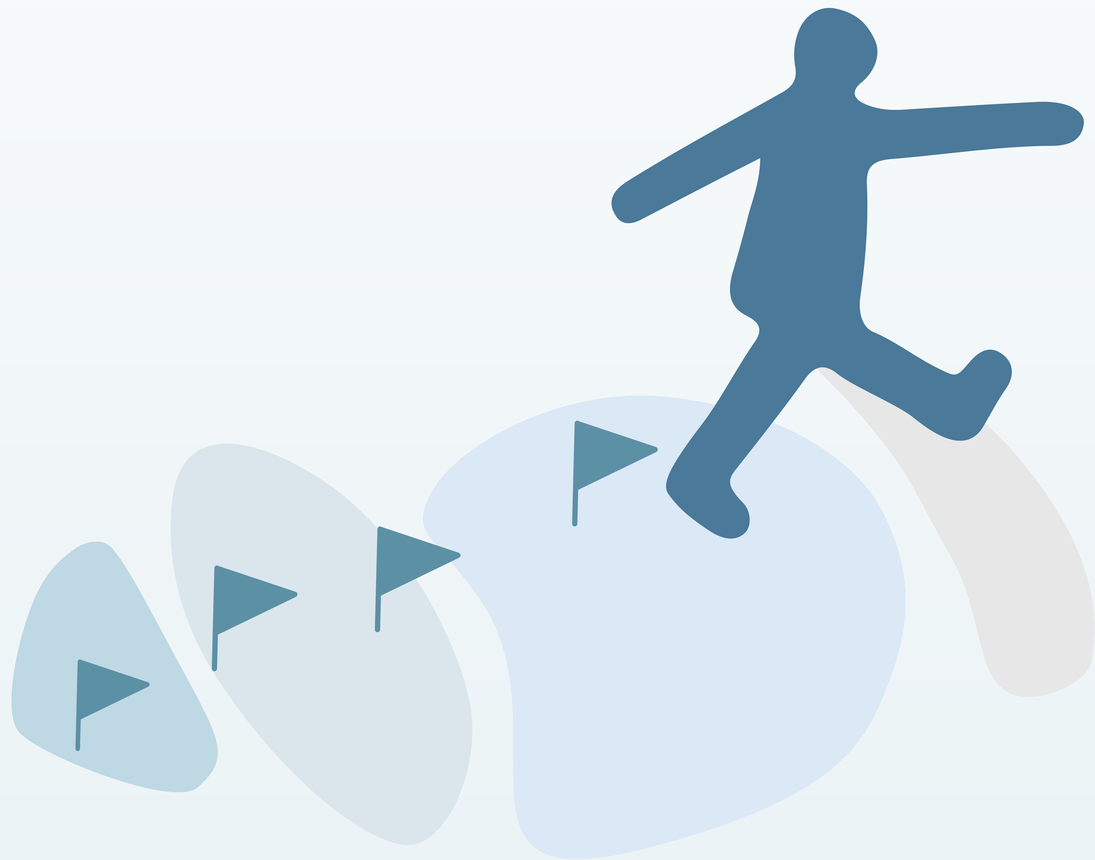
Empowering Reading:
A Tool to Boost Novice Designers' Motivation for Design Books

Jingyi Zhao

Master Thesis

Design for Interaction



Master Thesis

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A Tool to Boost Novice Designers' Motivation for Design Books

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Preface

This project is my graduation project which represents the end of my student life. I think it is an incredible learning experience, and I could not have achieved this milestone without the help of many people.

First and foremost, I would like to express my deepest gratitude to my supervisory team for guiding and encouraging me throughout this journey. Thank you, Ianus, for inspiring me with your critical insights and your extensive professional knowledge in the design field. Your sharp observations have significantly shaped my thinking. Thank you, Jeff, for providing me with diverse resources that sparked my creativity and for always listening to my ideas with kindness and openness. It has been both a fun and inspiring experience working with you both.

A special thank you goes to my friend, Yuchen. Thank you for patiently listening to my thoughts and frustrations throughout the course of my graduation project. Your valuable insights was helpful in refining my work. More importantly, your support and encouragement have been a tremendous source of psychological comfort and reassurance, helping me stay motivated and persistent.

Last but not least, to my parents, thank you for your constant encouragement, patience, and love.

This project is a reflection of the collective effort and support of all these individuals, and I am truly thankful for each and every one of you.

With deepest gratitude
Jingyi Zhao

Executive Summary

Reading is a cornerstone of intellectual growth and a vital skill for thriving in society. In the realm of design education, design-related books serve as crucial resources for novice designers, offering both in-depth knowledge and practical insights. However, in an era where information is increasingly consumed through digital channels like videos, podcasts, and social media, the traditional role of reading is under threat. Despite the wealth of information available online, the depth and credibility provided by books remain unparalleled. Yet, as research shows, many design students struggle with maintaining motivation to read, often finding the material daunting or unengaging. This raises a critical question: how can we motivate novice designers to engage with design books and sustain their reading habits in a digital age?

This project sought to address this challenge through comprehensive research, including literature reviews on reading motivation and gamification, as well as context mapping studies. The research identified several key obstacles faced by novice designers and pinpointed effective strategies to boost motivation. It became evident that while increasing engagement is crucial, fostering a sense of knowledge-building and self-growth significantly enhances the perceived value of reading, turning it into a more fulfilling activity.

The whole design process evolved through continuous iterations, culminating in the development of **Milegrow**, a unique concept that integrates physical milestones with a digital design growth map. Milegrow encourages readers to reflect, connect ideas, and track their progress, ultimately fostering a deeper engagement with the material.

Key features of Milegrow include:

- **Physical Milestones**: These break the book into manageable sections, giving readers a sense of control and progress.
- **Reflective questions**: Embedded within milestones, these prompts stimulate deep reflection, making the reading experience more engaging and thought-provoking.
- **Record thoughts and reflections**: This helps deepen the understanding of the content, thereby maximizing the utility value of the book.
- **Design Growth Map**: A digital tool that collect reflections and tracks intellectual growth across various design fields.

Final evaluations revealed that Milegrow effectively enhances the reading experience by making it more engaging, thought-provoking, and reflective. It also fosters a sense of knowledge-building and self-growth, thereby increasing motivation. However, it was noted that the success of this tool depends on the content of the design book itself; if the book lacks utility or is too dull, Milegrow may not fully compensate.

Table of Contents

Chapter 1
Introduction

This chapter provides an overview of the project background, explaining why I chose to focus specifically on reading motivation for design books and why novice designers were selected as the target group. It also offers a detailed explanation of the project scope, including the project's aim, target audience and stakeholders, book selection criteria, and research questions.

Chapter Overview

1.1 Project Background

Reading is a fundamental skill essential for successful participation in society. In the realm of design, continuous learning and knowledge acquisition are essential for the growth and development of novice designers. Tim Brown, in his book *Change by Design*, emphasizes that design thinking is a continuous process that requires ongoing learning and adaptation. Design books serve as invaluable resources in this journey, offering foundational theories, practical insights, and real-world examples that are crucial for honing design skills and expanding creative horizons.

However, as technology advances and information channels increase, the role of reading as a primary way for acquiring knowledge has been repeatedly challenged. Students can now obtain information from search engines, multimedia platforms like videos, podcasts, and even social media. The book-based learning approach is gradually evolving into e-learning, mobile learning, and ubiquitous learning (Peña-Ayala and Cárdenas, 2016). Research conducted by Huang, Capps, Blacklock, and Garza (2014) suggests that college students dedicate less time to academic reading, often favoring social media engagement over reading activities. In addition, from the educator's perspective, it is also becoming increasingly difficult to assign academic reading to students. Professors report that students' compliance with assigned readings is considered low (Starcher and Proffitt, 2011).

Although design students can gain design-related knowledge through these other channels, the value of books remains irreplaceable. Books are typically authored by experts in the field, ensuring the credibility, depth, and breadth of information which can be harder to verify in other sources such as videos or social media posts. Therefore, it is meaningful to explore how to stimulate and retain reading behaviors.

Figure 1. Lack of reading motivation

Current research gap

Understanding reading motivation is critical in this context, particularly in educational settings where a lack of motivation may contribute to decreased engagement with reading. A significant body of research has highlighted the strategic effort and motivation required for effective reading.

Since the early 20th century, reading motivation has been a major research topic, especially among secondary school students (Huang and Reynolds, 2022). However, the study of college students' motivation to read remains relatively underdeveloped (Lin, Wong, & McBride-Chang, 2012). Given that many novice designers are college students, investigating their motivation to engage with design books presents an opportunity to address this research gap.

1.2 Project Scope

1.2.1 Project Aim

This project aims to **understand the motivation of novice designers to engage with design books** and **enhance their reading motivation** through the design intervention, thereby facilitating their **professional growth** as designers.

Furthermore, the project encompasses research and exploration into **gamification**. The concept of gamification extends beyond game creation, permeating various aspects of life—from education, work, marketing, all the way to healthcare and scientific research (Chou, 2016). Due to its remarkable ability to sustain engagement, gamification aligns closely with this project's objectives. Consequently, the project will also **explore the potential of the Octalysis System**, a prominent gamification framework, in **enhancing reading motivation**.

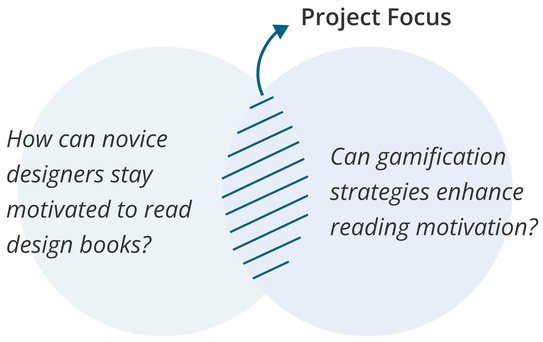


Figure 2. Project focus

1.2.2 Target Group & Stakeholders

The target group of this project is novice designers aged from 18 to 25 years old who hope to gain some knowledgement from design books. Given their recent introduction to design, this group has relatively limited design-related knowledgement and also the understanding of design.

Although this project focuses more on those who lack motivation to read, it does not impose strict limitations on motivation. As long as they have a need to read design books—whether due to personal interest or external factors such as academic requirements—they are considered within the project's target group.

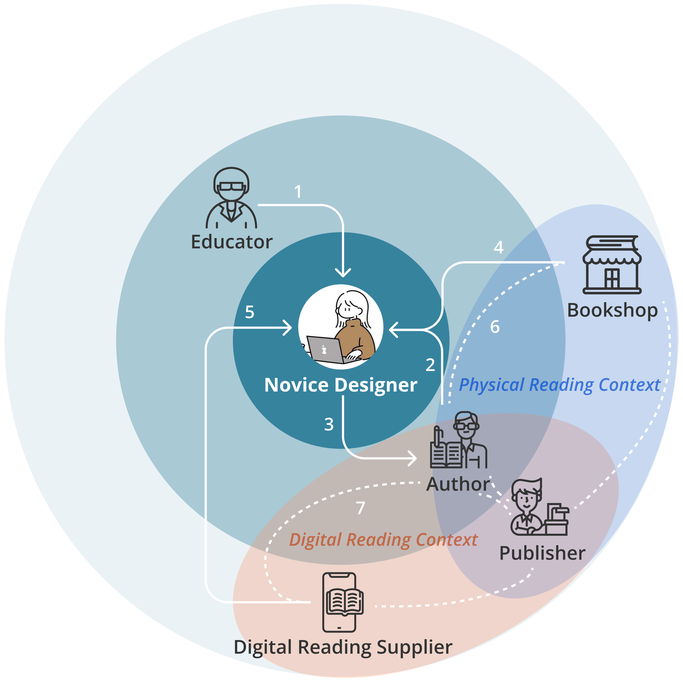
Novice Designers **18-25 years old**

Have limited design-related knowledge

Have a need to read design books

Lack of motivation for reading

Figure 3. Persona of target group



1. Educators recommend reading materials and engage students with course materials
2. Authors provide content related to design
3. Novice designers provide feedback about books
4. Bookshops serve as a physical space where novice designers can browse and purchase books
5. Digital suppliers offer convenient access to design books
6. Authors collaborate with publishers and bookshops to produce and distribute books
7. Authors collaborate with publishers and digital suppliers to offer books in digital formats

Figure 4. Stakeholder map

In addition to novice designers, who serve as the primary focus group, several potential stakeholders have distinct interests and interconnected relationships. Given that most novice designers are design students, educators, including professors, are key stakeholders. They are interested in effective teaching methods and ensuring student engagement with the course materials. Professors often recommend design books, helping students discover valuable resources. Authors of design books are also important stakeholders. They aim to share their expertise and insights, contributing to the field while gaining recognition and readership.

Considering the feasibility of this project, publishers and bookshops can be relevant stakeholders if it is in the context of physical reading. Publishers are focused on producing and distributing high-quality content, ensuring books reach a wide audience. They collaborate closely with authors to achieve this goal. Bookshops provide a physical space for browsing and purchasing, appealing to readers who prefer tangible books, while also maintaining relationships with publishers to stock popular titles.

In the context of digital reading, digital reading suppliers become significant stakeholders. They offer convenient access to digital formats, catering to modern readers' preferences and working with publishers to ensure a broad selection of titles.

Understanding the interplay between these stakeholders, including their interests and relationships, is essential for developing effective strategies in the real word setting.

1.2.3 Book Selection

The term 'design books' in this project refers to books containing knowledge related to design, such as foundational theories, design skills, and design history. Given that all testing and design validations will take place within the Industrial Design program at TU Delft, the design books used to create prototypes will be limited to the categories of industrial design and product design.

Furthermore, given that novice designers have relatively limited design knowledge and familiarity with the field, most of the selected books are introductory-level, such as Don Norman's 'The Design of Everyday Things,' avoiding specialized academic papers. Some of the books used for prototype testing are sourced from the 'Literature and Study Materials' section of the undergraduate industrial design courses on the TU Delft Studyguide website.

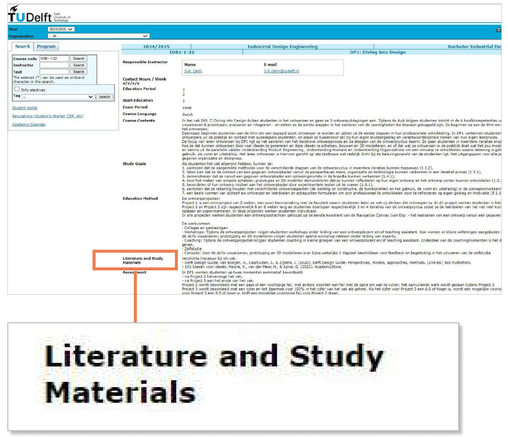


Figure 5. TU Delft Studyguide website

1.2.4 Research Questions

Reading motivation related

1. What is the classification of motivation? Which types of reading motivation are suitable to be applied in this project?
2. What motivates and dismotivates novice designers to read design books?
3. What theoretical models of reading motivation can be applied to develop effective frameworks for enhancing reading motivation?
4. How can gamification framework be applied to enhance reading motivation?

Reading experience related

1. What's novice designers' reading behavior pattern?
2. How do they perceive the current reading experience?
3. What's their ideal reading experience?

Chapter 2
Project Approach

This chapter outlines the primary approaches used in this project, covering both the research and design methodologies. It begins with an overview of the entire project process, followed by a detailed explanation of the specific approaches I adopted and the rationale behind their selection.

Chapter Overview

2.1 Overview Project Process

The map below shows the research and design approaches throughtout the project. The process of the project can be summarised as four phases: Contextual Exploration, Design Exploration, Learning by Doing, and Final Design and Validation.

The first diamond is the contextual exploration phase. In this phase, I explored the theoretical background on reading motivation and gamification framework. In addition, the context mapping research methodology was adopted in the user research, and it will be explained in detail in the following pages.

In the second diamond, design opportunities was identified from the key insights from the first phase. Based on that, I conducted a self-brainstorming session and mapped all small ideas into the Octalysis System.

In the iterative cycles, design iterations was done by repeating prototyping, user testing and evaluation. This learning by doing approach will be well explained later in this chapter. After first iteration cycle, the final design direction was chosen and the design goal was reframed to be more specific. In the second iteration cycle, feasibility was taken into account and main features of the final concept were determined.

After two major iteration cycles, the specific features of the final concept were further refined in the final phase through self-testing. The final design concept and prototype were then evaluated through role-playing with novice designers in a real-world context. Following this, the overall project evaluation included an assessment of the design goal and a comprehensive evaluation of the overall trajectory.

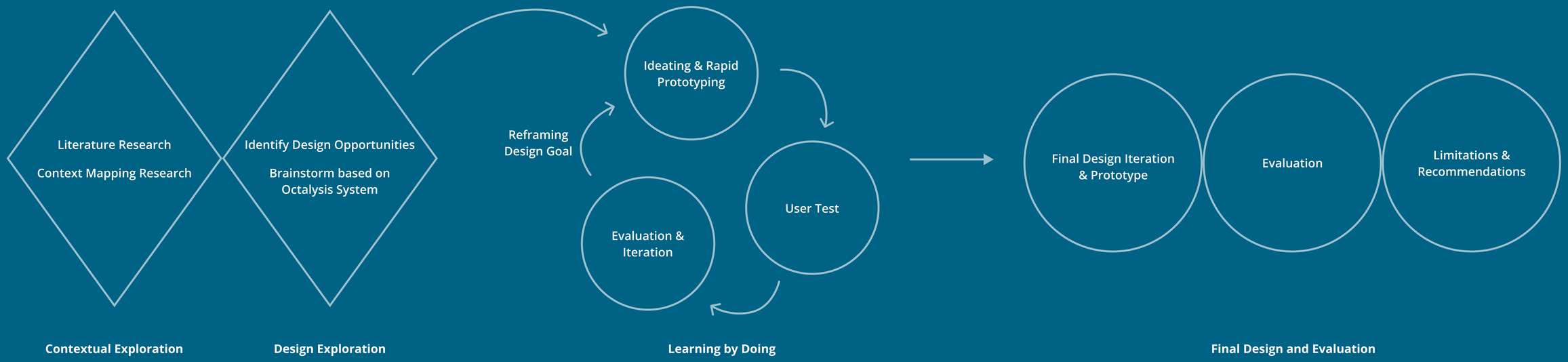


Figure 6. Overview project process

2.2 Research Approach

2.2.1 Literature Review

Literature review was conducted throughout the project to gain insights on the reading motivation, gamification framework and different mindsets of note-taking.

The purpose of conducting a literature review in my project is to provide theoretical support for my design. However, the literature review primarily serves as a supplementary tool in the design process, rather than being the main research method.

The first reason is that the literature I used often addresses a broad audience and not specifically my target group, making the insights not fully applicable to the project's specific context and audience. Therefore, I do not rely solely on insights from the literature for my design decisions.

Furthermore, given that my project is a design project rather than a research project, my focus is more on the subjective experiences and feelings of the target group. Design and prototyping can act as effective tools to delve into these user experiences and feelings, aspects that literature and theoretical research alone cannot fully capture.

