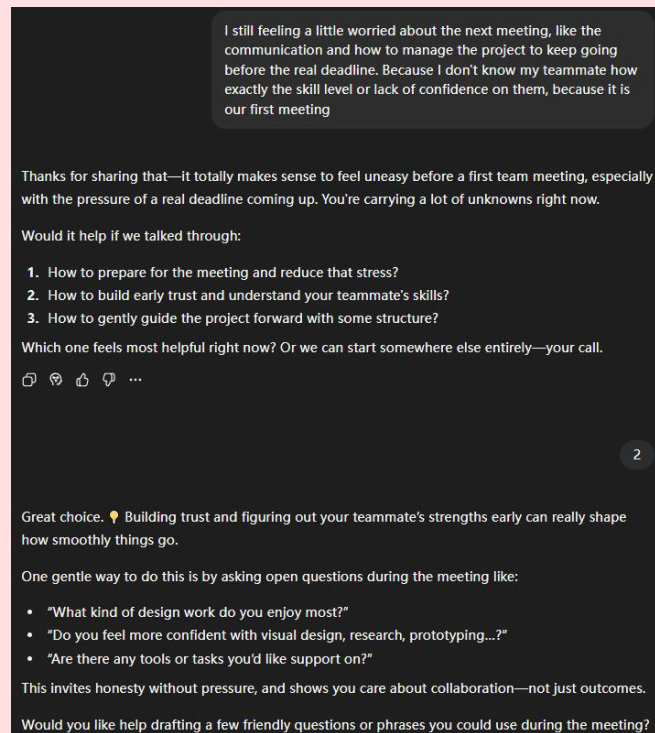
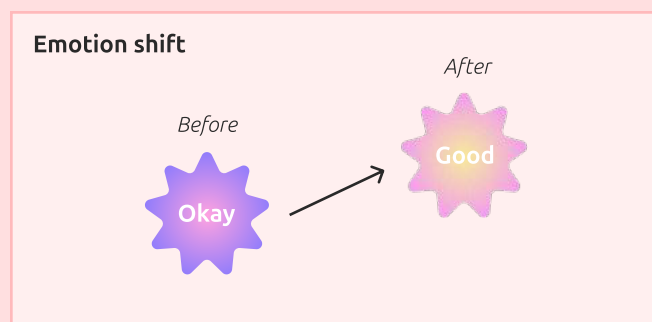


Figure 7.9: User 5's screenshots (Part)



He thought that the tips provided by chatbot make sense to him to build trust with his teammates.

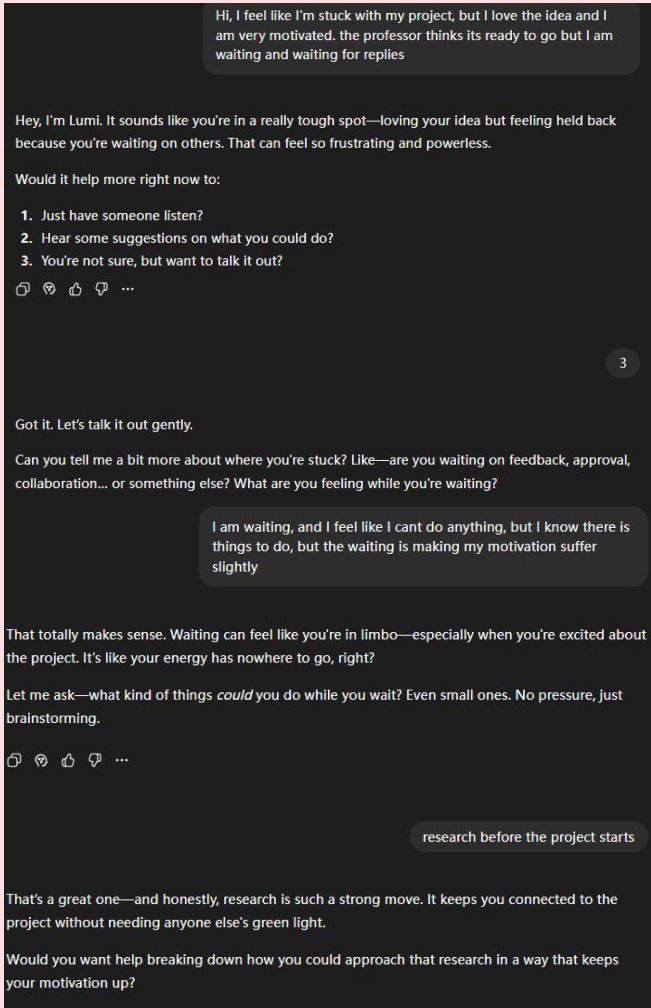
Positive reflection

Participant said he cannot think about a moment that makes him want to reflect so he skipped this task.

Participant 6

Background: Second-year Dfi student
The project they're doing: Graduation project
Anxiety level: Mild
What anxiety: Have a dump of ideas but don't know what to do next

Anxiety coping



"Sometimes I feel too lazy to document positive moments, I maybe just go for a play instead writing them down"

Positive reflection

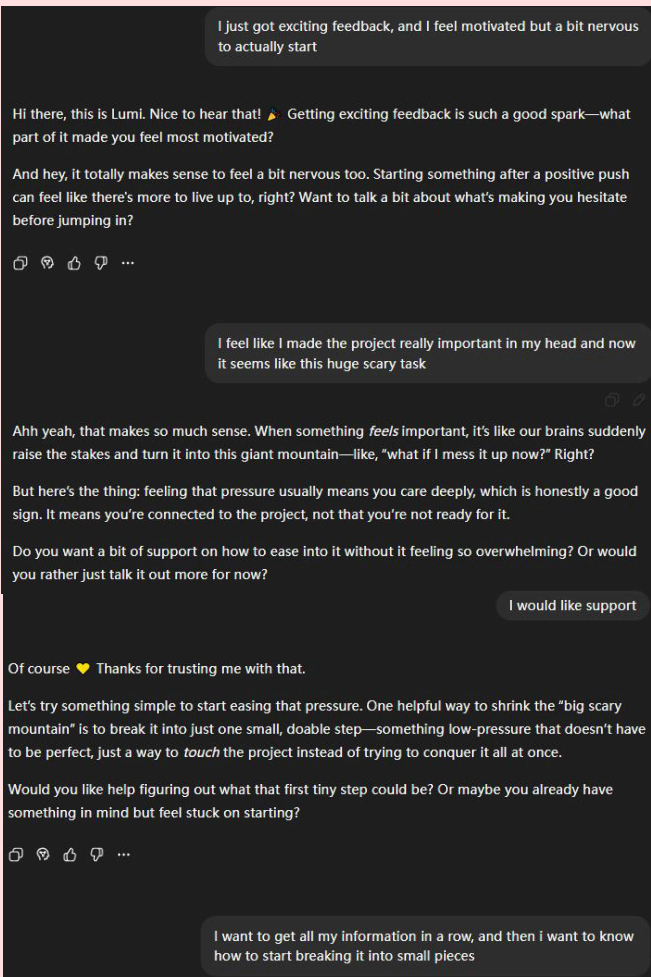
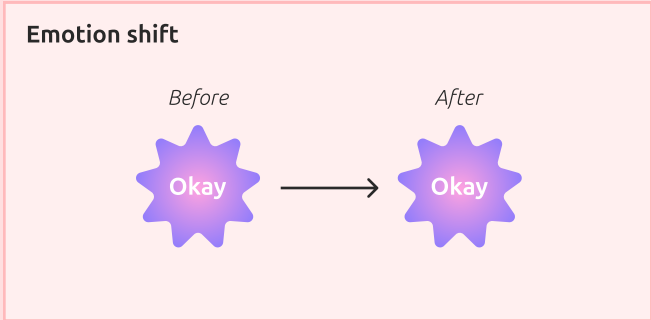
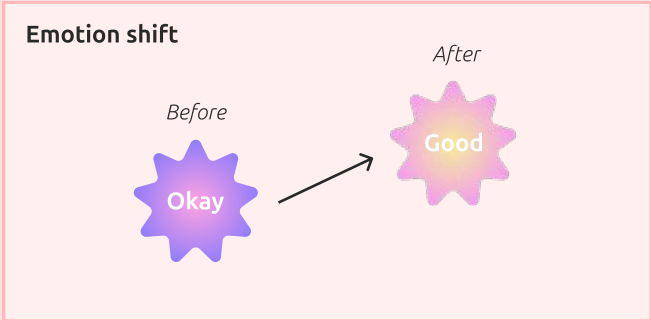


Figure 7.10: User 4's screenshots (Part)



User quitted the conversation as it didn't provide expected reply. The chatbot kept on asking questions so he didn't want to continue.



Although at the beginning he talked about positive feedback he got. But later he unconsciously to continue think about the worries on his project. But the tips he got from chatbot was good.