Interestingly, some insights derived from theoretical research overlap with findings obtained from in-depth studies of the context and target group. This convergence enhances the credibility of these insights.

2.2.2 Context Mapping

The method contextmapping was used as the primary research approach to obtain contextual information by evoking past memories and eliciting future imagery (Visser & Stappers, 2005). By focusing on the actual context, this method provides rich, qualitative data that reveals nuanced behaviors, motivations, and challenges faced by novice designers. This depth of insight is why I chose this approach.

While context mapping in the group form allows participants to build on each other's ideas and provide broader perspectives, reading is more an individual activity with highly varied experiences from person to person. To delve deeply into the complete journey of each participant—before, during, and after reading—I chose the one-on-one format. This form allows for a more focused and in-depth exploration of each individual's story, making it better suited for understanding reading experiences of them.

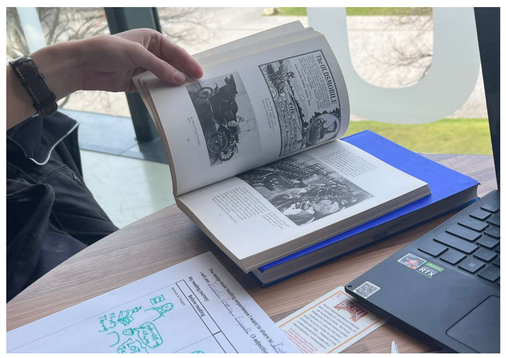


Figure 7. Context mapping session

2.3 Design Approach

2.3.1 Learning by Doing

During the design process, I adopted the 'learning by doing' methodology, inspired by the experiential learning theory outlined by David Kolb (1984) in *Experiential Learning*: Experience as the Source of Learning and Development. This approach, which I was firstly introduced to in the Interactive Technology Design (ITD) course—a core component of the MSc Design for Interaction Programme—involves gradually building the design through repeated rough prototyping and testing, allowing for continuous iteration and improvement.

Given that the project's theme is to boost novice designers' reading motivation, it is more aligned with designers' everyday life rather than a purely academic research topic. Design and prototyping themselves can be excellent tools to explore the real-life context and communicate with the target group. The specific reasons for adopting this approach are:

1 To understand the context and the target group
One of the most important lessons I learned in my graduate studies is to embrace ambiguity and unexpected discoveries with an open mind, rather than solely focusing on the final design outcome. The purpose of quick prototype iteration is not just to create a better product but to serve as a probe that helps me understand the behaviors, experiences, feelings and challenges faced by novice designers in the reading process. This 'learning by doing' approach enriches the research by providing deeper insights.

2 Flexibility and Adaptability
Compared to developing sophisticated concepts and creating high-fidelity models, this approach of rough prototyping and frequent testing offers greater flexibility and efficiency. As new insights emerge, the design can be quickly adapted.

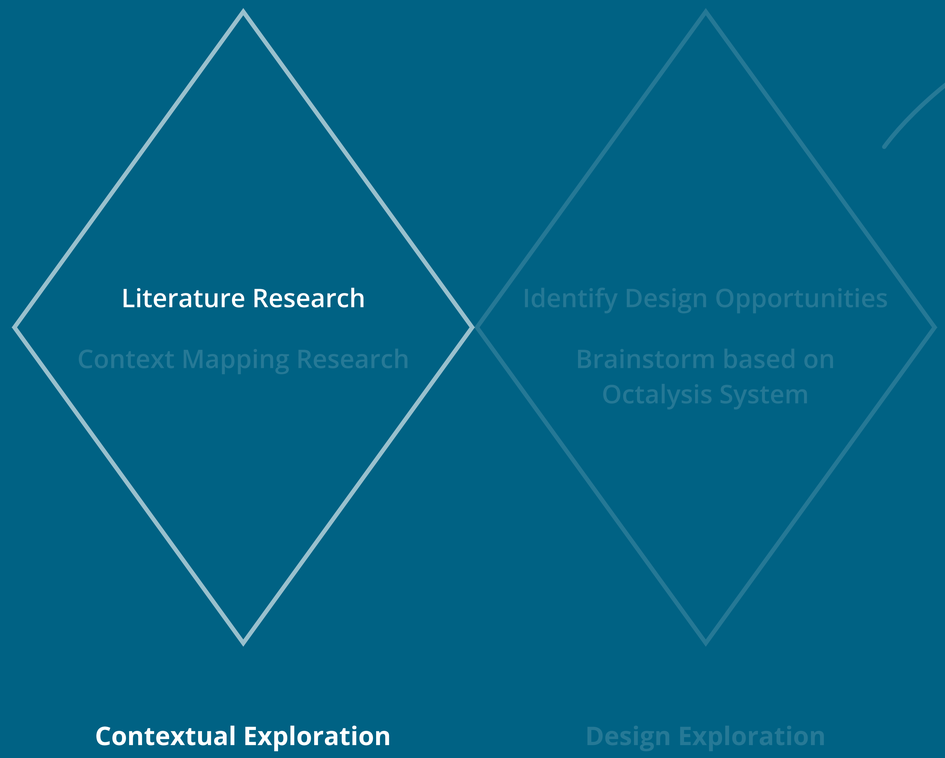
3 To communicate ideas to audiences
When effectively conveying and explaining ideas to the audience is challenging, prototypes can serve as an effective communication tool. They enable clearer comprehension of ideas and foster deeper discussions about the concept and its potential development.

Figure 8. User test in 'Learning by Doing' phase

Although this approach provided many valuable insights, I found it challenging to balance refining existing elements with exploring new ideas. During the iterative testing process, I sometimes focused too much on specific details, neglecting broader design considerations.

Chapter 3
Literature Research

The literature review is divided into three main sections: the theoretical background on reading motivation, research on gamification frameworks, and studies related to note-taking mindsets. In the first section, various theoretical models of reading motivation are explored to identify frameworks that can inform potential intervention strategies. For the gamification framework, I focused on the Octalysis System, detailing why I chose it, what it entails, and how it is applied in my project. The section on note-taking mindsets provides a foundation for understanding the rationale behind the subsequent design decisions.



Chapter Overview

3.1 Theoretical Background on Reading Motivation

The root of the term 'motivation' lies in the Latin word 'moveo,' which translates to 'to move.' Essentially, motivation means being moved to engage in an action (Ryan and Deci, 2000). Almost all intentional human actions are driven by motivation, and reading is no different. Reading motivation, according to Conradi, Jiang and McKenna (2014), can be defined as 'the drive to read resulting from a comprehensive set of an individual's beliefs about, attitudes towards, and goals for reading'.

There have been many studies confirming that students who have higher motivation to read will read more often and have better reading comprehension ability (van der Sande et al., 2023). However, increasing people's reading motivation is not an easy task. One of the challenges is that different types of motivation can have different impacts on behaviour and need to be considered thoroughly and carefully. Moreover, motivation to read is a multidimensional construct, shaped by various factors which are often interrelated and mutually influential (McGeown et al., 2015).

Therefore, in order to gain a deeper understanding of reading motivation and pinpoint effective frameworks for enhancing it, firstly classification of motivation was studied, and then different theoretical models related to reading motivation were explored and described.

3.1.1 Classification of motivation: Intrinsic VS. extrinsic motivation

People can be driven to read by various factors. Some are motivated by a genuine love for reading or find it inherently interesting, while others are prompted by personal goals or external pressures, such as meeting a professor's requirements or passing a course. These differences illustrate two types of reading motivation: intrinsic and extrinsic motivation (Ryan & Deci, 2000).

Intrinsic and Extrinsic Motivation

Intrinsic motivation refers to reading for its own sake—out of interest or as a favorite activity (Ryan & Deci, 2000). It is often associated with curiosity, interest, a preference for challenges, and involvement. Extrinsic motivation, on the other hand, is driven by the desire to achieve a separable outcome or comply with external regulations (Ryan & Deci, 2000). Examples include reading for tangible rewards or due to the pressure of course deadlines.

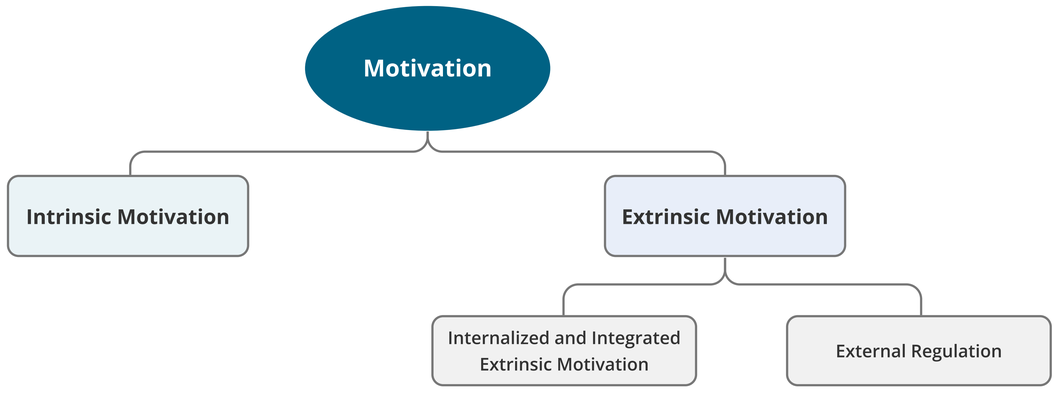


Figure 9. Classification of motivation

Comparison of Intrinsic and Extrinsic Motivation

Extrinsic motivation can sometimes outperform intrinsic motivation in achieving specific outcomes, such as the stronger memorization of literal information from passages (Guthrie, McRae, & Klauda, 2007). However, the long-term effects of these motivations differ significantly. Intrinsic motivation proves more effective over time, as prolonged reliance on external constraints can diminish autonomy and undermine motivation (Ryan & Deci, 2000), leading to less sustainable learning habits.

Furthermore, experiments indicate that increased external regulation correlates with lower levels of interest, perceived value, and effort toward reading, and a tendency to avoid responsibility for negative outcomes (van der Sande et al., 2023). This suggests that intrinsic motivation fosters a more positive and enduring engagement with reading.

A promising middle ground: Internalized and Integrated Extrinsic Motivation

Ryan et al. (1997) propose a more effective form of extrinsic motivation: internalized and integrated extrinsic motivation. This type involves individuals finding personal meaning and rationale for engaging in activities that may not inherently interest them. For instance, students may read because they recognize its value to their career, thereby internalizing and identifying with the extrinsic motivation. Benefits of greater internalization include enhanced behavioral efficacy, increased perseverance, and improved subjective happiness (Ryan et al., 1997). This promising middle ground combines the immediate benefits of extrinsic motivation with the enduring advantages of intrinsic motivation, offering a comprehensive strategy for fostering sustained engagement and achievement.

Implications for Reading Behavior

Given that reading is a long-term activity, solely relying on external regulations or rewards (such as incentives and punishments) is insufficient. Intrinsic motivation is crucial for initiating reading, engaging in the process, and internalizing knowledge. However, creating intrinsic motivation for those disinterested in reading is challenging, particularly with design books that are meant for professional growth rather than entertainment. Therefore, fostering intrinsic motivation alone is inadequate; enhancing internalized extrinsic motivation is also necessary to help readers perceive the personal value and meaning of reading.

3.1.2 Reading motivation theories

To understand the factors affecting reading motivations and their mutual influences, several motivation theories were studied. Some theories focus primarily on intrinsic motivation, such as the Interest Theory, while others involve both intrinsic and extrinsic motivation.

Self-Determination Theory (SDT)

Proposed by Deci and Ryan (2000), Self-Determination Theory (SDT) states that human beings have a natural tendency to grow and develop. The theory identifies three basic factors related to motivation: competence, autonomy, and relatedness.

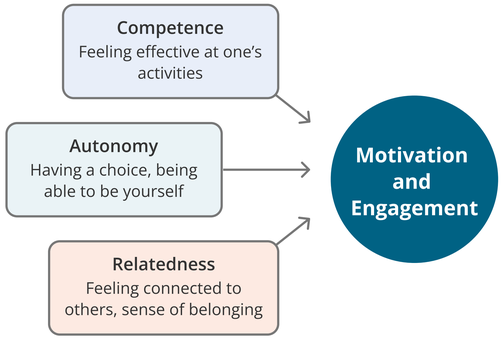


Figure 10. Constructs of SDT (Deci and Ryan, 2000)

- **Competence**: The feeling of being effective at one's activities. In reading, this is associated with the perceived difficulty of texts, realistic goal setting, and frequent feedback regarding success (Guthrie, McRae, & Klauda, 2007).
- **Relatedness**: The feeling of connection to others and a sense of belonging. In reading, it means seeing the connection between school reading and real life (Guthrie, McRae, & Klauda, 2007).
- **Autonomy**: The perception of having a choice and feeling that behavior is under one's control. Respecting the user's autonomy is important and can increase their motivation (Chou, 2016).

Autonomy is a critical factor, as acknowledging users' autonomy can significantly enhance their motivation and engagement. This perspective is underscored by Chou (2016) in 'Actionable Gamification,' where he highlights that the perception of choice can empower individuals, regardless of the actual significance of the options (Chou, 2016). Chou (2016) asserts, 'The key to the Choice Perception is that the choice itself is not necessarily meaningful, but merely makes a person feel like they are empowered to choose between different paths and options.'

Nevertheless, "The Paradox of Choice" cautions against assuming that autonomy and freedom necessarily inspire action. In his book, Schwartz (2004) points out that autonomy characterised by having lots of choices can lead to indecisiveness and self-doubt, which ultimately affects their satisfaction with their decisions.

Therefore, while it is important for users to feel empowered to make choices, simply providing more choices does not necessarily increase autonomy and motivation. In the design process, a delicate balance needs to be struck to ensure that a sense of autonomy is fostered without overwhelming users.

Interest Theory

Interest Theory suggests that motivation is triggered by preferences for certain topics or activities (Schiefele, 1991). Interest can be situational or individual.

- **Situational Interest**: Triggered by environmental stimuli, it can motivate a person to start reading (Hidi & Renninger, 2006).
- **Individual Interest**: A stable characteristic of a person, requiring positive emotions, stored knowledge, and values for long-term engagement.

For book reading, eliciting situational interest can be sufficient to prompt individuals to start reading, but to sustain it, readers must find the activity meaningful and be willing to remain engaged. Building individual interest can provide a more stable motivation for continuous reading, but it also demands more stringent conditions, requiring readers to perceive knowledge building and a heightened sense of value.

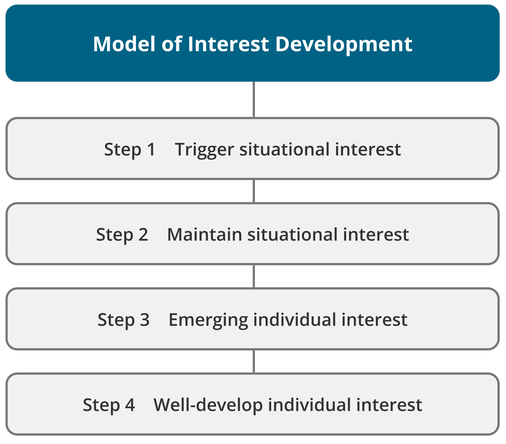


Figure 11. 4 phases of interest development (Schiefele, 1991)

Expectancy-Value Theory

Expectancy-Value Theory suggests that students' motivation and achievement are most closely related to expectancies of success and subjective task value (Wigfield & Eccles, 2000).

- **Expectancies**: Confidence in one's ability to complete tasks.
- **Subjective Task Value**: Importance, usefulness, or enjoyment of the task, including attainment value (related to personal identity), intrinsic value (linked to enjoyment or interest), utility value (associated with usefulness or relevance), and cost (incorporating factors like time loss, excessive effort and stress).

Students are more motivated to read when they believe they have the ability to complete the reading and can perceive the intrinsic value and utility value of reading to themselves.

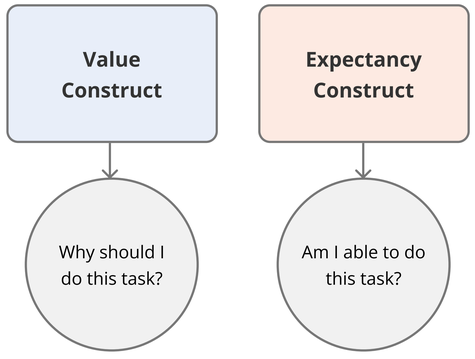


Figure 12. Constructs of Expectancy-Value Theory (Wigfield and Eccles, 2000)

Reading Engagement Model (REM)

The Reading Engagement Model integrates multiple reading motivation theories, including SDT, Achievement Goal Theory, and Social Cognitive Theory.

- **5 Key Constructs:** Intrinsic motivation, perceived autonomy, self-efficacy, collaboration, and mastery goal pursuit (Guthrie, McRae & Klauda, 2007).

Given the discussion of intrinsic motivation, perceived autonomy and self-efficacy in previous sections, I will focus here on collaboration. Guthrie, Mcrae, and Klauda (2007) define collaboration in the educational context as students' social interactions during reading, encompassing group work, text discussions, and prosocial goals related to school reading activities. Their research illustrates that collaborative structures enhance students' perception of social support and improve performance in reading comprehension tasks. Collaborative reading activities are also enjoyable and have the potential to increase intrinsic motivation (Guthrie, Mcrae, and Klauda, 2007).

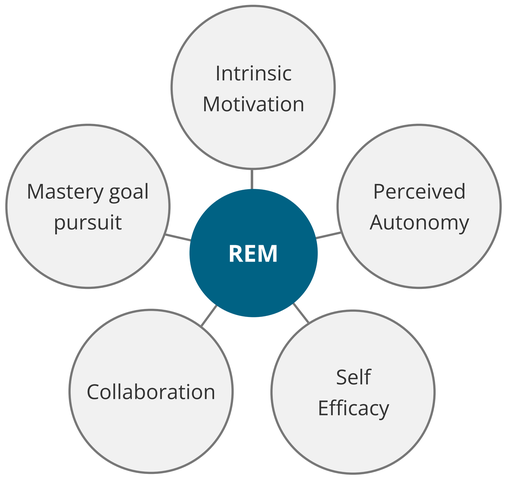


Figure 13. Constructs of REM (Guthrie, Mcrae and Klauda, 2007)

Conclusion

Given that reading is more like a long-term behavior, intrinsic motivation proves more enduring. Relying solely on external rugulations can weaken autonomy and diminish long-term engagement with reading. However, in the context of reading design books, interest may not be inherent, and for such individuals, cultivating intrinsic motivation from scratch could be not so realistic. Moreover, the non-entertainment nature of design books also makes them less suitable for being deconstructed into an entertaining product which can easily spark interest.

Still, research suggests a nuanced approach: internalized extrinsic motivation, where individuals find personal meaning in reading, offers a promising middle ground. For most readers, a combinition of intrinsic and internalized extrinsic motivation has the potential in sustaining reading interest.