Task 3: Reflection on the project journey

In task 3, participants were asked to generate an overview of the project insights. This included experiencing AI-generated insights about one project and all projects. The purpose of this task was to evaluate whether Lumi could support long-term resilience building by helping students recognise patterns and reflect on emotional moments in their design study.

The responses indicated that participants found this function particularly valuable. Several participants expressed that looking back on their project journey gave them a clearer sense of progress and growth. This highlights the potential of Lumi not only as a coping tool in moments of anxiety but also as a retrospective tool for self-improvement.

"After I saw the emotional journey, I was very surprised, and I felt a sense of achievement."

"When I looked back on my journey, I've tackled so many challenges and finally I got to the end!"

"I think this is where AI can really help, provide and analyze the thing I don't aware of or I don't know"

"I think this part is very useful, especially knowing what's my weakness and how I can improve in the future."

The quantitative analysis: UEQ survey

To evaluate the user experience of Lumi, a modified version of the User Experience Questionnaire (UEQ) was applied (Appendix F). Instead of using the original 26 items, I adapted the scale to 24 items in order to better align with the prototype's evaluation goals.

It is important to note that the results are not directly comparable to the official UEQ benchmark datasets. Instead, they serve as context-specific indicators of Lumi's qualities.

> Data collection and scoring procedure

Scale: Each item was rated on a 7-point semantic differential scale (-3 = negative side, 3 = positive side).

Dimension grouping: The 24 items were clustered into six dimensions derived from the UEQ framework:

- Attractiveness (overall impression)
- Perspicuity (ease of understanding)
- Efficiency (Practical use & time)
- Dependability (Trust, control & predictability)
- Stimulation (Emotional engagement)
- Novelty (Creativity & uniqueness)

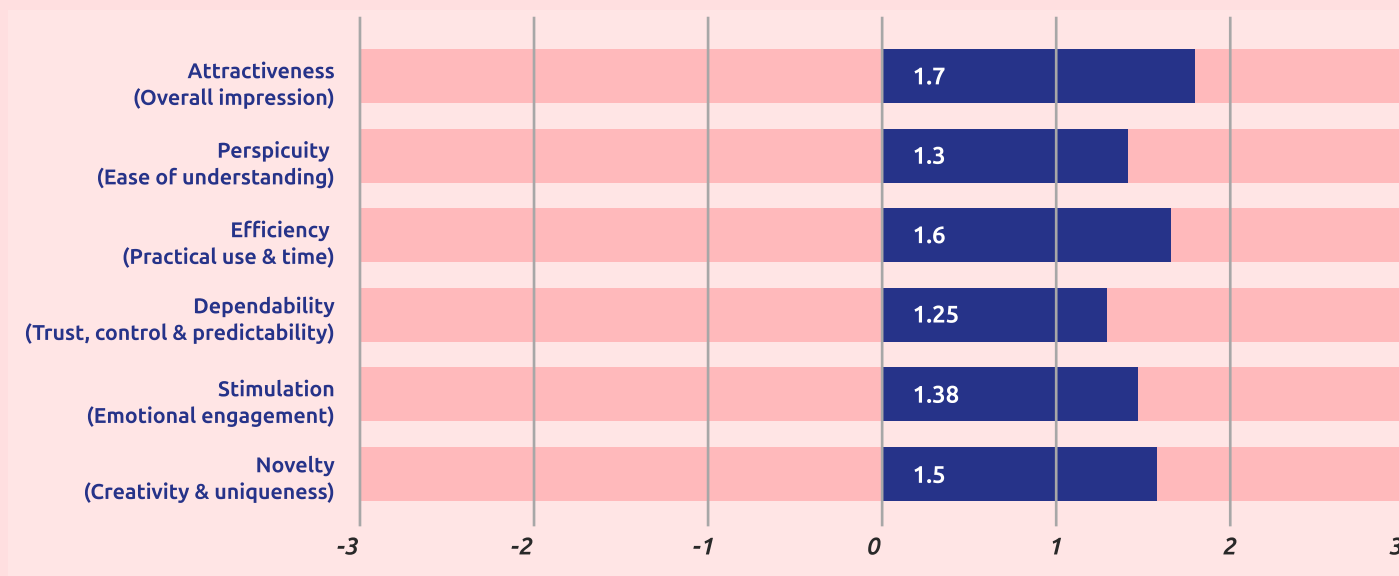


Figure 7.11: UEQ survey results

The results were based on the average points of each 24 items and then calculated the group average score (Figure 7.11). It provided a clear overview of Lumi's perceived strengths and weaknesses. In this test, participants rated Lumi particularly **high on Attractiveness, Efficiency and Novelty**, with a particular high score on feasibility, creativity and high value. **Lower but still positive** scores were observed for **Perspicuity and Dependability**, indicating that

while the concept was appreciated, the interaction flow and clarity of functions can be further refined.