Within the reading motivation theories above-cited, it can be observed that some motivational theories encompass not only constructs related to intrinsic motivation but also those related to extrinsic motivation and internalized extrinsic motivation. Some of these constructs can be seen as requirements for designed interventions later, while others can be seen as opportunities. In the following part, the requirements and opportunities that overlap or belong to each other are clustered into themes.

The overview of design opportunities and requirements for reading motivation can be seen in Appendix A.

Opportunities for enhancing motivation

1. Triggering situational interest

- Getting individuals curious about books can motivate them to start reading
- Enhancing individuals' perception of the personal relevance of reading can attract them to engage in reading

2. Perceiving value of reading

- Enhancing perceived attainment value which is related to personal identity
- Enhancing the intrinsic value by making reading more enjoyable and interesting
- Enhancing the utility value by increasing the usefulness of reading design books

3. Promoting personal growth

Providing interaction and challenge which can stimulate continuous engagement and help knowledge building

4. Collaborating

Creating opportunities for individuals to provide mutual support to each other

Requirements for ensuring motivation

1. Perceived Autonomy

Empowering readers with a sense of choice without overwhelming them.

2. Sense of Competence/Self-efficacy

- Individuals need to be confident in their reading ability and believe that their skills are adequate to reading tasks
- Perceived difficulty of the reading as less difficult
- Frequent feedback regarding success could enhance sense of competence

3.2 Gamification: Octalysis System

In this section, I will introduce the gamification framework used in Chapter 5 for brainstorming ideas. This includes explaining why I chose to incorporate gamification, what the Octalysis System is, and how it can be applied to my project.

3.2.1 Why Use Gamification

In recent years, gamification has reached a tipping point, infiltrating various aspects of our lives, from education and work to marketing, sustainability, healthcare, and scientific research (Chou, 2016). Given its widespread potential in different areas, incorporating gamification into my project felt both timely and relevant.

From a personal standpoint, I see gamification not just as entertainment, but as a powerful tool for personal and collective growth. It can transform mundane activities into engaging and valuable experiences. Reading, especially for those who lack motivation, can often be solitary and tedious. While some argue that serious reading shouldn't be gamified, I believe there's potential to explore how gamification can enhance the reading experience.

By integrating gamification elements, such as those outlined in the Octalysis System, I aim to make reading more engaging, thought-provoking, and rewarding. This project seeks to test whether gamification can sustain interest and motivate deeper reflection, ultimately bridging the gap between traditional reading and interactive, dynamic experiences.

3.2.2 What the Octalysis System Is About

The Octalysis System, developed by Yu-kai Chou (2016), is a comprehensive framework that breaks down the various elements of gamification into eight core drives:

1. **Epic Meaning & Calling**: Users feel they are doing something greater than themselves.
2. **Development & Accomplishment**: Users feel a sense of progress, achievement, and mastery.
3. **Empowerment of Creativity & Feedback**: Users are engaged in a creative process where they repeatedly figure new things out and try different combinations.
4. **Ownership & Possession**: Users feel a sense of ownership and are motivated to improve and develop what they own.
5. **Social Influence & Relatedness**: Users are influenced by what others do, think, or say, and they feel related to those around them.
6. **Scarcity & Impatience**: Users want something because they can't have it right now.
7. **Unpredictability & Curiosity**: Users are engaged because they don't know what will happen next.
8. **Loss & Avoidance**: Users take actions to avoid something negative happening.

The system also categorizes these drives into two main types of tendency: extrinsic and intrinsic. Extrinsic tendency, driven by external rewards and recognition, is controlled by the left brain. This includes core drives such as Development & Accomplishment, Ownership & Possession, and Scarcity & Impatience.

In contrast, intrinsic tendency is driven by internal desires and personal satisfaction, managed by the right brain. This includes core drives like Empowerment of Creativity & Feedback, Social Influence & Relatedness, and Epic Meaning & Calling. These drives foster engagement through personal fulfillment, creativity, and social connections.

The Octalysis framework also distinguishes between white hat and black hat gamification. White hat gamification uses positive motivators such as Epic Meaning & Calling, Development & Accomplishment, and Empowerment of Creativity & Feedback. These elements encourage long-term engagement and a sense of well-being. Black hat gamification, however, involves more manipulative techniques like Scarcity & Impatience, Unpredictability & Curiosity, and Loss & Avoidance, which create urgency and pressure. While effective in the short term, over-reliance on black hat techniques can lead to negative feelings and burnout.

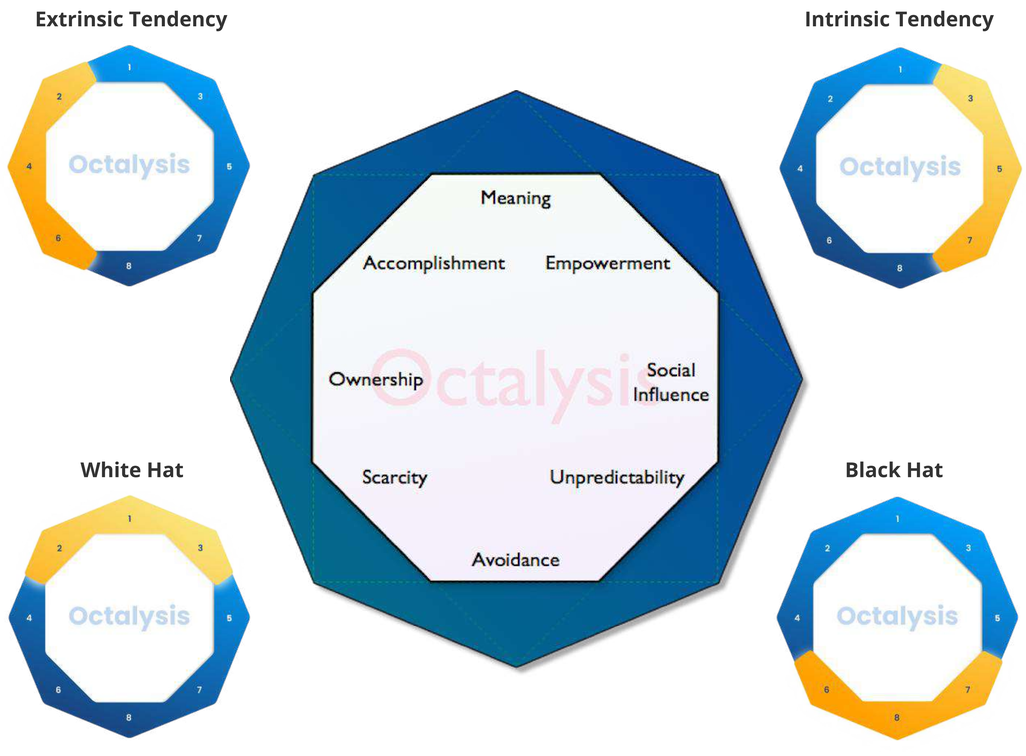


Figure 14. Octalysis System

3.2.3 Applying the Octalysis System to My Project

In this section, I will explain how I mapped the insights from context mapping in *Chapter 4* onto the Octalysis System, and how this combination guided the brainstorming of design ideas. Additionally, I will reflect on the outcomes and insights gained from applying this framework. For detailed explanations of insights from context mapping, please refer to *Chapter 4*, and for specific design ideas, see *Chapter 5*.

Mapping motivation boosters and barriers to the Octalysis System

In *Chapter 4*, through context mapping, I identified key insights categorized into motivation boosters and barriers relevant to enhancing reading engagement. These insights were segmented into core drives which aligned with the Octalysis System: Development & Accomplishment, Ownership & Possession, Social Influence & Relatedness, and Unpredictability & Curiosity.

Motivation boosters such as "Perceived utility value" and "Sense of progression" "Self-growth," "Achievement," and "Self-efficacy" were linked to the **Development & Accomplishment core drive**. This core drive emphasizes creating a sense of achievement and progress in the reading experience. For instance, incorporating a progress tracker or milestone system visually represents their journey through the book, fostering a sense of accomplishment with each milestone achieved.

As for **Social Influence & Relatedness core drive**, it underscores fostering community and social interaction around reading, enhancing motivation through shared experiences and supportive networks. Implementing features like collaborative annotation provides platforms for readers to share insights and support each other.

For the **Unpredictability & Curiosity core drive**, which emphasizes intrigue and the unexpected discoveries in maintaining engagement, introducing interactive elements like hidden content or quizzes related to the book's themes could enhance curiosity and offer surprises that keep readers engaged and eager to explore further.

Lastly, the **Ownership & Possession core drive** highlights the satisfaction derived from building a personal library. Creating a virtual book collection where readers can organize and earn rewards for their reading achievements could amplify this sense of ownership and fulfillment.

By mapping these insights onto the Octalysis System, I leveraged its framework to guide the brainstorming of design ideas. Each core drive provided a strategic lens through which I explored potential gamification techniques and interactive features aimed at enhancing reader motivation and satisfaction.

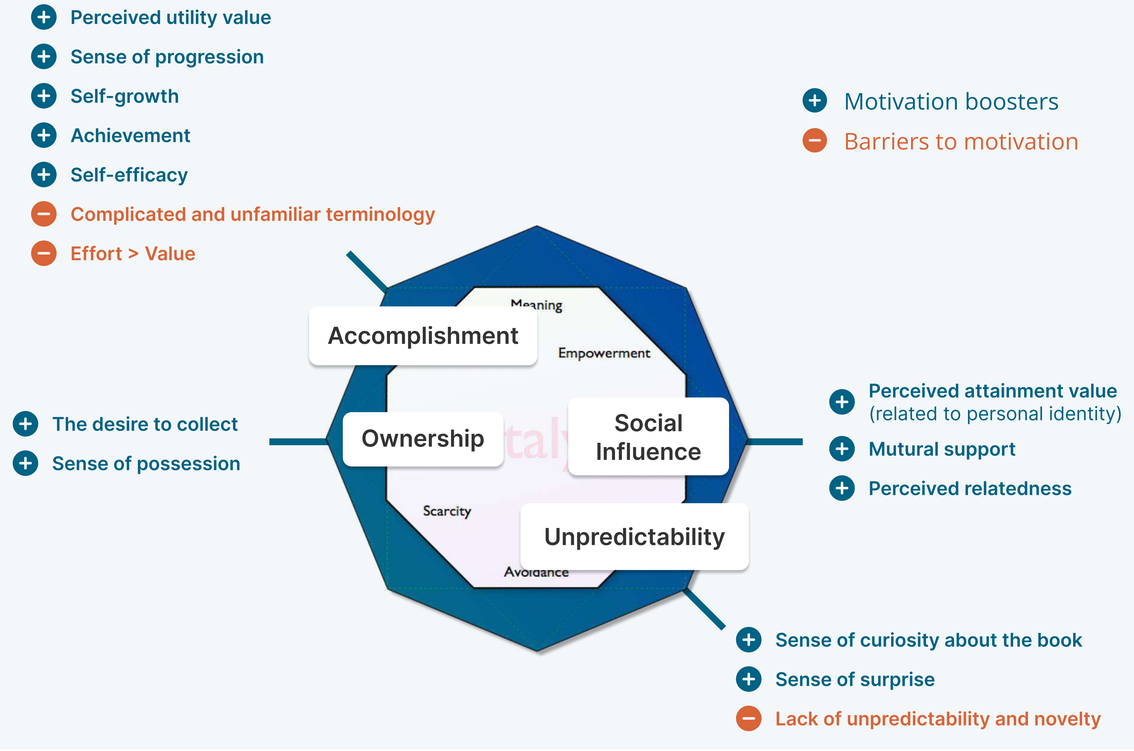


Figure 15. Mapping motivation boosters and barriers to the Octalysis System

Conclusion and Reflections

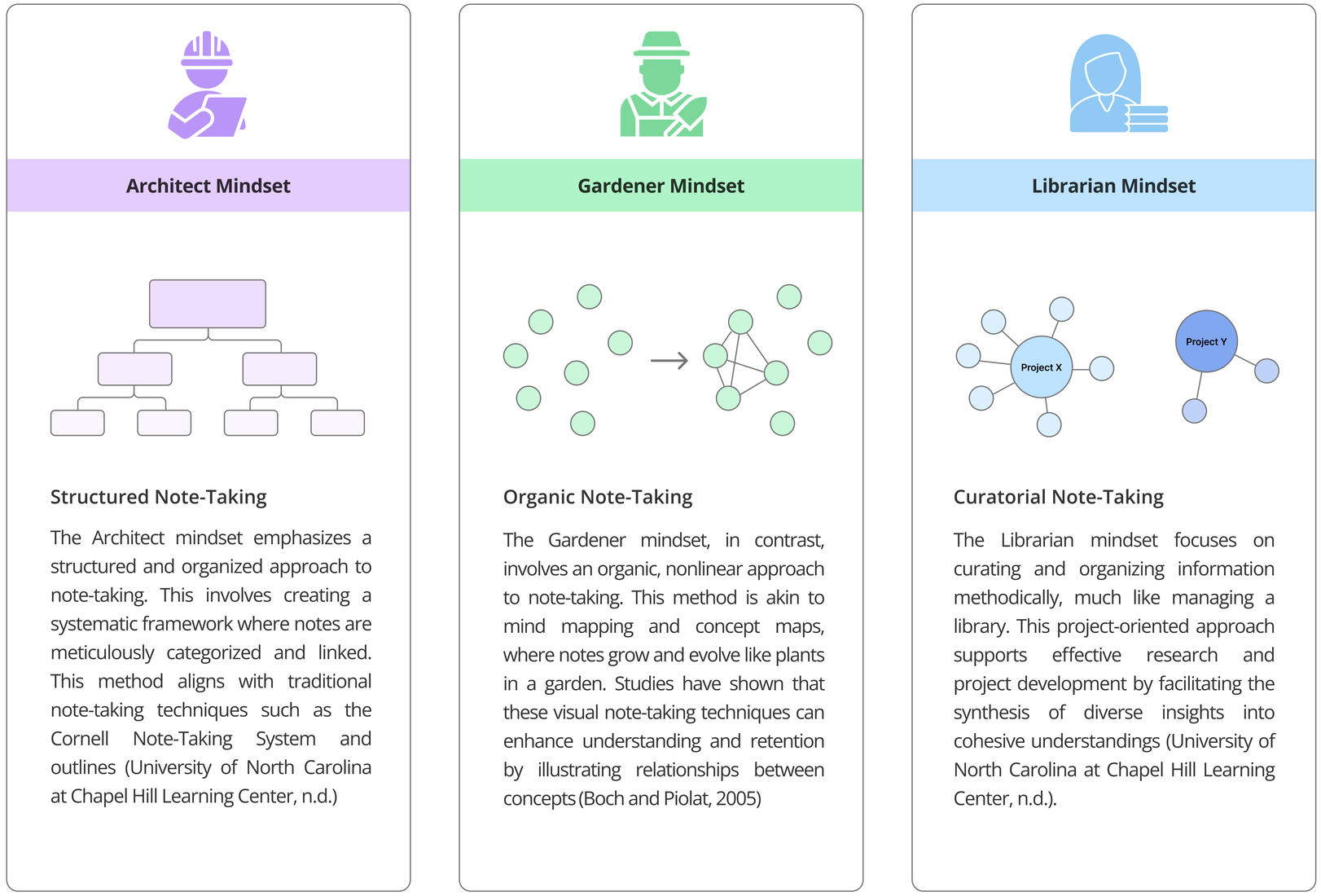
Mapping insights from context mapping onto the Octalysis System provided a structured framework for enhancing the reading experience through gamification. Despite its strengths, this approach has notable limitations. One significant challenge is ensuring that the gamification elements do not become distractions that detract from the reading experience. There is a risk that readers might focus more on gamification elements rather than engaging deeply with the content. In *section 6.3.2 Opportunities for Final Design,* I explained how to deal with this challenge through designing non-intrusive gamification features.

Furthermore, the application of the Octalysis System requires careful balancing of various game mechanics, which could introduce complexity. Balancing the emphasis across different core drives while ensuring that these elements were intuitive and seamlessly integrated into the reading process poses a significant challenge.

In summary, while the integration of the Octalysis System into the design of reading experiences offered promising avenues for enhancing reader motivation and engagement, it also highlighted the need for a balanced and flexible approach that carefully considers the diverse and complex nature of reading behaviors and preferences.

3.3 Mindset of Notetaking

The follow-up context mapping research revealed that note-taking is a common behavior when reading design books. Given that subsequent concepts also relate to note-taking, I will introduce different note-taking mindsets here to provide theoretical background for you to understand the ensuing designs. These mindsets—Architect, Gardener, and Librarian—each offer unique approaches to organizing notes.



Structured Note-Taking

The Architect mindset emphasizes a structured and organized approach to note-taking. This involves creating a systematic framework where notes are meticulously categorized and linked. This method aligns with traditional note-taking techniques such as the Cornell Note-Taking System and outlines (University of North Carolina at Chapel Hill Learning Center, n.d.)

Organic Note-Taking

The Gardener mindset, in contrast, involves an organic, nonlinear approach to note-taking. This method is akin to mind mapping and concept maps, where notes grow and evolve like plants in a garden. Studies have shown that these visual note-taking techniques can enhance understanding and retention by illustrating relationships between concepts (Boch and Piolat, 2005)

Curatorial Note-Taking

The Librarian mindset focuses on curating and organizing information methodically, much like managing a library. This project-oriented approach supports effective research and project development by facilitating the synthesis of diverse insights into cohesive understandings (University of North Carolina at Chapel Hill Learning Center, n.d.).

Figure 16. Three mindsets of note-taking

Discussion & Further Exploration

In contrast to the Gardener and Librarian mindsets, the Architect mindset adopts a top-down approach to note-taking. This method involves defining desired knowledge outcomes before reading, which encourages purposeful planning. However, outlining frameworks and categories clearly can be challenging, particularly for novice designers who have limited experience in the field. Consequently, they may struggle to articulate their reading goals effectively.