Overall, the UEQ analysis indicated that Lumi was perceived as an appealing, valuable and innovative prototype with high feasibility to support students in moments of anxiety, while also highlighting potentials to further build on students' mental resilience.

7.4

CONCLUSION

Overall, 6 participants expressed an average of 70% willingness to use Lumi for the future study.

This highlighted the value of Lumi for supporting design students' mental-wellbeing by addressing the typical designers' anxieties and the importance for designers to build emotional resilience.

Analysis on evaluation goals

Anxiety coping effect

From the tests, I observed that not all the anxiety are suitable for talking with the chatbot. But there are some situations in which the chatbot shows strong potential.

Effective in providing emotional support

One participant was experiencing strong frustration with her supervisor's attitude on her project. She sought help from the chatbot and it turned out to be quite successful at delivering emotional support, making a space for emotional outlet and making her feel accompanied.

Motivating on project progress when people face deadline anxiety or don't know what to do

Lumi was especially helpful when students faced deadline anxiety or struggled to start their projects. Two participants talked about their project management: one is experiencing strong anxiety about his thesis submission deadline. The chatbot provides tips on breaking down the tasks into several steps and motivates him to start with a little step. As he said, "The things ChatGPT said I already knew, but I just need someone to tell me and push me to do the things!" Another participant, overwhelmed at the start of his thesis project. There are a dump of ideas in his mind, which made it hard for him to actually start. The chatbot provided the tip of "group scattered ideas into labeled clusters", which made him clear on what he can do next.

Limitations in the depth of advice

Not all anxiety could be reduced through chatbot interaction. One participant, who was stuck in the final phase of thesis writing, found Lumi's advice too superficial. Instead of generic suggestions such as "break down tasks," he expected more context-specific insights. This reflects a limitation of the current prototype, which was not trained with design-specific data.

AI is not the top preferred anxiety coping option

Several participants mentioned that AI would not be their first choice. As one stated, "I'm not the type of AI person. When I need support, I would first talk with my friends. Chatbot is not my priority." This suggests that Lumi's role should be positioned as complementary or support rather than a replacement for human support.

Resilient building effect

The second function focused on whether Lumi could build on long-term resilience by helping students reflect on the design process.

Good on reflecting anxiety triggers

Participants generally agreed that logging in negative emotions and the appropriate intervention from the chatbot were valuable. Lumi provides an effective way to help them sort out their thoughts and reflect on what brings their emotions. And the chatbot in some situations could also coach them on how to deal with those challenges, which can be beneficial for mental resilience.

Mixed attitudes to positive reflection

Some students were still skeptical about the usefulness of logging in positive moments. They are lacking the motivation for documenting good things unless they can get useful feedback from the tool. The benefits of good aspect reflection were still not clear to them.

High value of end-of-project insights

All participants appreciated the overall project journey and emotional insights generated by Lumi. They found these summaries meaningful for understanding themselves as designers and providing suggestions for self-improvement. As one participant said, "Looking back helps me see the patterns and what triggers my anxiety, and I can be aware of it next time."

Since resilience is a long-term process, its impact cannot be fully measured in a single test. However, participants expressed strong motivation to use Lumi in the future study, which suggests potential for gradual resilience-building if adopted consistently.

The resilient effect can be represented in different aspects, like how often they have anxiety in similar projects, the way they cope with the anxiety, and their self-perception as the designer. From the literature, a resilient designer looks at the problems with a constructive and growing lens and can easily bounce back when encountering the setbacks.

User experience of Lumi

Overall concept quality

The UEQ survey revealed that participants rated Lumi positively in terms of attractiveness, efficiency, and novelty. However, ratings for Perspicuity and Dependability were slightly lower but still positive. Some users felt confused about Lumi's scope and felt impatient with the length of introduction steps. Also, the AI's reaction of to users' anxiety is uncontrollable, which decrease the engagement of the interaction process.

First-time experience

In the first time, participants expressed curiosity and excitement but also a degree of confusion. The introduction process was perceived as too long, and several participants suggested that Lumi should demonstrate clear functions combined with interactions to strengthen trust and motivation. Now, there's too much text for them to read.