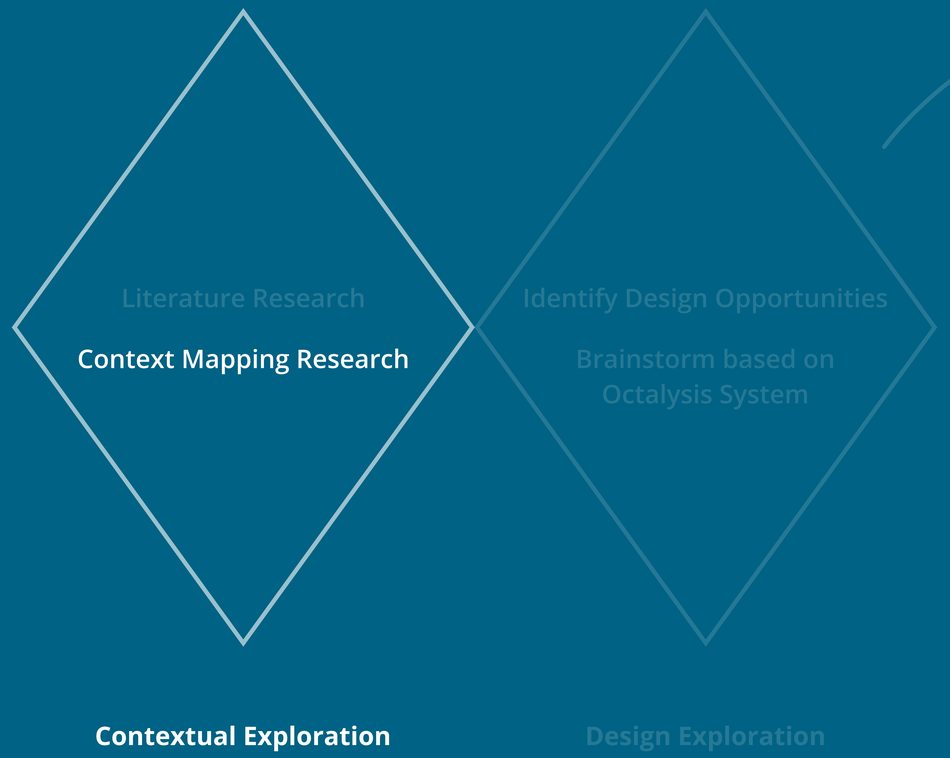
Conversely, the Librarian mindset offers greater flexibility. It does not require upfront planning or categorization; instead, all ideas are captured initially and then reviewed, refined, and organized into clusters. This approach may be more suitable for beginner designers who aim to collect and structure ideas from their reading.

For those who prefer collecting and organizing simultaneously, the Librarian mindset might be more suitable. They can employ simple classifications, such as related design projects or design themes, to tag their thoughts.

The exploration and validation of these mindsets in note-taking among novice designers will be elaborated upon in *Chapter 7*.

Chapter 4
Context Mapping Research

While literature research provides valuable insights into reading motivation, it typically targets a broader audience and general reading experiences. The specific behaviors and motivations of novice designers reading design books require further exploration through context mapping research to bridge the gap between theory and practice. The research results reveal insights into four themes: opportunities to naturally integrate design, motivation boosters for starting and sustaining reading, barriers to reading motivation, and desired features for ideal reading experiences. These insights address the research goals posed and will be the foundation of the development of design opportunities in Chapter 5.



Chapter Overview

4.1 Mapping Reading Motivations & Behaviors

Although literature research has provided many useful insights into people's reading motivations, people's specific behaviour patterns when reading design books remain under-researched, and the motivation for reading design books in the real-life context remains to be explored further. Therefore, to gain a deep understanding of target group's current reading experience and their expectations for future experience, a contextmapping research was conducted in this section.

4.1.1 Research goal

To learn

1. What's novice designers' current reading behavior pattern?
2. What motivates and dismotivates them to read design books?
3. How do they perceive the current reading experience?
4. What's their ideal reading experience?

4.1.2 Research Set-up

Participants

A total of 8 participants were recruited, including 5 undergraduate design students and 3 master's design students from the Industrial Design program at Delft University of Technology. Among them are book enthusiasts, as well as individuals who are less interested or completely uninterested in reading design books. The recruitment criteria is that the participants need to have some experience of reading design books, or at least have tried to read them.

The recruitment method involves posting the recruitment messages in the WhatsApp groups of first-year students, second-year students and graduate students. The aforementioned recruitment criteria was also included in the recruitment message.

Procedure

Overall, the contextmapping study conducted involves three parts: sensitizing exercise, narrative of a present/past reading journey, and collage of ideal reading journey.

- **Sensitization:** A sensitizing excercise was conducted on Miro and participents were required to complete the exercise before the generative session. The goal of the exercise is to familiarise them with the theme of the upcoming generative session and to stimulate their memories of past reading experiences.

- **Generative Session:** The sessions were conducted offline. During the sessions, participants were encouraged to verbally narrate and draw their past reading experiences based on some prompt questions, focusing on the design book they selected and brought with them. Premo tool was provided to help them express their emotions. After telling the stories, they were asked to create a collage representing their ideal design book reading experience using the tools prepared on Miro.

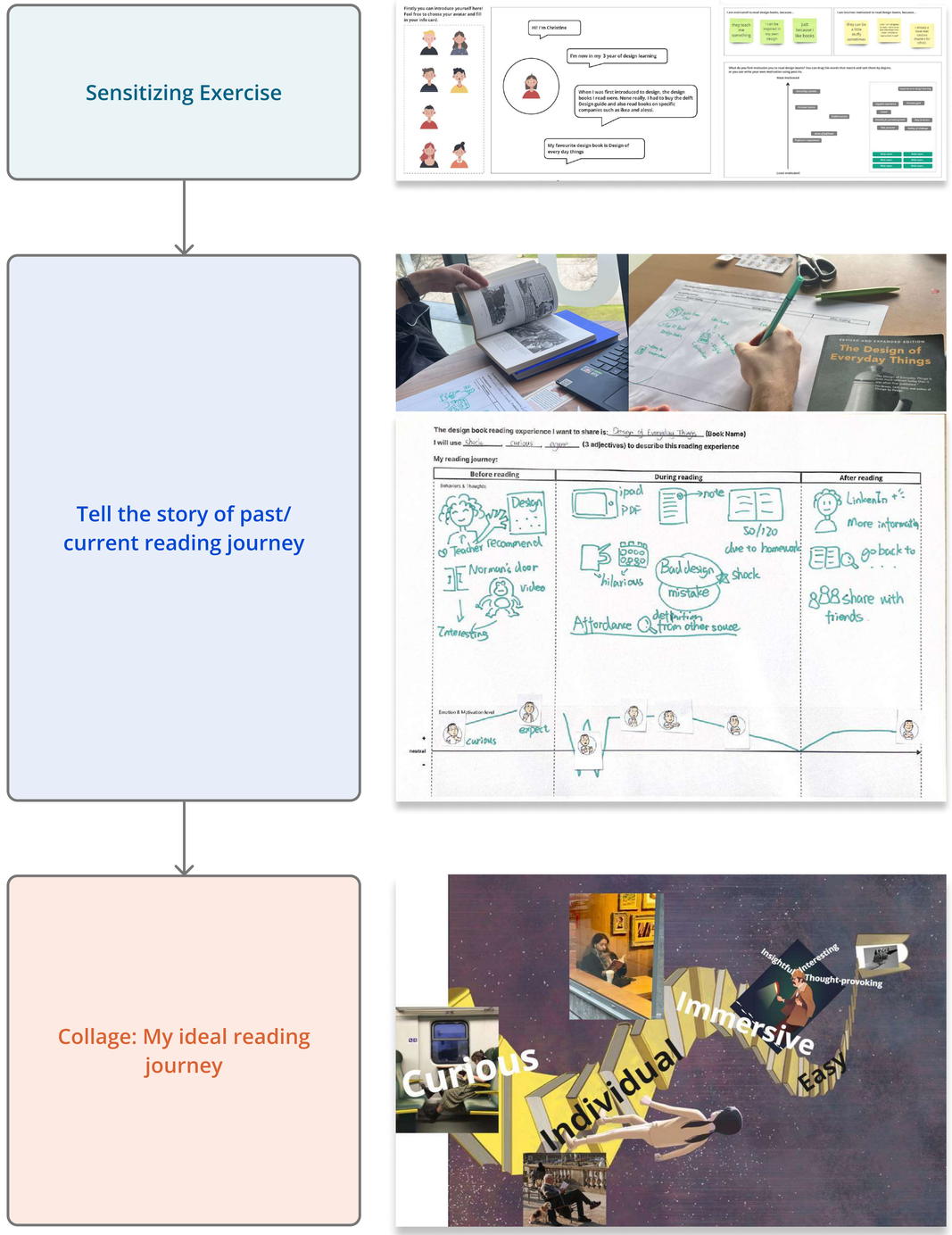


Figure 17. Procedure of Contextmapping study

Data Analysis

To analyse the raw data got from the context mapping sessions, all talks from the sessions were transcribed. As for the data about people's current and past reading experience, key quotes were first categorized into three main groups: reading behaviors, what motivates people, and what dismotivates people. Quotes within each category were then clustered together by identifying connections, forming different themes.

Current/Past reading experience				
Category	**Reading behaviors**	**What motivates readers**	**What dismotivates readers**	
Theme	Reading book reviews before choosing the book	Good reputation	Sense of uncertainty regarding utility value	*Before Reading*
		Recommendations from trustworthy people		
	Fliping through the book firstly	Sense of curiosity about the book		
		Nice visuals as a hook		
		Perceived attainment value (related to personal identity)		
	Linear reading is not necessary for design book reading	Perceived utility value	Lack of unpredictability and novelty	*During Reading*
	Sharing insights during reading			
	Taking notes/annotations	Perceived personal relevance	Much effort	
	Doing reflections during reading			
	Looking up unfamiliar terminology from other resources	Sense of ownership & possession	Complicated and unfamiliar terminology	
	Sharing insights after reading			*After Reading*
	Making a mindmap after reading			
	Searching for more info about the author after reading			

Figure 18. Overview of insight clusters for current and past reading experience

In the regard of the collage about ideal reading experience, key quotes were taken from participants' narratives. Besides, targeted feelings belonging to similar themes were clustered.

Ideal reading experience					
Phase	**Before Reading**	**During reading**			**After reading**
Ideal Feelings	Accessible & easy	Engaging	Relaxed	Insightful	Fulfilling
	Curious	Interesting	Comfortable	Thought provoking	Reflective
	Relevant	Fascinating	Calm	Informative	
		Immersive		Inspiring	

Figure 19. Overview of insight clusters for ideal reading experience

4.1.3 Results

To organize and present the obtained insights more intuitively and systematically, the results of the data analysis were depicted in a comprehensive reading journey map. The detailed analysis of this journey map will be provided in the following pages, with the complete version available in Appendix D.

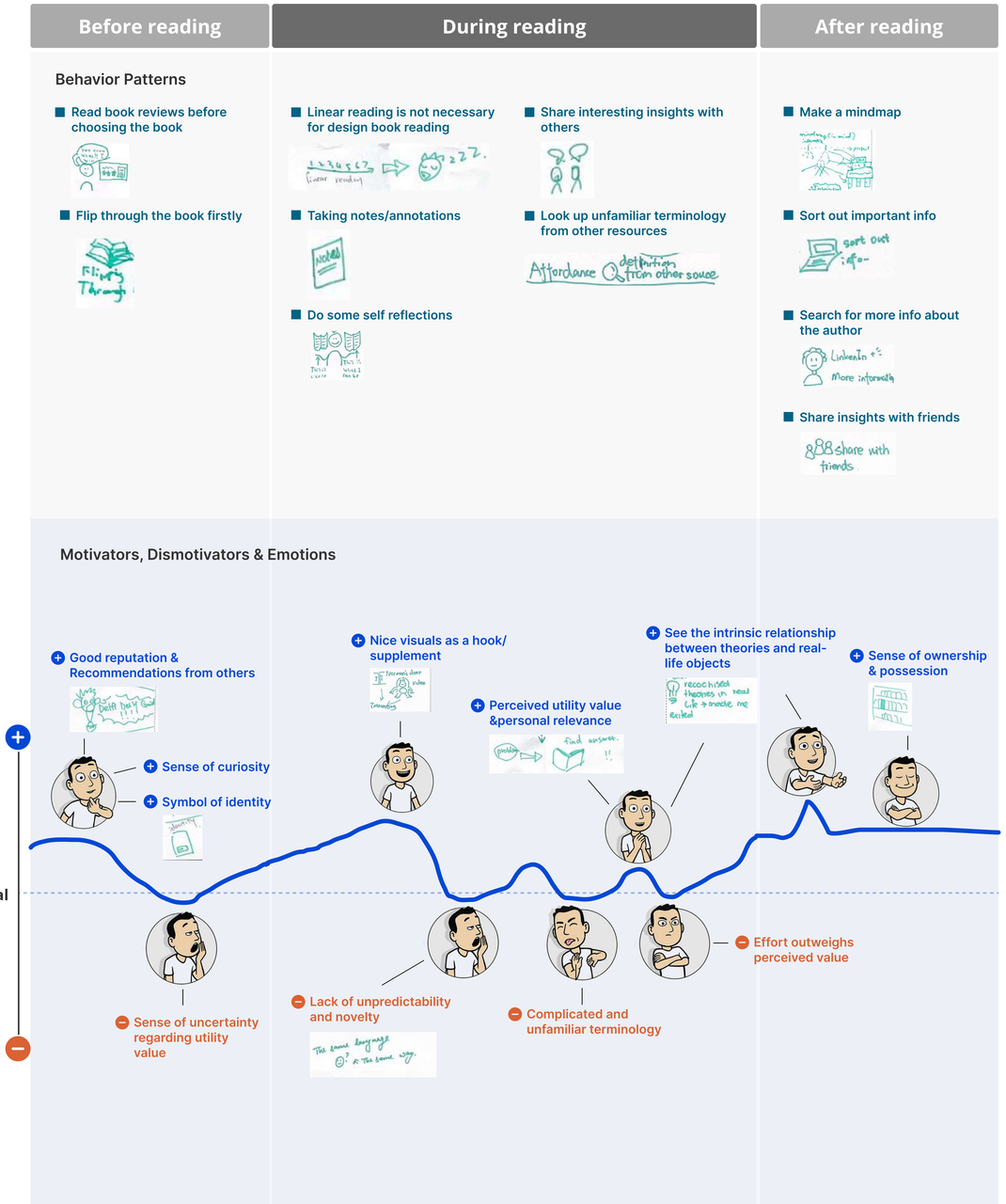


Figure 20. Reading journey map including behaviours, motivators, dismotivators and emotions

Reading behavior patterns

Since I aim to naturally integrate the design intervention into the reading experience, rather than creating a new interaction from scratch, the existing behavior patterns of the target group can serve as opportunities for integrating the design.

Before reading

Read book reviews & Flip through the book

Through research, one significant threshold causing people to hesitate before starting a book is the uncertainty about its content and value. They are unsure if the book is worth reading. To address this, if choosing books offline, such as in a library context, some participants opt to flip through the book to see if there is anything interesting. If choosing books online on sites like Goodreads, one participant mentioned that his decisions will be influenced by book reviews from others.

"Before reading the whole book, I used to flip through it to see if there was anything interesting"

——— *Participant 6*

"Sometimes I read book reviews before deciding which book to read, and bad reviews could turn me off."

——— *Participant 4*

During reading

Linear reading is not necessary for some design books

During the user research period, I also conducted an interview with PJ Stappers, seeking insights from his perspective as the author of the design book *Convivial Toolbox* and an expert in design education. In the interview, he mentioned that *Convivial Toolbox* functions more as a tool rather than fiction, and linear reading is not necessary. Different audiences can start the book from various sections. For example, design students may begin with theories to build a theoretical foundation, while practitioners might find the most value in the case study section.

This may depend on the structure of the design book. Some design books serve more as tools, where chapters are not sequentially connected, allowing readers to pick and choose sections that are useful or interesting to them without needing to read linearly. Some participants mentioned that they prefer to firstly browse the table of contents and directly jump into the parts that interest them rather than read from the beginning.

"When I read I'll firstly scan the table of contents to see if there's something interesting, then jump to the interesting stuff first."

——— *Participant 7*

Note-taking/Annotate

Note-taking and annotating were the most frequently mentioned actions. According to their descriptions, the ways of note-taking varied: some used a dedicated notebook, some used phone apps, some annotated directly in the book, and others used sticky notes for quick reference to specific sections.

Interestingly, most participants had engaged in these behaviors at some point, but it is not a consistent habit, likely due to a lack of triggers or suitable medium. One participant mentioned that he could perceive note-taking beneficial as it helps retain important information, which might otherwise be easily forgotten. However, he has not yet started doing this as he did not have a notebook at hand during reading, and it was inconvenient to annotate in library books. Another participant mentioned using a phone app to record his thoughts and reflections but couldn't keep up with it because 'the user experience of the app was terrible'.

"I want to make notes because the vital information will get lost easily otherwise."

——— *Participant 4*

"I used to take notes of my ideas on the phone. I didn't take notes from book itself, but I took notes of what I thought."

——— *Participant 6*

Share insights with others

Some participants mentioned their habit of sharing what they read. One participant, while reading Design of Everyday Things, found many real-life examples applicable and shared these with his family, as they were easy to understand and relatable. Another participant said she and her design student friends often share new insights from their reading in a group chat.

Do some reflections

One participant stated that during the reading process of the book *The Ten Faces of the Innovation*, he consciously engaged in reflection. He reflected on what he have done in the past, considering areas for improvement. Additionally, he considered how to apply the insights gained from the book to his future design career, aiming to improve himself as a designer.

Looking up unfamiliar terminology from other resources

Some participants read design books before starting their design studies or when they were new to design, which means that their knowledge of design concepts was relatively limited. Consequently, some participants often encountered unfamiliar terminology in the books. One participant mentioned that when she came across unfamiliar terms, she used search engines like Google as an additional supplement to look up their meanings.

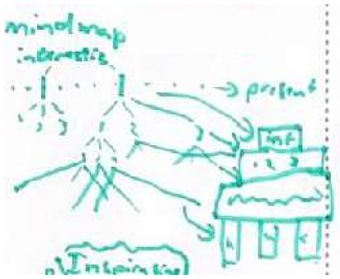
What motivates readers

Six main motivation boosters were identified from the context mapping research, with some overlap with the findings from the literature review.

After reading

Making a mindmap

Each time when finishing a book, one participant said that he would put all interesting things he remembered in mind together and made a mindmap. During his later studies, he would frequently refer to this mind map, drawing inspiration and making connections between different ideas to generate new design concepts.



Searching for more info about the author

In addition to using Google to look up the meanings of unfamiliar terminology, that participant was also very curious about the author. She mentioned that if she found the book interesting, she would search for more information about the author after finishing the book and even read other works by that author.

Before reading

Motivation Booster 1 - Good Reputation & Recommendations from trustworthy people

Many of the participants get to know a new design book through their professors' recommendations. They trust these suggestions and consider them reliable, with positive recommendations from professors increasing their motivation to start reading. Besides, the book's reputation also influences people's choice; one participant mentioned that if a book frequently appears in lists like 'Top 5 Books in Industrial Design,' it sparks curiosity and a desire to read. However, it is noteworthy that not everyone is swayed by external evaluations. Some participants stated that they trust their own judgment more than others' opinions and are willing to spend time selecting books by themselves.

"In my first year, my professor recommended me to read this book and said it's really nice."

——— *Participant 3*

Motivation Booster 2 - Sense of curiosity about the book

Through research, curiosity is found to be a major driving force behind reading, with 7 out of 8 participants selecting the same expression for curiosity (shown in Figure 21) to convey their emotions. Curiosity stems from various sources. As previously mentioned, the recommendation from professors and high ratings on online lists spark curiosity in some participants. In addition, some participants noted that podcasts, videos related to the book, or even just the illustrations within the book can ignite interest and foster a desire to read. Pieter Jan also mentioned in the interview that he used numerous visualizations in 'Convivial Toolbox' to hook readers' attention.

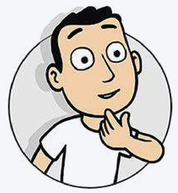
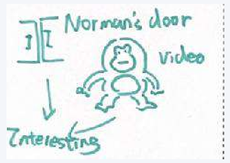


Figure 21. 7/8 participants choose this to represent their emotions before reading

"I saw a video about Norman's door and the gorilla. That was really funny and sparked my interest in the book."

——— *Participant 8*



Motivation Booster 3 - Perceived attainment value (related to identity)

Similar to insights from the literature, attainment value, which relates to personal identity, has a motivating effect on reading. Sometimes, people's bookshelfs can symbolize who they are as a person. One participant mentioned that his motivation to read the *Delft Design Guide* stemmed from his impending studies at TU Delft. He felt that owning and reading this book symbolized his identity as a Delft design student.

" Sometimes I think the books I read can symbolise who I am as a person. For example, one of the big reasons I read the Delft Design Guide was because I was coming to TUD soon at that time, and I felt like the book was kind of a symbol of TUD's identity"

——— *Participant 1*

During reading

Motivation Booster 4 - Perceived utility value

Perceived usefulness of the book is one of the most important motivators for readers to keep reading, likely due to the practical nature of design books. In the short term, students feel most motivated when they need to learn and apply theory to their own design projects immediately. Some participants mentioned that if they find a book's utility value limited after reading part of it, they will temporarily set it aside to focus on more urgent and important tasks.

In the long term, some participants believe design books could benefit their design careers and personal growth, serving as a long-term incentive for reading. Interestingly, the perception of utility value isn't always immediate. One participant noted that his peak moment occurred after finishing the book, when he discovered that the theories he had read were applicable and useful in his actual design practice, prompting him to revisit the book.

"Design books can help better ideation and I view them as stepping stones or ladders to a successful design concept"

——— *Participant 3*

Motivation Booster 5 - Perceived personal relevance

Another motivation booster is when novice designers can see the intrinsic relationship between theories and real-life objects, thereby perceiving the relevance of the content to their own lives. This is commonly seen in books that use everyday objects as design case studies, such as *Design of Everyday Things*. One participant mentioned, 'The first chapter in the book *Design of Everyday Things* talks a lot about stuff that was really applicable and recognizable in real life.' During reading, he started noticing things around him and was extra motivated to read those parts.

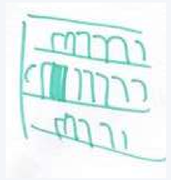
"When I realised that some examples or things I also could encounter in my daily life, I was extra motivated to read those parts"

——— *Participant 2*

Motivation Booster 6 - Sense of ownership & possession

The final motivation booster concluded from the research is the sense of ownership and possession. Some participants mentioned that they prefer physical books because books could become part of their collection on the bookshelf, giving them a sense of satisfaction and happiness. In contrast, digital versions, such as PDFs, often get forgotten in a random folder after being read.

"I tend to forget books in laptop, kindle or e-reader, but if I have books on my shelf I know I have them. I also enjoy looking at all books I have in my room and some books have really beautiful covers."



——— *Participant 5*

Barriers to motivation

Aside from motivation boosters, barriers to motivation were also studied, and four main barries were identified.

Before reading

Motivation Barrier 1 - Uncertainty (sense of uncertainty regarding utility value)

As stated earlier, perceiving the utility value of a book can make students more motivated to read. Likely, uncertainty about the utility value could become a threashold for them to start reading. One participant stated that the thicker the book, the more his uncertainty and anxiety increase, as he doesn't want to waste his time on a book that might not bring him much value.

Motivation Barrier 2 - Boredom (lack of unpredictability and novelty)

This barrier is more related to the contents, the structure and the writing style of the book. For example, one of the participants stated that she was bored by the fixed structure of each chapter of the book she read, where theory was always followed by case studies and examples.

During reading

Motivation Barrier 3 - Much Effort (effort outweighs perceived value)

This barrier is related to the issue of 'complicated and unfamiliar terminology.' Participants noted that dealing with a large amount of specialized and complex information during the reading process requires significant effort. However, when the value of the reading isn't immediately clear—particularly when the knowledge gained can't be directly applied to their current design projects—they feel that the effort outweighs the perceived value. As a result, they often choose to focus on more urgent or important tasks instead.

"The book is not necessary for my uni work, so I just put it aside for other more urgent and important things. "

Participant 1

Motivation Barrier 4 - Frustration (complicated and unfamiliar terminology)

Given that many novice designers are just beginning to engage with design, their background knowledge of the field is relatively limited, and many of the technical terms in design books are unfamiliar to them. These difficult terms and language can can add friction to reading. To address this, some authors include a glossary in their books to help readers understand.

"Sometimes I don't understand the language because the language they use is really really complex and professional. I have to read again and again to understand it and the reading becomes more like a task."

Participant 3

Features of ideal reading experience

Based on participants' narratives and collages, ideal reading experiences were clustered into different themes. These features provide concepts for the experiences the target audience seeks and can serve as evaluation criteria for future design.

Engaging and challenging like a game

The desired features for this theme are interesting, engaging, fascinating and challenging. Some participants hope the reading experience can be like a detective game, offering a certain level of challenge while also providing supportive clues that give them a sense of control.

Figure 22. Picture chosen in the collage

An insightful and thought-provoking journey

The key words for this theme are informative, insightful, thought-provoking and inspring. Compared to fun and excitement, these participants place more emphasis on the functional value of design books. Their ideal reading experience is one that brings them a lot of reflection, insights, and useful knowledge.

Figure 23. Picture chosen in the collage

A journey of relaxed and calm self-reflection

The desired features for this theme are relaxed, calm, comfortable and reflective. They hope for reading to become an immersive experience of self-meditation and self-dialogue.

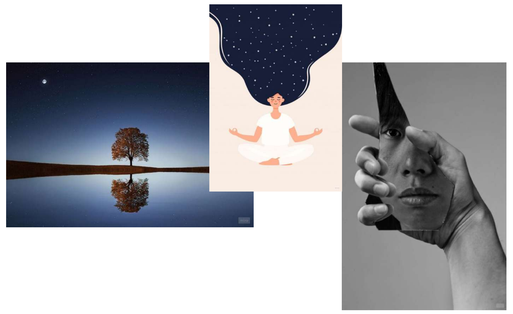


Figure 24. Pictures chosen in the collage

4.2 Summary of Key Takeaways

4 key opportunities to naturally integrate design

People's common behaviors and actions can be seen as good opportunities for design intervention. After evaluation, the four most promising opportunities are **exploring book reviews before reading**, **taking notes and making annotations during reading**, **reflecting during reading**, and **sharing acquired knowledge and insights with others**. These behavioral patterns will form the basis for the optimal moments to intervene design.

6 key motivation boosters for starting and sustaining reading

Based on the research findings, few participants would consider purely external regulations, such as deadlines and professors' requirements, as factors that motivate them to keep reading, although these regulations can sometimes compel them to take action.

More participants find their motivation to continue reading from the value of the book's content, such as its **interesting nature**, its **usefulness for design studies**, or its **contribution to personal identity**. Starting to read often requires a **curiosity-inducing hook**, which could come from recommendations by others or an engaging video or podcast related to the book. Additionally, the **satisfaction** derived from reading different books and collecting them on a bookshelf can also enhance motivation to complete reading.

All these motivation boosters collected in this chapter provide essential **ingredients for forming the design opportunities** and developing a gamification framework using the Octalysis System.

4 barriers to reading motivation

Four key barriers to motivation were identified, including **the uncertainty regarding utility value, the lack of unpredictability and novelty in book content, complicated terminology, and and the feeling that the effort required outweighs the perceived value.** While the subsequent design won't address all these issues, these insights into barriers to reading motivation offer a more comprehensive perspective for the design process moving forward.

Ideal reading experience

Based on participants' narratives and collages, the ideal reading experience clusters into the following themes:

Engaging and Challenging Like a Game:

- Desired Qualities: Interesting, engaging, fascinating, and challenging.
- Participants hope the reading experience can be like a detective game, offering a certain level of challenge while also providing supportive clues that give them a sense of control.

An Insightful and Thought-Provoking Journey:

- Desired Qualities: Informative, insightful, thought-provoking, and inspiring.
- Participants emphasize the functional value of the design book, seeking experiences that bring reflection, insights, and useful knowledge.

A Journey of Relaxed and Calm Self-Reflection:

- Desired Qualities: Relaxed, calm, comfortable, and reflective.
- Participants hope for an immersive reading experience of self-meditation and self-dialogue.

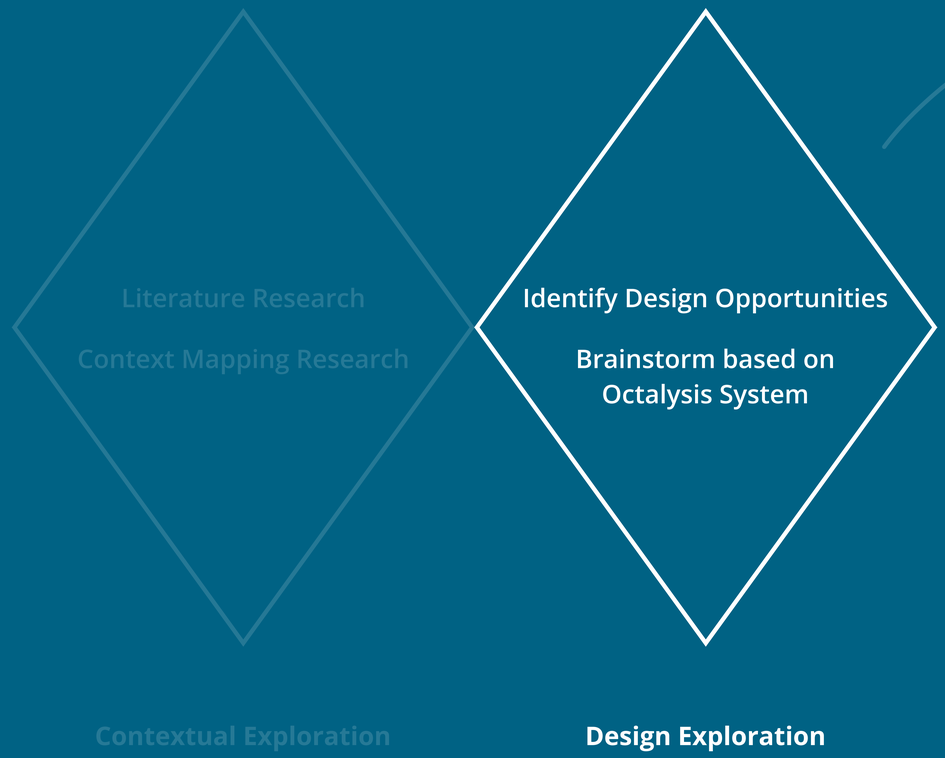
Although all these qualities are valuable, they do not align with the same theme and cannot all be achieved simultaneously. In the 'learning by doing' phase, further exploration will be conducted to determine which qualities the final design should prioritize.

Chapter 5
Design Directions

This chapter serves as a bridge between research and design. It synthesizes motivation boosters identified from both contextual and theoretical research, using them to form four key design opportunities.

The ideation process began with a top-down approach, generating small ideas guided by the design opportunities and the Octalysis System. Then, a bottom-up approach was used to refine and cluster these ideas into three main design directions. These directions set the stage for the 'Learning by Doing' phase in Chapter 6.

Chapter Overview



5.1 Transform Research Takeaways into Design Opportunities

Motivation boosters identified from previous context mapping and literature research serve as the foundation for developing design opportunities. To encourage diverse ideation later on, none of these boosters were pre-selected or prioritized over others. Instead, they were classified and clustered according to the corresponding motivation barriers, forming the basis for design opportunities. These four primary design opportunities guided the ideation process and are explained in detail on the following page.

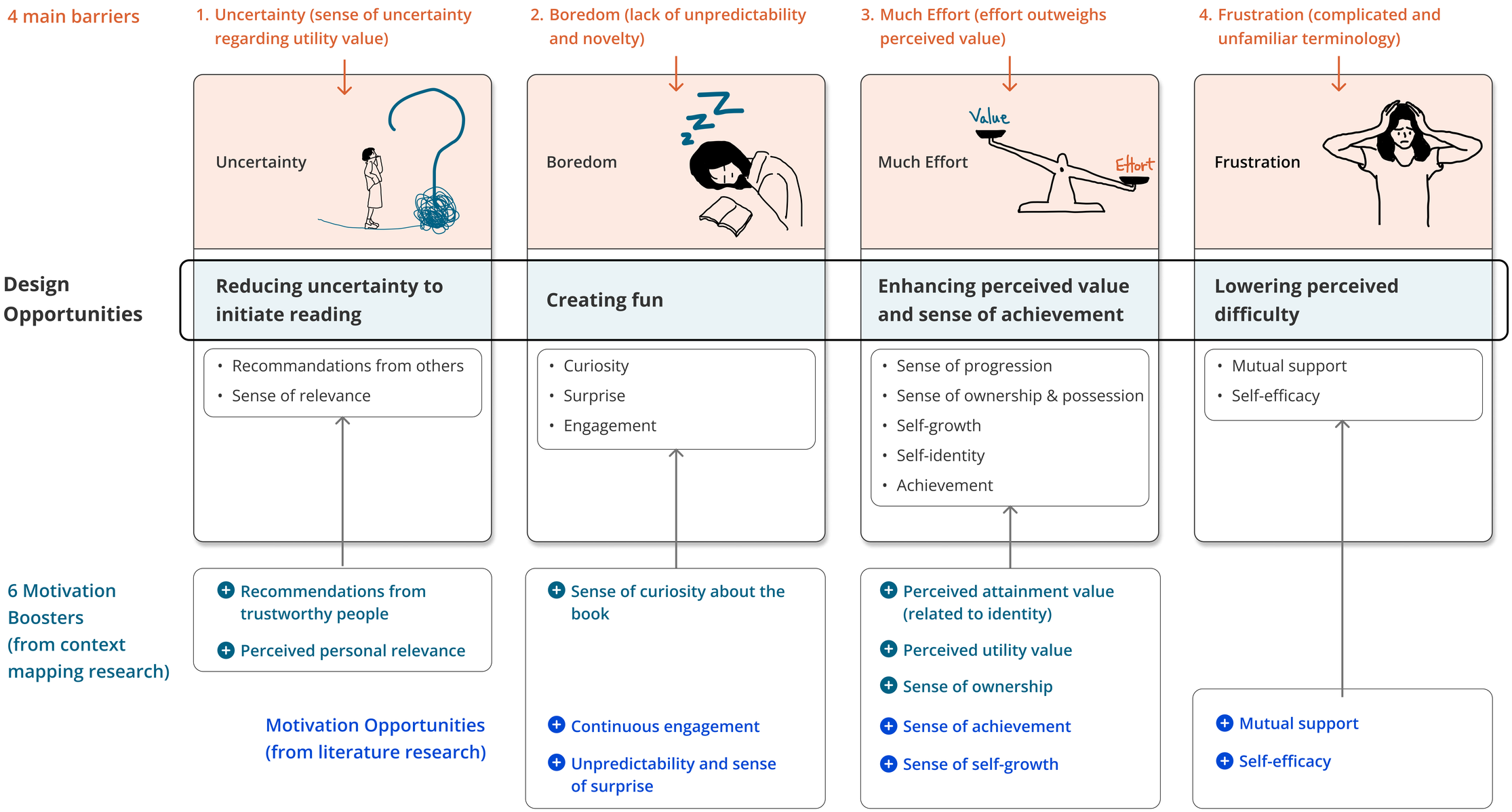


Figure 25. Transform motivation boosters and barriers into design opportunities

5.2 Design Opportunities

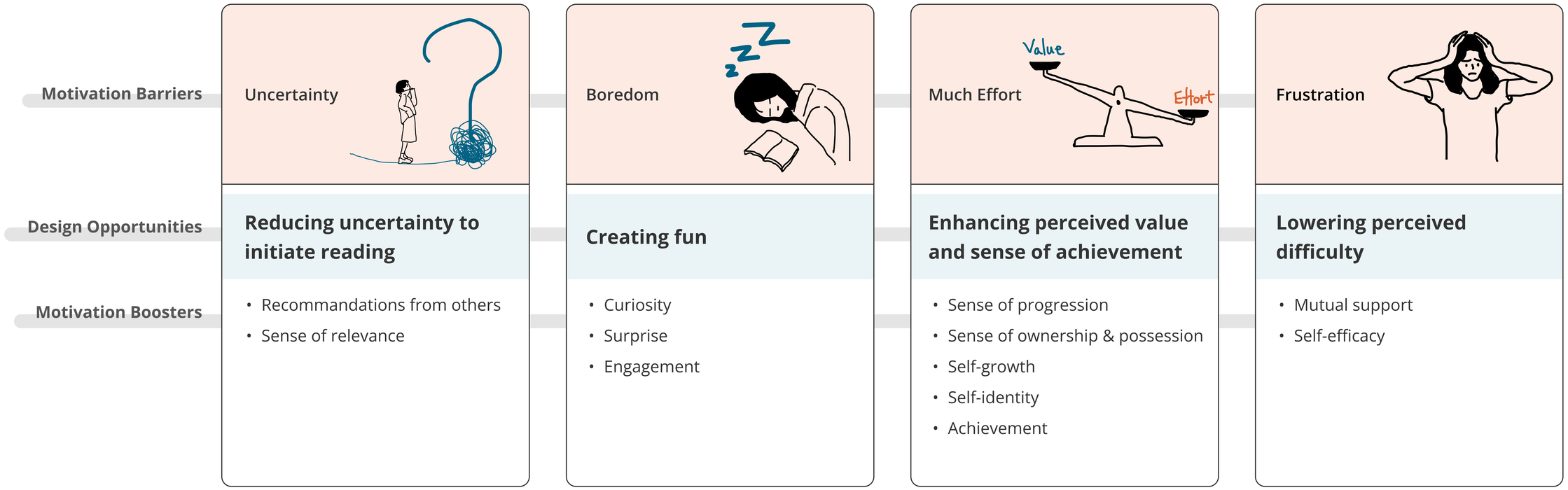


Figure 26. Four design opportunities

Reducing Uncertainty to Initiate Reading

To lower the threshold for reading by reducing uncertainty, there are two related motivation boosters: recommendations from others and a sense of relevance. User research revealed that novice designers, lacking relevant knowledge, often feel uncertain when selecting design books. Many of novice designers rely more on recommendations from professors or fellow design students. Creating a community where designers can share valuable design books with each other could be a potential opportunity. A sense of relevance is also crucial. Many students are motivated to read when they perceive a connection to their current projects, their identity, or their personal life.