Discussion

- 8.1 Recommendation
- 8.2 Limitation

Introduction

In this chapter, I reflect on the overall project and consider the possibility of further implementations of Lumi.

In section 8.1, I proposed some recommendations for improvement on the design and discussed the using scenarios and future development of this tool. In section 8.2, I reflected on the limitation on current prototypes and research process.

8.1

RECOMMENDATION

Considerations & improvements for design

Positioning of the tool

Many students want Lumi to remain a personal space, with AI only stepping in when they proactively seek help from it. This aligns with the Resilient Designers Handbook's view that design education should provide safe, but not overly protective environments.

The positioning of Lumi must be carefully defined. It is not a therapy tool, nor should students rely on it for mental health treatment. Instead, Lumi should be framed as an emotional coach or advisor, providing support and long-term mental health tracking.

AI strategies for different emotional journeys

A simple "average mood" is insufficient to describe the whole project experience. For people who experience positive emotions all the way but in the end it falls down, it's not an appropriate way to measure the overall experience.

Also, the experience is not only influenced by the up and down moments but also significantly shaped by the ending feeling. Journeys like "roller-coaster", "generally negative", "generally positive", and "generally positive but with a bad ending" need different AI strategies. Now these strategies are not represented in the prototype's interfaces. It's important to consider them in order to deliver a responsible AI design.

Adopt gamification to increase the motivation

To increase the engagement of using this tool. Here are some suggestions:

- Add stories or cases of famous designers dealing with difficulties through AI chatting.
- Provide fun facts from the journey.
- Add more interaction with the character of Lumi.
- Personalised profiles for people show their identity, e.g., designer personality tests and tags.

Increase users' engagement for the first-time use

From the evaluation results, the first-time experience was not successful as expected. Users still find it a bit confusing to understand what the tool is about and the process lacks interactions and gives excessive information. So the introduction pages' design still need to carefully consider in order to balance the information showing and users' engagement.

Link emotions with project progress

Currently, the prototype only visualises emotions and its triggers on the timeline. Future versions could also add milestones or linked events, helping students clearly see "which event cause which emotion".

Better categorisation of the emotion triggers

Now, in the interface, the category was not very clear for users, some triggers are overlapping and there could be more triggers related to the design context. So a clearer category and structure need to be considered.

Using scenarios

Suitable for new projects and new environments

Lumi shows particular value when students start new projects or enter an unfamiliar environment (e.g., new courses, new projects or internships). Students are more motivated to record reflections at the beginning because the upcoming journey for them is unknown and explosive. For longer projects, like architecture projects in the industry, they usually last about 1-2 year. It's important to consider the different interaction strategies to engage people to use this in the long term.

Mobile using scenario

Now the design is a web-based platform, extending it to a mobile application shows important advantages for future use. An App can offer push notifications, which can remind consistent usage and it's more accessible for audio input. Also, for commuting students who take bus or train, it can serve as a lightweight journaling tool, allowing them to write reflections on the way to school or home.

Future development

Adapt for designers in all professions

Looking forward, Lumi has potential beyond the scope of this thesis. While it was designed for design students in higher education, the tool could be adapted for designers in professional practice, who face similar anxieties. With contextual adjustments in prompts and AI suggestions, Lumi could support designers at different career stages.

Integrate tool into design platforms

Lumi could be a plugin in the online design platform like Miro or Figma. This could lower the threshold for users to use, as they don't need to open a new website. And because Figma or Miro is frequently used by designers in daily lives. They are more likely to use the tool to write their reflections. And it can be easily linked to their design process and do the a better project management.

8.2

LIMITATION

Several limitations became evident throughout this project.

Limitation on design

Prototype limitation

The prototype was not fully functional but simulated through Figma and ChatGPT. So the interaction was not as smooth as expected. The substitute Lumi GPT developed in ChatGPT didn't include data training of design anxieties I've investigated and relevant coping strategies.

Also, the final evaluation test used a faked project and a scenario which decrease the user engagement and experience of this tool.

Lack deep connection with resilient design principles

In the literature study, I included the resilient design principles but in the end it's not clearly demonstrated in the concept but only represented during the chatting process. These principles serve as a strong foundation for AI to provide designer-targeted strategies which make Lumi distinctive from other mental health tools.

Bias on design

All participants in interview are studying industrial design in IDE and in the user test, there was only one participant from architecture background which reveal the design may have bias for other design subjects.