Creating fun

Creating fun can boost intrinsic motivation. Based on research, intrinsic motivation could be strengthened through sparking curiosity, providing a sense of surprise, and increasing engagement.

Curiosity is particularly effective in the pre-reading phase, driving the initiation of reading a book. Meanwhile, incorporating elements of surprise and engagement can sustain and increase the motivation to continue reading.

Enhancing perceived value and sense of achievement

To enhance perceived value, there are two main types: utility value, and attainment value which is related to self-identity. If users perceive that reading promotes their personal growth or helps refine their self-identity, they will be more motivated to continue reading.

Furthermore, fostering a sense of collecting can provide a tangible measure of progress and motivate continued reading. Visual progress indicators and milestones can enhance the sense of progression and achievement, making readers feel they are advancing towards a goal.

Lowering perceived difficulty

Perceived difficulty is a significant factor that hinders users from continuing to read and diminishes their motivation. In reducing perceived difficulty, there are two design possibilities: providing mutual support and enhancing self-efficacy. For novice designers, complex content can pose comprehension challenges. If other readers can offer different perspectives and insights, it may assist them in understanding and digesting the material more effectively. Additionally, rather than reading the full book directly, adjusting the reading structure may help them start from easier content and enhance their sense of competence.

5.3 Brainstorm Using Both Octalysis System and Design Opportunities

A self-brainstorm session was conducted starting from design opportunities stated before and also the Octalysis System to generate small design ideas in different directions. In this phase, I avoided prematurely defining the final form of the design output to maintain the openness of thought. My intention was to diverge as much as possible initially and then gradually converge the direction through rapid prototype iterations during the 'learning by doing' phase.

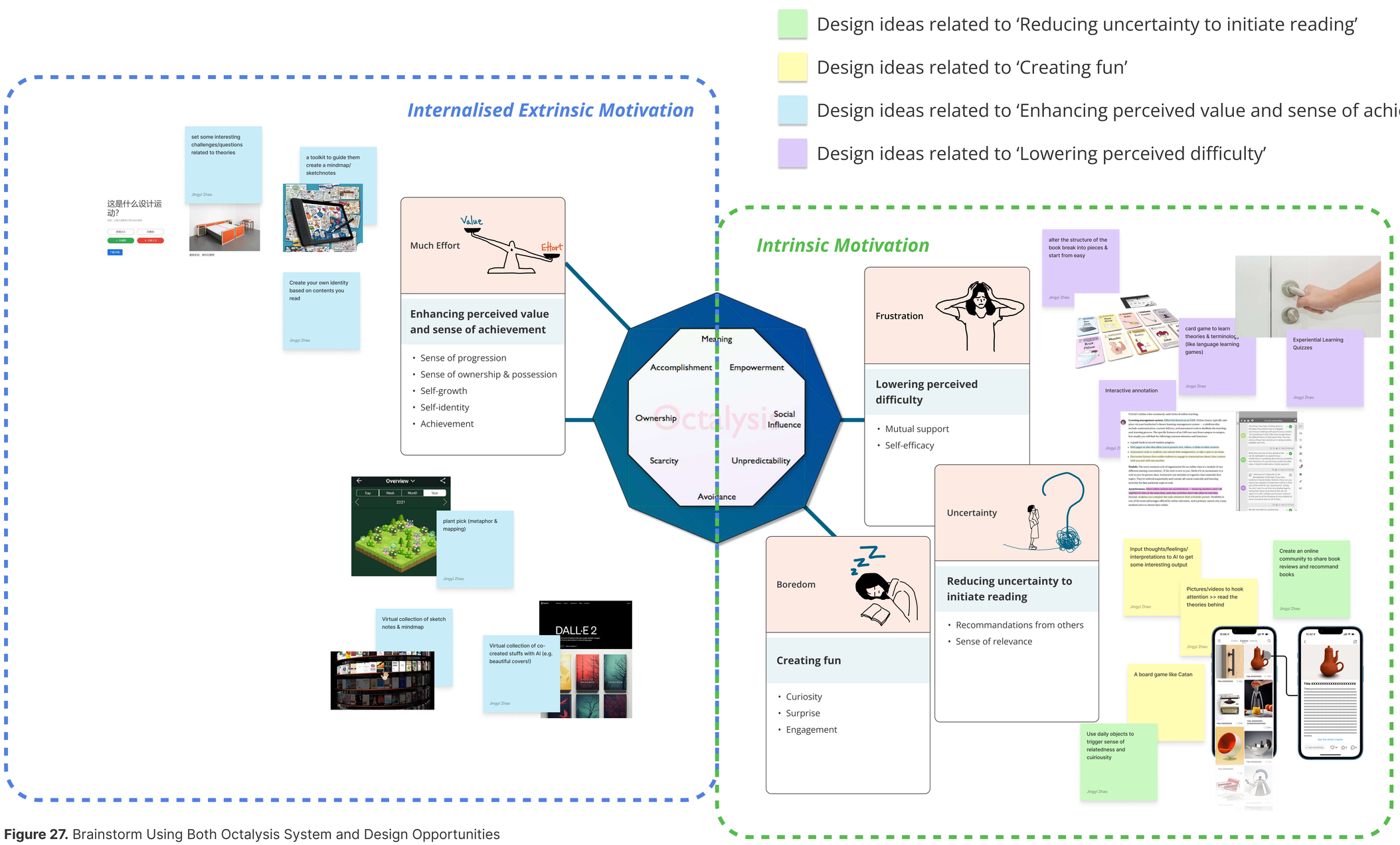


Figure 27. Brainstorm Using Both Octalysis System and Design Opportunities

5.4 Idea Clustering into 3 Design Directions

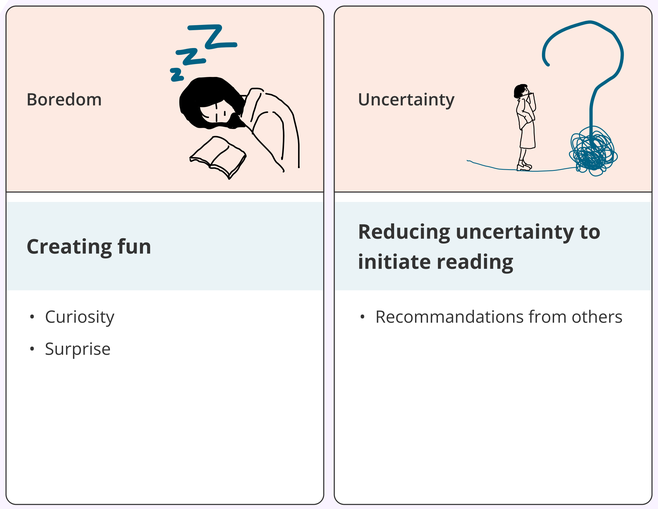
The design directions were developed using a bottom-up approach. Since the ideas generated from brainstorming were more akin to small features, I filtered and clustered them, eliminating those that were difficult to develop further. This process resulted in three distinct design directions:

1. **Triggering curiosity and interest through book fragments during the exploration phase**
2. **Providing mutual support through interactive annotation during and after reading**
3. **Enhancing the sense of progression by collecting pieces of reflections during reading**.

While Directions 1 and 2 both address issues related to boredom, they employ different motivation boosters. Direction 1 creates fun by triggering curiosity and surprise, while Direction 2 enhances the engagement of the reading journey.

In the Octalysis System, Direction 1 aligns with 'Unpredictability,' Direction 2 targets 'Social Influence,' and Direction 3 relates primarily to 'Ownership' and 'Accomplishment.'

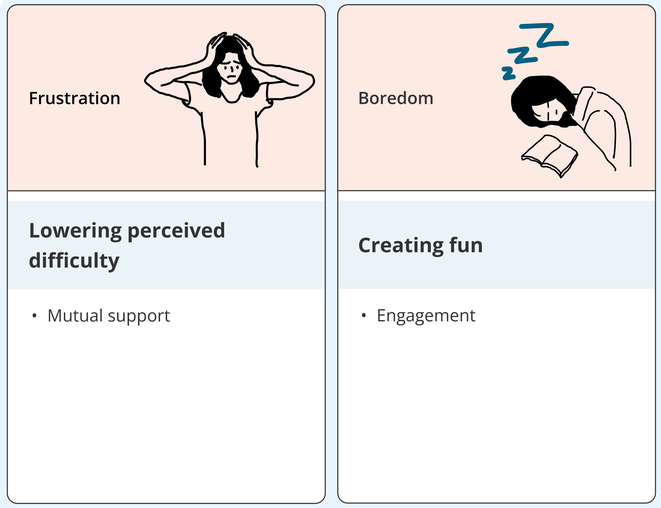
In the upcoming 'learning by doing' phase, I will focus on each design direction, creating and testing prototypes on a weekly basis.



Direction 1: Triggering curiosity and interest through book fragments

Keywords: *exploring through book fragments, images as hooks, curiousity, interest*

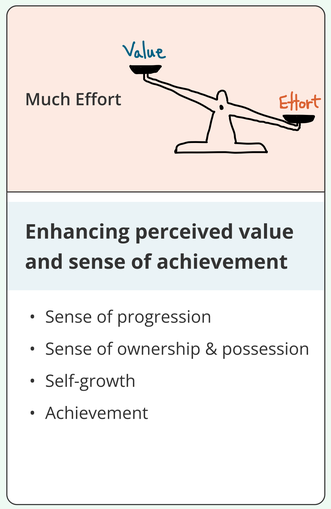
This idea aims to encourage the exploration of design books and initiate reading. It hooks attention through a collection of intriguing images paired with titles of design theories from the books. Users can choose images that interest them and read related short excerpts from the book. If they wish to delve deeper, they can click 'see the whole chapter,' leading them to the full book and enabling seamless continued reading.



Direction 2: Providing mutural support through interactive annotation

Keywords: *interactive annotations, AI generating images, engaging, thought-provoking*

This idea relies on a collaborative interactive annotation. In the digital reading process, readers can annotate the content using the tools I provide. These annotations can include thoughts, feelings, interpretations, questions, and personal experiences. Additionally, they can use generative AI, take photos, or draw to add visualizations to their annotations. Throughout this process, readers can also view annotations provided by others.



Direction 3: Enhancing sense of progression through collecting pieces of reflections

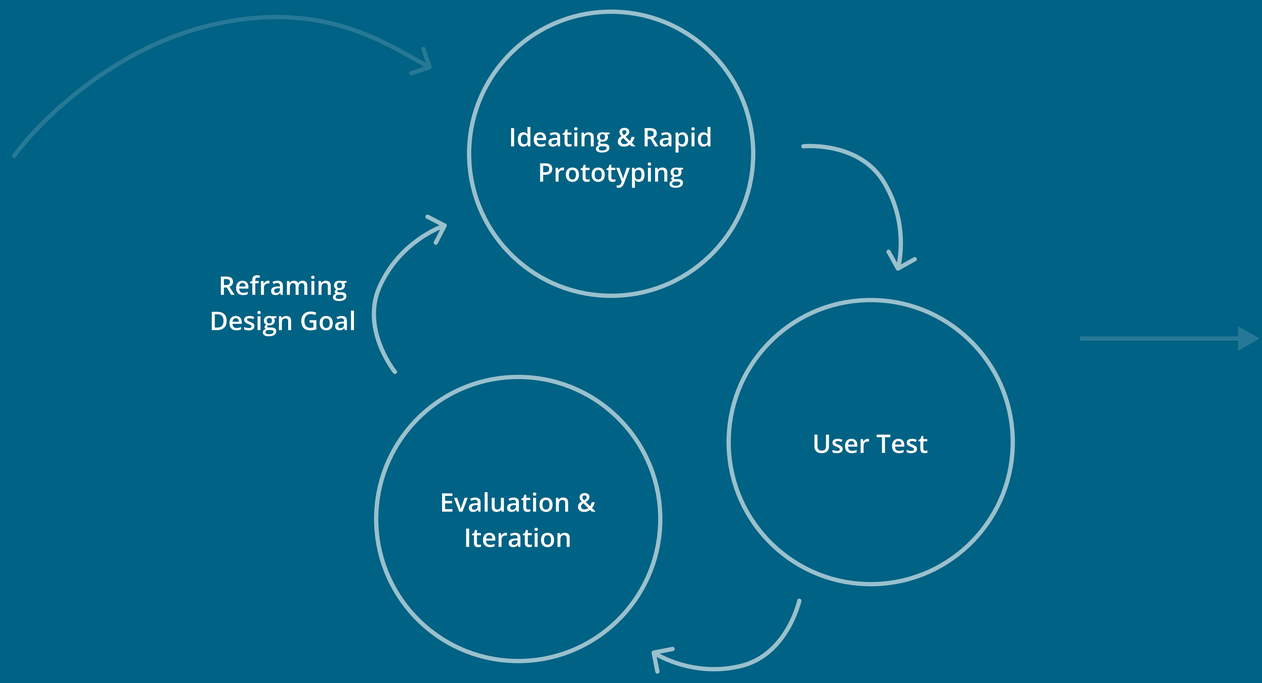
Keywords: *collecting book cover pieces, reflections, sense of progression*

This idea is more related to individual reading. The book cover is divided into pieces and scattered across various chapters. During reading, readers encounter these pieces and can use the reverse side to write down their reflections on the content. As reading continues, these pieces are gradually collected, and the book cover on the virtual bookshelf becomes progressively complete.

Figure 28. 3 Design Directions

Chapter 6
Learning by Doing—Cycle 1 Iteration

In the 'Learning by Doing' phase, two major design iteration cycles were conducted. This chapter focuses on Design Iteration Cycle 1, where the primary focus was on exploring three distinct gamified reading directions through quick prototyping and testing. The goal was to determine the most promising design direction and define the specific qualities of the design goal. This exploration laid the foundation for Design Iteration Cycle 2.



Learning by Doing

Chapter Overview

6.1 Overview of the Design Iteration Process

During the 'learning by doing' phase, two major iteration cycles were conducted before arriving at the final concept. In the first cycle, four concepts across three design directions were prototyped and evaluated. The goal of this cycle was to identify which design direction held the most potential for further development as the final concept and to refine the design goal after selecting the final direction.

In the second cycle, after choosing the final design direction, feasibility and practical implementation were carefully considered. Two potential ways to fit design into the real world emerged: collaborating with a design museum's bookshop and integrating the design into the Immer App. Based on these potential ways and the insights from the first cycle, three new concepts were developed and evaluated through prototype testing. The diagram below illustrates these two iteration cycles.

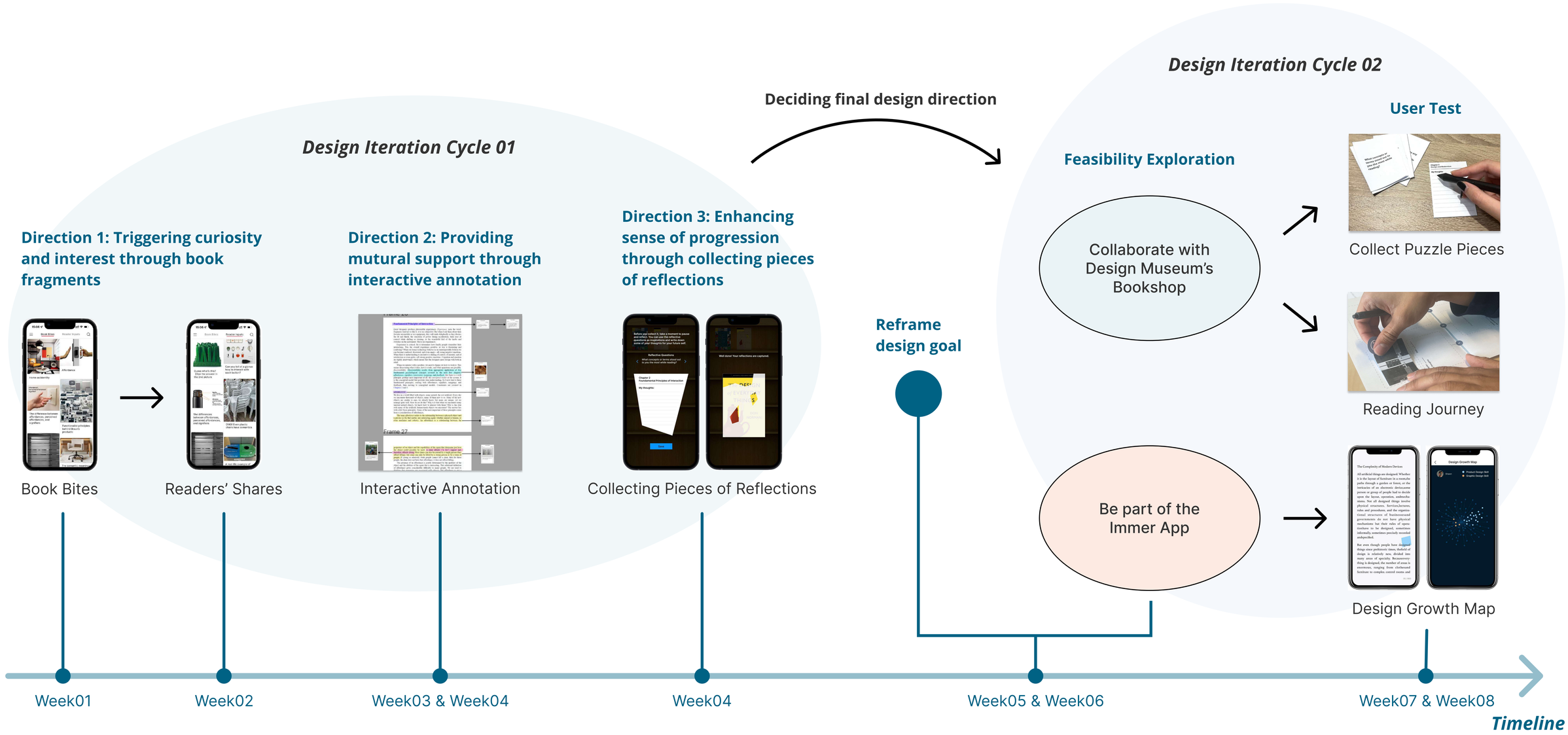


Figure 29. Overview of the Design Iteration Process

6.2 Design Iteration Cycle 1: Rapid Exploration of Three Gamified Reading Directions

6.2.1 The goal of Cycle 1

The three design directions introduced in the previous chapter, 'Design Directions,' each target different reading stages and aim to evoke distinct outcomes and experiences. Since my design goal was still vague at the beginning of Cycle 1, it was crucial to **explore these concepts as a way to identify the most promising design direction and further define the qualities that the final design should achieve**.

Thus, the focus of Cycle 1 was not on validating whether each concept fully met its targeted qualities, but rather on deciding the final design direction and the design goal. To accomplish this, I prioritized gathering insights from open-ended questions to better understand users' subjective experiences with each design direction. The Likert scale was used only as a supplementary tool to gauge whether the desired qualities were being met, with detailed results available in the Appendix E.

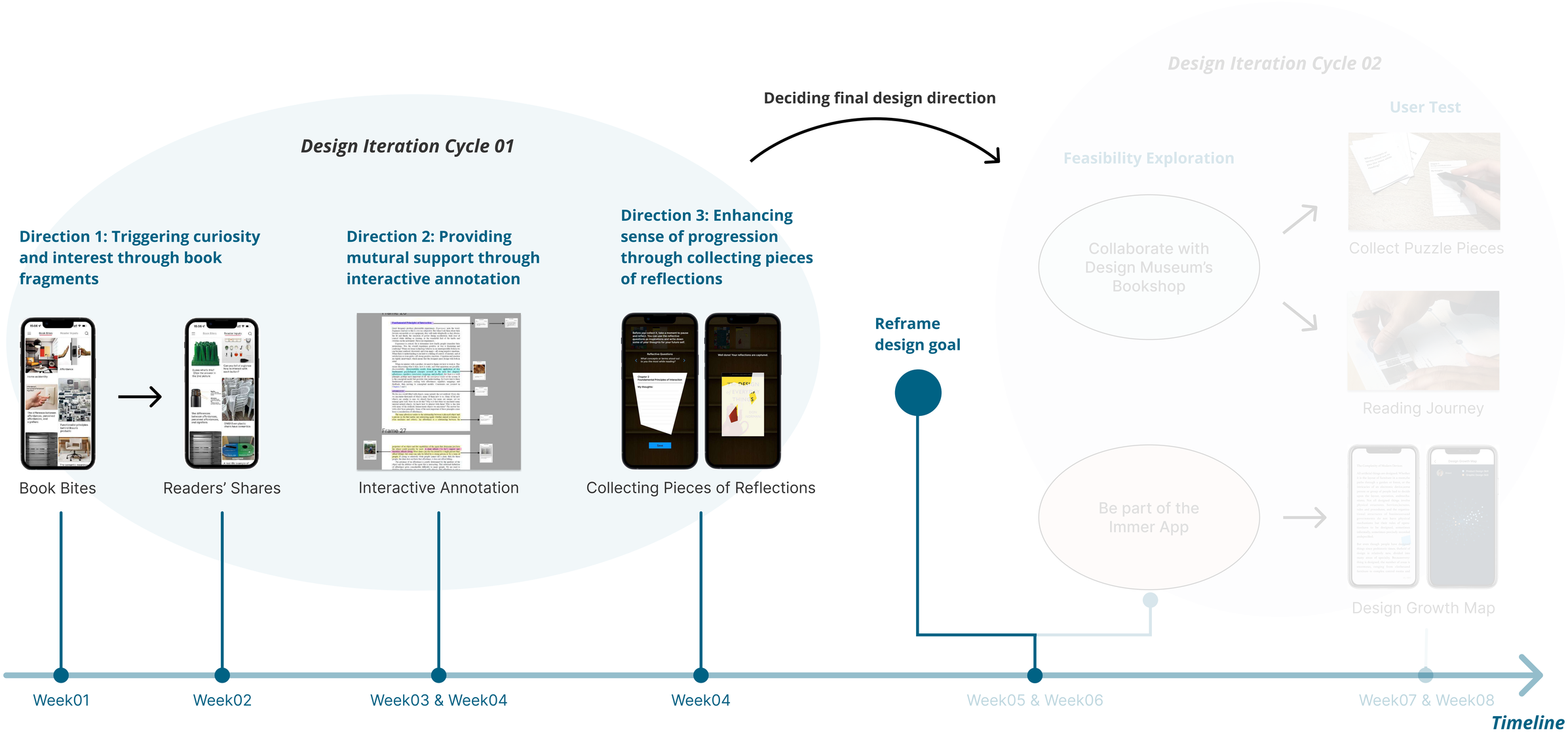


Figure 30. Design Iteration Cycle 1

6.2.2 Concept Description & Test Set-up

Concept 1: Book Bites

Concept description

This concept targets novice designers who do not have a specific book in mind and wish to explore potential interests. The goal is to **spark curiosity and the desire to read the full book by presenting content excerpts alongside related images from the book**. The inspiration came from user research, which revealed that linear reading is not always necessary for some design books and that readers are often drawn to illustrations, which capture their attention and generate interest.

It's noteworthy that readers might use this not only as a tool for exploring books but also to gain some design knowledge through fragmented reading. However, for habitual readers, this fast-food style of reading could potentially impact their reading habits and concentration over time, similar to the effects of short video social media. On the other hand, for those who do not read books at all, this approach could at least provide some knowledge, marking a small yet significant improvement.

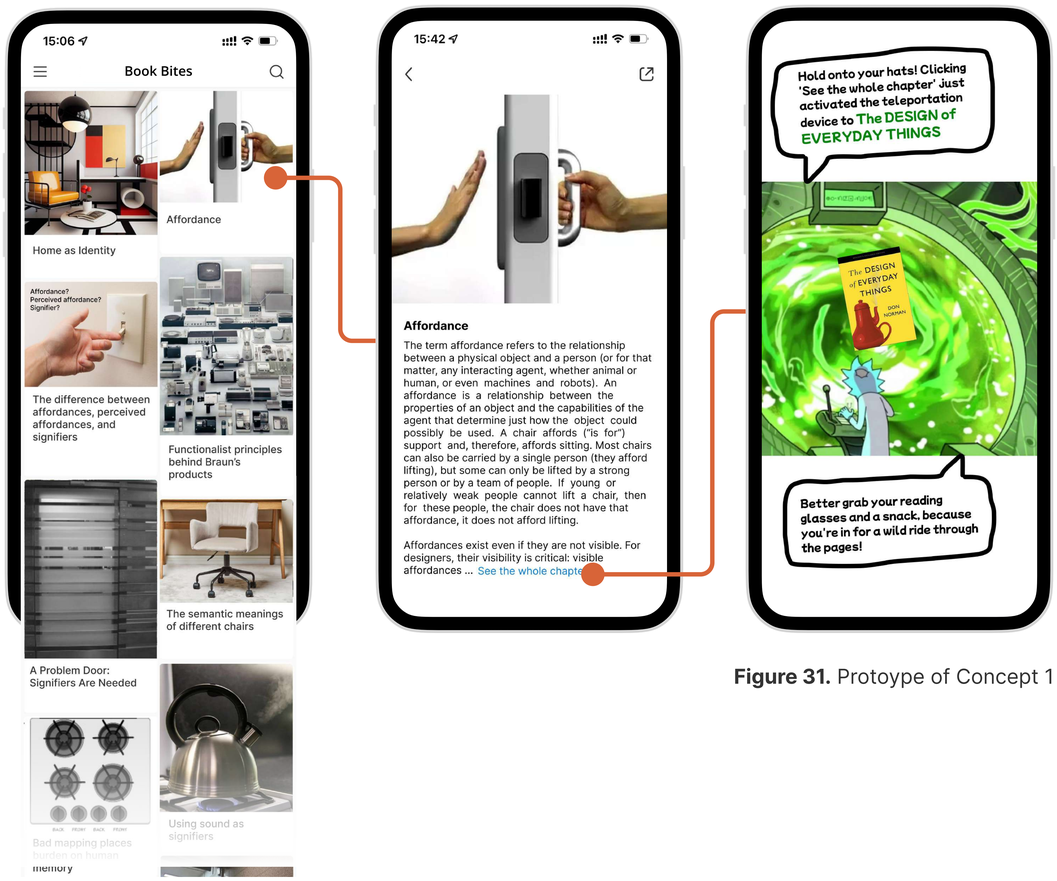


Figure 31. Protoype of Concept 1

Test set-up

- ***Participants***: Four participants were selected, including two bachelor students and two master students. Among them, there was one graduate student with little interest in design books, and the others had read a few design books but were not particularly enthusiastic.

- ***Prototype***: This concept was prototyped through Figma. In this prototype, all images are clickable and linked to corresponding theory snippets. This allows me to observe their choices without any interference and ask them about the reasons behind selecting specific images and theories.

- ***Task:*** Browse 'Book bites' section freely for 5 mins and think out loud.

- ***Evaluation approach:*** Both test and evaluation sessions were conducted individually. After each test, participants were interviewed with open-ended questions to gather their subjective feelings and opinions. Following the interview, participants completed a Likert-scale questionnaire to collect data related to the desired features of this concept. The interview questions and Likert-scale questionnaire can be seen in Appendix E.

Figure 32. The participant was trying the prototype

Concept 2: Readers' shares

Concept description

The concept consists of two parts:

1. **Exploring potentially interesting books from the perspective of a browser**
2. **Contributing a book sharing to the community from the perspective of a sharer**

The community relies on the active participation of both browsers and sharers to function effectively. The following sections will introduce this concept from both perspectives.

From the perspective of a browser:

Like concept 1, this concept targets novice designers interested in exploring design books. The main difference is that the discovery interface features images and titles generated by other readers, with each tile representing a shared book. To capture attention and spark curiosity, some shares are presented as Q&A, others with catchy titles, and some use relatable everyday images. When users click on an image, they can view the sharer's insights alongside the relevant text from the book.

Figure 33. Protoype of Concept 2 (for browsers)

From the perspective of a sharer:

I included the sharer role in this concept because creating shares encourages readers to reflect on and digest what they've read, potentially deepening their understanding. For those eager to share, using this community to discuss books could make the reading process more engaging and motivating, as they aim to teach others and enhance their own learning.

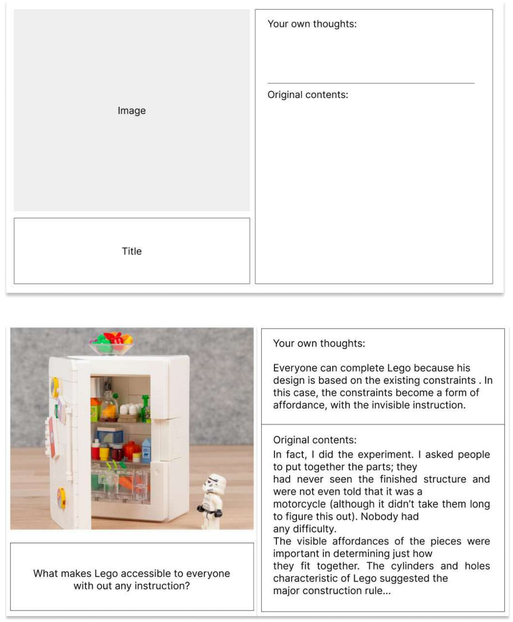


Figure 34. Protoype of Concept 2 (for sharers)

Test set-up

- ***Participants***: The same four participants from Concept 1 prototype test
- ***Procedure:*** The test session was conducted in a group format. Participants first played the role of browsers, using the prototypes in Figma on their phones, followed by an evaluation session. Next, they switched to the role of sharers, utilizing the provided guidance and tools to create shares based on the books they brought with them. Another evaluation session followed this activity.
- ***Prototype:*** For browsers, the 'Readers' Shares' community was prototyped in Figma for participants to try on their phones. For sharers, guidance and templates of the sharing were provided on a collaborative Figma page, allowing them to reread their books and create shares.
- ***Evaluation approach:*** Both evaluation sessions involved group discussions using question sheets and post-its. After each discussion, participants completed a Likert-scale questionnaire to assess the desired features. Details of the questions and questionnaires for both browsers and sharers are in Appendix E.

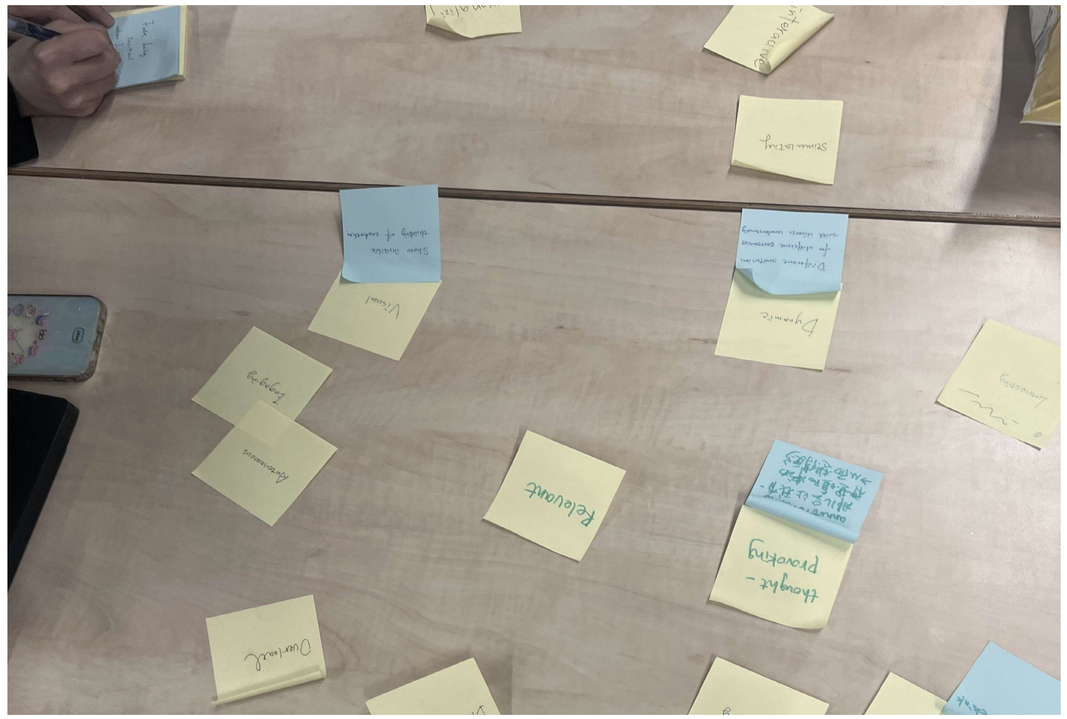


Figure 35. Group evaluation session

Concept 3: Interactive Annotation

Concept description

Unlike the first two concepts, which focus more on the pre-reading phase, this concept centers on the “during reading” phase. The aim is to explore whether interactive annotations and peer support can make the reading experience more engaging and thought-provoking. When users encounter passages or terms that trigger thoughts or questions, they can use the provided annotation tool, following the guidance to add annotations. Annotations can include both images and text. For images, users can generate images using the prototyped AI tool, and they can also use photos from their albums or take new photos. Additionally, during the reading process, they can see and interact with other readers' highlights and annotations as well.

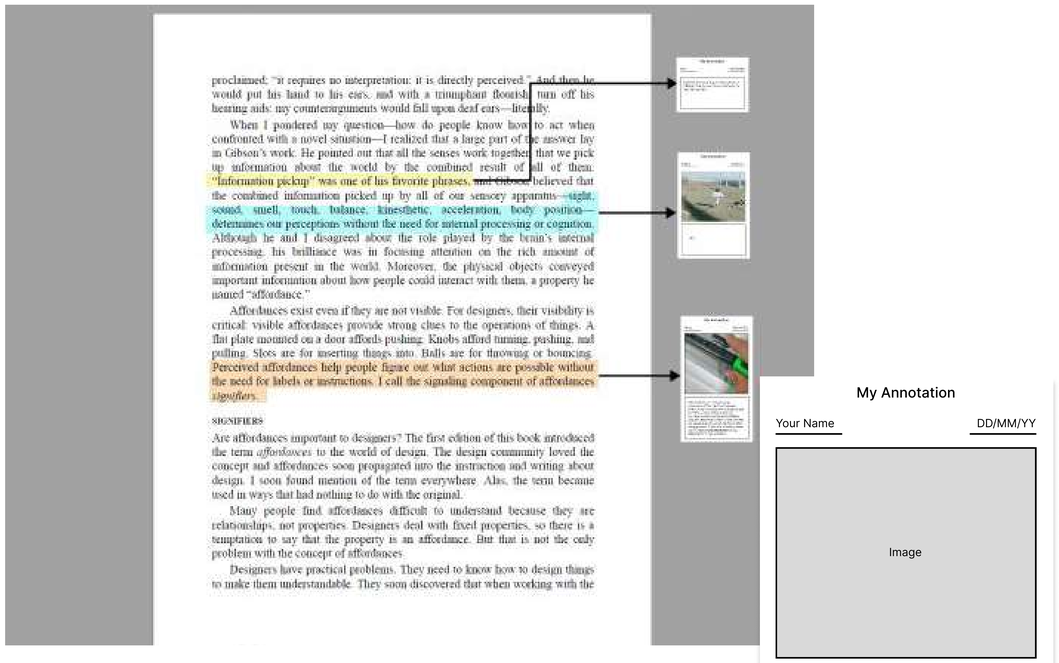


Figure 36. Designed collaborative annoation tool on a shared Figma file

Test set-up

- ***Participants***: Another four participants were recruited for this test, including two bachelor students and two master students. All of them had read some design books before but were not super interested in reading.
- ***Prototype***: The prototype consists of four parts, the guidance, the annotation template, the chapters to read, and the AI image generation tool. The first three were prototyped in a shared Figma file, while the AI tool was prototyped using the AILixir Demo tool.
- ***Task:*** Unlike the previous timed group task, this test gave participants more freedom. With a week to read the chapters in a comfortable environment, they could choose if and when to use the Figma-designed annotation tool and guidance.
- ***Evaluation approach:*** The evaluation took place a week later in a group setting. It began with a group discussion using question sheets and post-its, followed by a Likert-scale questionnaire to assess the desired features. Details are in Appendix E.

Figure 37. Group evaluation session

Concept 4: Collecting Pieces of Reflections

Concept description

This concept is more related to individual reading. The aim is to explore how collecting book cover fragments and writing down reflections impact the reading experience and motivation. While reading, users encounter QR codes scattered throughout the chapters. Through canning these codes, users can get a new fragment of the book cover.

On the back of each fragment, users can write down reflections of the content they just read based on reflective questions. The reflective questions were designed based on five-phases of reflection: identification, association, integration, analysis and transformation (Too, 2013). As more fragments are collected, the book cover becomes increasingly complete.