Risk on AI's role

Due the uncontrollability of AI, there're risks for users using AI for mental health support, which could raise ethical problems. This highlights the need for carefully defined boundaries in AI interventions for anxiety coping, ensuring that the tool provides supports by also advocating professional and peer support.

Limitation on user research

Small sample size

The user research and test involved a limited sample (five participants in interviews, six in evaluation), which restricted the generalisation of findings and quantitative results.

Participant background limitation

The education backgrounds of participants were not diverse enough, participants are all master's students without including bachelor's students.

Limitation on evaluation

Limitation on evaluating resilience effect

Because of the time and prototype limitations, long-term effects on resilience building didn't be measured in this project. Resilience is a gradual process so the short-term testing cannot capture these outcomes.

Didn't evaluate the prototype usability

Due to the time limitation of testing process, I didn't include usability evaluation in this project. But through my observations, there're still some usability problems to fix.

Participants' anxiety states limitation

Some participants I recruited for evaluation didn't experience anxiety at the moment or just experience a little anxiety, which may impact the result of anxiety coping effect.

Personal Reflection

Before starting my graduation project, I had some expectations about how the project would evolve and I set myself some ambitions. I once thought it would be just an academic design project, but it turned out to be more of a self-discovery process filled with unknowns and surprises. Throughout this graduation journey, I not only completed a design project but also experience profound self-growth.

Given the unique topic of my project, I had almost no precedents or existing designs to reference, which made the entire process challenging but also gave me big freedom. I read a large number of psychology books and literature, not just for the sake of project research, but to help myself better understand why people experience anxiety. This process taught me how to think critically about mental health issues and also how to cope with my anxiety when working on this project.

I really like the quote from Resilient Designers: "The resilient designer might be lost now, but knows every day is a step closer to finding their purpose." I believe this applies not only to our professional growth but also to every design project we take on. Through this graduation project, I also got stuck in the middle when doing the user research. I kept asking myself: what's the purpose of this step? How do the activities and the materials I prepared connect to my research questions? Honestly, some activities I took didn't have a clear connection with the goals of my research. My supervisors advised me to remove them if there's no meaning. But in the end, I still gave it a try because I had an instinct that it must have something related, but I cannot figure it out now. It turned out I was right. Those seemingly unrelated work ultimately became an important foundation for my final design.

So, it's not necessary that everything we do needs to have a purpose now, and then we start doing it. Just try every opportunity that drives you and trust yourself. It will lead you to the purpose that you want to find eventually. This is not only for design but also for our lives.

Thanks for this project, it helped me see my strengths and weaknesses as a designer more clearly, and know what I want to do in the future. I think I will keep on developing this tool, not for me, but for people who have faced the same problems that I experienced, and those who would like to know themselves better.

Hopefully, we can all become resilient designers!

Reference

Andrews, G., Newby, J. M., & Williams, A. D. (2023). Internet-delivered cognitive behaviour therapy for anxiety disorders is here to stay. *Internet Interventions*, 33, 100636.

Bason, C. (2018). *Leading Public Sector Innovation: Co-creating for a Better Society*. Policy press. Management international.

Beck, A. T. (1976). *Cognitive therapy and the emotional disorders*. International Universities Press.

Casu, M., Triscari, S., Battiato, S., Guarnera, L., & Caponnetto, P. (2024). AI Chatbots for Mental Health: A Scoping Review of Effectiveness, Feasibility, and Applications. *Applied Sciences*, 14(13), 5889. <https://doi.org/10.3390/app14135889>

Bason, C. (2018). *Leading Public Sector Innovation: Co-creating for a Better Society*. Policy press. Management international.

Chand, S. P., Kuckel, D. P., & Huecker, M. R. (2023). *Cognitive Behavior Therapy*. In StatPearls. StatPearls Publishing.

Chaudhry, S., Tandon, A., Shinde, S., & Bhattacharya, A. (2024). Student psychological well-being in higher education: The role of internal team environment, institutional, friends and family support and academic engagement. *PloS one*, 19(1), e0297508. <https://doi.org/10.1371/journal.pone.0297508>

Chin, H., Song, H., Baek, G., Shin, M., Jung, C., Cha, M., Choi, J., & Cha, C. (2023). The Potential of Chatbots for Emotional Support and Promoting Mental Well-Being in Different Cultures: Mixed Methods Study. *Journal of medical Internet research*, 25, e51712. <https://doi.org/10.2196/51712>

Cognitive Behavioral Therapy Los Angeles. (2020). What is Cognitive Behavioral Therapy? Retrieved June 21, 2025, from <https://cogbtherapy.com/about-cbt>

Desmet, P. M. A. (2002). *Designing emotions* (Doctoral dissertation, Delft University of Technology). Delft University Press.

Desmet, P. M. A. (2003). Measuring emotion: Development and application of an instrument to measure emotional responses to products. In M. A. Blythe, K. Overbeeke, A. F. Monk, & P. C. Wright (Eds.), *Funology: From usability to enjoyment* (pp. 111–123). Dordrecht: Kluwer Academic Publishers. https://doi.org/10.1007/1-4020-2967-5_12

Docter, P. (Director). (2015). *Inside out* [Film]. Pixar Animation Studios; Walt Disney Pictures.

East, L., Jackson, D., O'Brien, L., & Peters, K. (2010). Storytelling: an approach that can help to develop resilience. *Nurse researcher*, 17(3), 17–25. <https://doi.org/10.7748/nr2010.04.17.3.17.c7742>

Haber, N., Moore, T., et al. (2025). Risks in AI mental health tools: Bias and safety issues in LLM-based therapy chatbots. Stanford University HAI Report.

Hartley M. T. (2011). Examining the relationships between resilience, mental health, and academic persistence in undergraduate college students. *Journal of American college health : J of ACH*, 59(7), 596–604. <https://doi.org/10.1080/07448481.2010.515632>

Harvard Health Publishing. (2021, August). Giving thanks can make you happier. Harvard Health. Retrieved June 21, 2025, from <https://www.health.harvard.edu/healthbeat/giving-thanks-can-make-you-happier>

Hollon, S.D., Stewart, M.O., & Strunk, D.R. (2006). Enduring effects for cognitive behavior therapy in the treatment of depression and anxiety. *Annual review of psychology*, 57, 285–315 .

Ingram, R.E., & Kendall, P.C. (1987). The cognitive side of anxiety. *Cognitive Therapy and Research*, 11, 523–536.

Kim, J., Kwon, J. H., Kim, J., Kim, E. J., Kim, H. E., Kyeong, S., & Kim, J. J. (2021). The effects of positive or negative self-talk on the alteration of brain functional connectivity by performing cognitive tasks. *Scientific Reports*, 11(1), 14873. <https://doi.org/10.1038/s41598-021-94328-9>

Laugwitz, B., Held, T., & Schrepp, M. (2008). Construction and evaluation of a user experience questionnaire. *Proceedings of the Symposium of the Austrian HCI and Usability Engineering Group*, 63–76. Springer. https://doi.org/10.1007/978-3-540-89350-9_6

Li, T., Duan, W., & Guo, P. (2017). Character strengths, social anxiety, and physiological stress reactivity. *PeerJ*, 5, e3396. <https://doi.org/10.7717/peerj.3396>

Manzini, E. (2015). *Design, When Everybody Designs: An Introduction to Design for Social Innovation*.

Mayo Clinic. (2025, March). Cognitive behavioral therapy. Mayo Clinic. <https://www.mayoclinic.org/tests-procedures/cognitive-behavioral-therapy/about/pac-20384610>

May, R. (1950). *The meaning of anxiety* [Digitized edition]. New York, NY: The Ronald Press Company. <https://archive.org/details/meaningofanxiety00mayr>

Neff, K. D. (2003). Self-compassion: An alternative conceptualization of a healthy attitude toward oneself. *Self and Identity*, 2(2), 85–101. <https://doi.org/10.1080/15298860309032>

Neff, K. D. (2012). The science of self-compassion. In C. Germer & R. Siegel (Eds.), *Compassion and Wisdom in Psychotherapy* (pp. 79–92). Guilford Press.

Park, N., Peterson, C., Szvarca, D., Vander Molen, R. J., Kim, E. S., & Collon, K. (2014). Positive Psychology and Physical Health: Research and Applications. *American journal of lifestyle medicine*, 10(3), 200–206. <https://doi.org/10.1177/1559827614550277>

Pataranutaporn, P., Winson, K., Yin, P., Lapapirojn, A., Ouppaphan, P., Lertsutthiwong, M., Maes, P., & Hershfield, H.E. (2024). Future You: A Conversation with an AI-Generated Future Self Reduces Anxiety, Negative Emotions, and Increases Future Self-Continuity. *2024 IEEE Frontiers in Education Conference (FIE)*, 1-10.

Pavlopoulos, A., Rachiotis, T., & Maglogiannis, I. (2024). An overview of tools and technologies for anxiety and depression management using AI. *Applied Sciences*, 14(19), 9068. <https://doi.org/10.3390/app14199068>

Peterson, C., & Seligman, M. E. P. (2004). *Character strengths and virtues: A handbook and classification*. Oxford University Press.

Peterson, C., & Seligman, M. E. P. (2004). *Character strengths and virtues: A handbook and classification*. Oxford University Press.

Roozenburg, N. F. M., & Eekels, J. (1998). *Productontwerpen: Structuur en methoden*.

Price, R., & van der Bijl-Brouwer, M. (2023). EDUCATING RESILIENT AND WELL DESIGNERS. *Proceedings of the International Conference on Engineering and Product Design Education, EPDE 2023*.

Price, R., & van der Bijl-Brouwer, M. (2023). The Resilient Designers Handbook. *Resilient Designers*. https://resilientdesigners.com/wp-content/uploads/2023/09/TheResilientDesignersHandbook_RPrice_MvanderbijlBrouwer.pdf

Rollwage, M., Habicht, J., Juechems, K., Carrington, B., Viswanathan, S., Stylianou, M., Hauser, T.U., & Harper, R. (2023). Using Conversational AI to Facilitate Mental Health Assessments and Improve Clinical Efficiency Within Psychotherapy Services: Real-World Observational Study. *JMIR AI*, 2.

Positive Psychology. (n.d.). Difference between traditional psychology & positive psychology [Image]. Positive Psychology. <https://positivepsychology.com/>

Robin, B.R. (2016). The Power of Digital Storytelling to Support Teaching and Learning. *Digital Education Review*, 17-29.

Rutledge, P. (2016). Everything is story: Telling stories and positive psychology. In E. M. Gregory & P. Rutledge (Eds.), *Exploring positive psychology: The science of happiness and well-being* (pp. ...–...). ABC-Clio Praeger.

Scherer, K. R. (2001). Appraisal considered as a process of multilevel sequential checking. In K. R. Scherer, A. Schorr, & T. Johnstone (Eds.), *Appraisal processes in emotion: Theory, methods, research* (pp. 92–120). Oxford University Press.

Shadinger, D., Katsion, J., Myllykangas, S., & Case, D. (2019). The impact of a positive, self-talk statement on public speaking anxiety. *College Teaching*, 68(1), 1–7. <https://doi.org/10.1080/87567555.2019.1680522>

Sisto, A., Vicinanza, F., Campanozzi, L. L., Ricci, G., Tartaglini, D., & Tambone, V. (2019). Towards a Transversal Definition of Psychological Resilience: A Literature Review. *Medicina* (Kaunas, Lithuania), 55(11), 745. <https://doi.org/10.3390/medicina55110745>

Smith, C. A., & Lazarus, R. S. (1990). Emotion and adaptation. In L. A. Pervin (Ed.), *Handbook of personality: Theory and research* (pp. 609–637). The Guilford Press.

Stappers, P. J., & Giaccardi, E. (2017). Research through Design. In M. Soegaard & R. Friis-Dam (Eds.), *The Encyclopedia of Human-Computer Interaction* (2nd ed., pp. 1–94). The Interaction Design Foundation. research.tudelft.nl

Southwick, S. M., & Charney, D. S. (2018). *Resilience: The Science of Mastering Life's Greatest Challenges*. Cambridge University Press.

Tan, G.X., Soh, X.C., Hartanto, A., Goh, A.Y., & Majeed, N.M. (2023). Prevalence of Anxiety in College and University Students: An Umbrella Review. *Journal of Affective Disorders Reports*.

Tugade, M. M., & Fredrickson, B. L. (2004). Resilient individuals use positive emotions to bounce back from negative emotional experiences. *Journal of personality and social psychology*, 86(2), 320–333. <https://doi.org/10.1037/0022-3514.86.2.320>

Wong, P.T. (2011). Positive psychology 2.0: Towards a balanced interactive model of the good life. *Canadian Psychology*, 52, 69-81.

Yoo, D. W., Shi, J. M., Rodriguez, V. J., & Saha, K. (2025). AI chatbots for mental health: Values and harms from lived experiences of depression. *arXiv preprint, arXiv:2504.18932*. (Interview study on depression self-management chatbot Zenny)

Appendices

Appendix A - Interview materials

Appendix B - Interview results

Appendix C - ChatGPT prompts

Appendix D - Evaluation tasks

Appendix E - Chatbot screenshots

Appendix F - UEQ survey & results

Project Brief



[Scan to see the appendices](#)

What does not kill us will eventually
makes us stronger

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