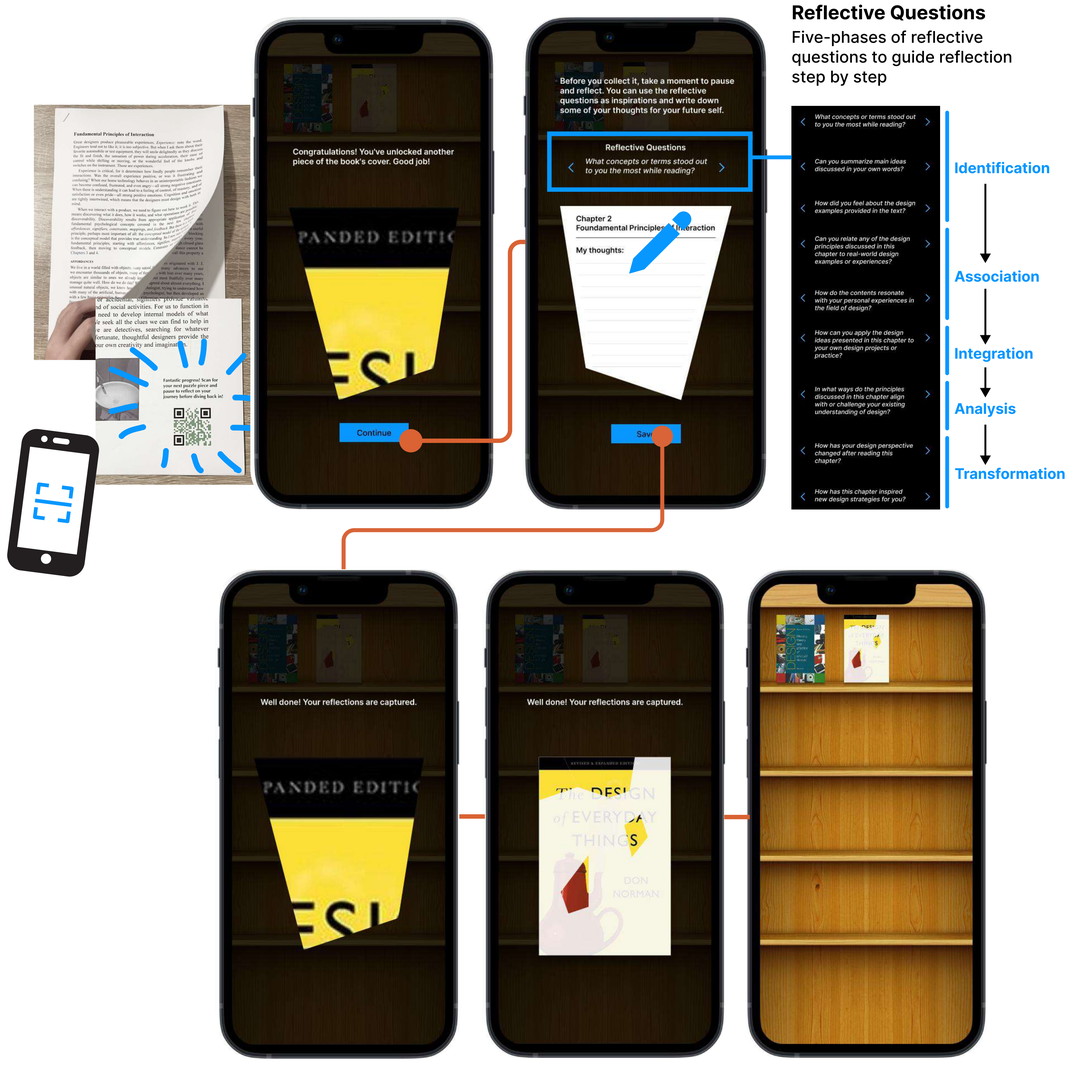


Figure 38. Prototype for Concept 4

Test set-up

- ***Participants***: The same four participants from Concept 3 prototype test

- ***Prototype***: The prototype consists of two parts, the physical reading materials and a digital collecting process. QR codes were integrated into the reading materials to connect the digital collection process. The experience involving collecting fragments of the book cover and jotting down reflections was prototyped using Figma.

- ***Task:*** The test was conducted individually. During the test session, the participants need to read the provided chapters from "The design of everyday things" with the prototype.

- ***Evaluation approach:*** Both test and evaluation sessions were conducted individually. After each test, participants were interviewed with open-ended questions to gather their opinions and subjective feelings, followed by a Likert-scale questionnaire to assess the desired features. Details are in Appendix E.

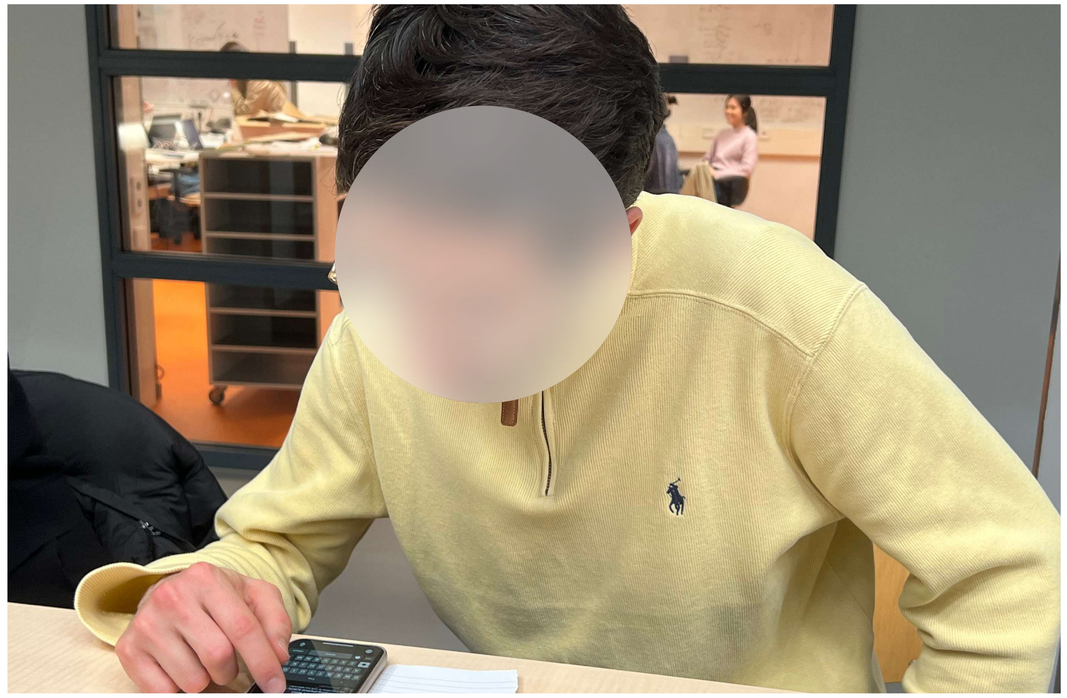


Figure 39. The participant was trying the prototype

6.2.3 Test Results

Concept 1: Book Bites

Key feelings

Novel

Some participants found the approach of exploring books innovative.

> *"This form of exploring new books is kind of novel to me."*
>
> — *Participant 3*

Difficult

Some participants mentioned difficulty in understanding the fragmented content due to the lack of context and basic information about the books.

> *"Without context and basic information of the book, it's a bit difficult for me to understand this fragmented content."*
>
> — *Participant 2*

Inefficient

Participants seeking a specific book found this approach time-consuming and inefficient because the concept doesn't categorize books by genre.

> *"If my goal is just to explore more books, this format is fun. However, if I want to efficiently narrow down the books I might be interested in, this format is time-consuming and inefficient because it doesn't categorize books by genre."*
>
> — *Participant 4*

Less intriguring

Some participants felt that the images and professional terminology used in the discovery interface made it appear more serious and less intriguring. Particularly for undergraduate participants, unfamiliar professional terms in titles did not pique their curiosity or interest in clicking to see the content excerpts.

> *"The chosen images and professional terminology in the titles here shows a professional vibe. It's not really intriguring for me. "*
>
> — *Participant 1*

Concept 2: Readers' shares

Key feelings (as the role of browsers)

Curious

Most of participants were interested in the sharer's insights and curious about the book mentioned. They have the urge to interact with the sharer.

> *"Exaggerated titles are more likely to make me feel curious about it."*
>
> — *Participant 1*

Thought Provoking

Some participants found the Q&A form more thought-provoking than other forms of titles.

> *"These titles in the form of questions trigger me to think about it. And I really want to know if my answers are right.'*
>
> — *Participant 4*

Confused

One participant was confused by the purpose of this concept, as it aims to help users discover new books but doesn't provide sufficient information about the book title, author, or main contents.

> *'Since this platform is for me to explore and discover new design books, why the book titles and authors are missing? I don't know they are from which book, this makes me feel quite confused.'*
>
> — *Participant 2*

Ineffective

Most of participants were more drawn to the sharer's insights and the opportunity to engage with them, rather than being motivated to read the book itself. In other words, this concept didn't effectively motivate them to check the book itself.

> *"This Q&A format is interesting, but I might only want to know the answer to the question and will not read about the design principles behind it. It didn't make me more motivated to check the book."*
>
> — *Participant 4*

Concept 2: Readers' shares

Key feelings (as the role of sharers)

Reflective

Some participants felt that reading with the intention of sharing made the experience more reflective.

'When I read with the intention of sharing something useful with others, it forces me to think more and reflect more.'

Participant 2

Hesitant

Some participants felt hesitant and less confident when creating their shares because they doubted the value of their contributions to others.

'I'm not sure if the content I share is accurate or useful to others.'

Participant 1

Exhausting & Tiring

Many participants felt that creating engaging images and titles was too mentally taxing.

"Reading is already a tiring job for me, and having to think about how to share it makes it even more exhausting."

Participant 1

Redundant & Meaningless

Most participants felt the effort of sharing outweighed the personal value gained. Their motivation stemmed mainly from a desire for communication and recognition within a community of shared interests, rather than the altruistic goal of encouraging non-readers to read.

"I feel that this form of sharing is redundant and meaningless for myself. I'm just recreating something more appealing to others based on the original book."

Participant 3

Concept 3: Interactive Annotation

Key feelings

Thought Provoking

Both the tool itself and others' annotations serve as a stimulation for more thoughts.

"Having this tool over there serves as a stimulation for me to think more."

Participant 3

Engaging

Some participants felt that generating visuals using AI makes the process more engaging.

"AI generating images helps me transform abstract ideas into tangible forms. I felt reading becomes more engaging."

Participant 2

Autonomous

Some participants felt a greater sense of autonomy by being able to add their personal touch to the book.

'Even when passively receiving the author's viewpoints, I still want to actively express some of my own thoughts. This annotation tool helps me add personal touch to the book.

Participant 2

Distractive

The interactive annotation system boosted reflection and engagement for some but disrupted the reading flow. This was partly due to the low-fidelity prototype, which displayed all annotations and highlights continuously, without letting users control when to view them.

"Other people's annotations disrupt my original reading flow and my own thoughts."

Participant 1

Overloaded

Keeping reading others' annotations make some participants feel overwhelmed and overloaded.

"I always find myself wanting to look at other people's annotations, and their annotations keep me thinking. That makes me feel a bit overwhelmed."

Participant 4

Concept 4: Collecting Pieces of Reflections

Key feelings (as the role of sharers)

Lower perceived difficulty

Some participants perceive these book cover fragments as small milestones, which break the entire book into more manageable parts, making reading easier.

> *"These puzzle pieces are like small milestones, breaking down the whole book into more manageable parts. For me, it makes reading easier, and I enjoy having a pause in between each section."*
>
> ———— *Participant 3*

Reflective

Participants viewed the book cover fragment as a chance for them to reflect more.

> *"These reflective questions start simple and gradually become more complex. They can effectively guide me to think step by step."*
>
> ———— *Participant 1*

Motivating

Jotting down reflections enhances some participants' perception of the book's usefulness, thereby increasing their desire to read further.

> *"The more I write, the more I perceive the usefulness of this book, and I became more motivated to continue reading."*
>
> ———— *Participant 1*

Fun

The interaction of scanning the QR code adds some fun to the serious book.

> *'I felt a bit surprised when I saw the QR code, and it added a touch of fun to this serious book.'*
>
> ———— *Participant 4*

Interrupted

Some participants felt that scanning a code with their phone disrupted the reading flow and was a distraction.

> *'I just entered the flow of reading, and the appearance of this QR code interrupted my flow.'*
>
> ———— *Participant 2*

6.3 Key Takeaways & Design Choices

6.3.1 Converged Design Direction

As I mentioned at the beginning, the primary goal of Cycle 1 was to identify the most promising design direction and further refine the features that the final design should aim to achieve. Based on the Cycle 1 testing, I was able to determine the direction for my final concept. **The chosen design direction focuses on enhancing motivation by increasing engagement and the perceived value of reading.** Additionally, the final design is primarily targeted at the 'during reading' and 'after reading' phases. The reasons for this choice are explained in detail below.

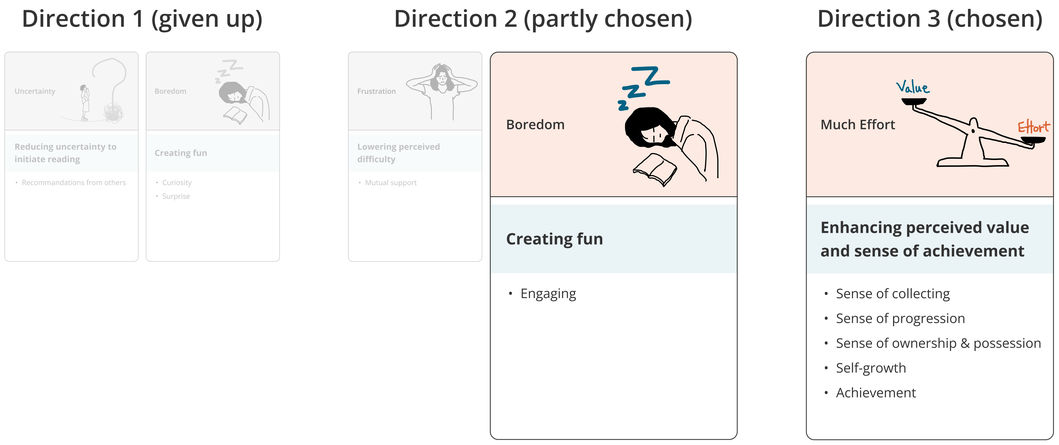


Figure 40. Chosen design direction

Direction 1: Triggering curiosity and interest before reading is given up

The results reveal that Concept 1 (Book Bites) and Concept 2 (Readers' Shares) were ineffective in encouraging users to start reading or lowering the reading threshold during the "before reading" stage.

For Book Bites, the combination of images and prominent titles is a novel approach, but the serious tone and content taken directly from books failed to spark curiosity or interest. It could even have long-term negative effects, such as fostering a preference for fragmented information, which might harm reading habits, concentration, and memory.

While Readers' Shares is more intriguring, it doesn't effectively promote interest in the books themselves or motivate users to start reading. Additionally, from the sharers' perspective, the effort required outweighs the perceived value, leading to a reluctance to share, which makes the concept unviable.

For these reasons, this design direction was abandoned. However, it's important to note that abandoning this direction doesn't mean sparking curiosity to initiate reading is unfeasible, but rather that these two concepts lacked the potential for further development.

Direction 2: Providing mutural support through interactive annotation is partly chosen

The key insight from testing Concept 3 (Interactive Annotation) is that making reading more engaging and thought-provoking can significantly enhance the value derived from reading and boost motivation to continue. This sense of engagement and intellectual stimulation primarily comes from users generating their own annotations, rather than from reading others' annotations.

While annotations from other novice designers can occasionally provide diverse perspectives, their overall value and support are questionable. Many novice designers found insights from design experts or authors more useful and beneficial than those from peers. Additionally, these external annotations risk causing information overload and disrupting the reading flow.

Therefore, the features of 'engagging' and 'thought-provoking' will be the desired features of the final design, while the concept of collective reading will be discarded due to its potential drawbacks. The chosen direction will instead prioritize individual reading experiences.

Direction 3: Enhancing sense of progression through collecting pieces of reflections is chosen

The testing of concept 4 (Collecting Pieces of Reflections) indicated that facilitating knowledge accumulation and self-growth, and making this growth visible to readers motivates continued reading.

However, contrary to the assumptions, incomplete book cover has very limited effect on motivation to read. Most participants noted that their motivation mainly stemed from their perception of the book's value and the sense of personal growth. For some participants, these book cover fragments served merely as a medium, and collecting them did not lead to a strong sense of progress. The reason for this may be that the book cover has little relevance to the readers themselves. In contrast, jotting down reflections gave them a sense of digesting information and accumulating knowledge, providing a sense of achievement that motivates them to continue reading.

To further develop this direction, there are two opportunities for improvements: one is to allow users to review and organize their reflections and thoughts after reading, and the other is to change the 'collecting book cover fragments' to something more engaging and more relevant to readers themselves. The detailed explanation were presented in the following section: Opportunities for Final Design.

6.3.2 Opportunities for Final Design

Although Direction 3 has the most potential to be further developped, there is still a large room for improvement. In the second Design Iteration Cycle, the following aspects should be taken into account:

Non-intrusive gamification features

The Concept 3 test indicates that readers don't want to be distracted or interrupted too much while reading. As I mentioned in *3.2.3 Applying the Octalysis System to My Project*, gamification elements could indeed become distractions that detract from the reading experience. To minimize disruption, it's crucial to ensure that elements such as the reflective questions or challenges are closely tied to the content, appearing at natural pauses in the reading, such as at chapter breaks, to avoid breaking the flow.

Additionally, the focus should be on enhancing intrinsic motivation, encouraging deeper comprehension rather than simply rewarding speed or task completion. Offering users the autonomy to opt out of interventions can also prevent distraction for those who prefer to concentrate solely on reading. By designing game elements that reward depth of understanding and critical thinking, and by balancing engagement with the need for focus, the benefits of gamification can be harnessed without compromising the integrity of the reading experience.

Revisiting and organizing ideas

In Concept 4, the value of recording reflections and ideas extends beyond just the act of collecting and recording them. Reviewing and organizing these thoughts after completing the reading, as well as applying them in future learning, is also highly meaningful for readers. Participants expressed a desire for a feature that would allow them to revisit and organize their ideas for future reference.

Enhancing attainment value & relatedness

Participants found the idea of collecting book cover fragments in Concept 4 to be neither attractive nor motivating, as they felt these fragments lacked personal relevance. Readers preferred outcomes that were more closely tied to their own identities and experiences. This feedback reminded me of a key insight from previous user research: attainment value, which is closely linked to personal identity, can significantly boost motivation. With this in mind, for the final design, I am considering mapping the collected notes into a skill tree or growth map, which could better motivate people to read by making the experience more personally meaningful.

Figure 41. An example of the skill tree

6.4 Reframing the Design Goal

Through Cycle 1 exploration, the design direction was determined, identifying four key features that most effectively motivate novice designers to read: engagement, thought-provocation, knowledge building, and self-growth. These features were refined and established as the primary goals of the final design.

"My design goal is to design an intervention that **elevates the motivation** and **perceived value** of design book reading for novice designers. This intervention aims to make the experience more **engaging** and **thought-provoking**, fostering a sense of **knowledge building** and **self-growth**."

Engaging

Research indicates that active participation in the reading process can greatly enhance a reader's connection to the material, making the experience both more meaningful and enjoyable (Guthrie & Wigfield, 2000). Consequently, the design should facilitate this transition from passive reception of the author's viewpoints to active engagement, allowing readers to convey their own opinions. At the same time, it is crucial that the design does not overly distract from the reading itself, maintaining a balance between interaction and immersion.

Thought-provoking

Regarding thought-provocation, prompting readers to draw connections and critically reflect on the content is shown to deepen comprehension and retention of information (Schraw, 1998). However, it is essential that this is done in a balanced manner, as excessive cognitive load can overwhelm readers and hinder their ability to process the material effectively.

Knowledge Building

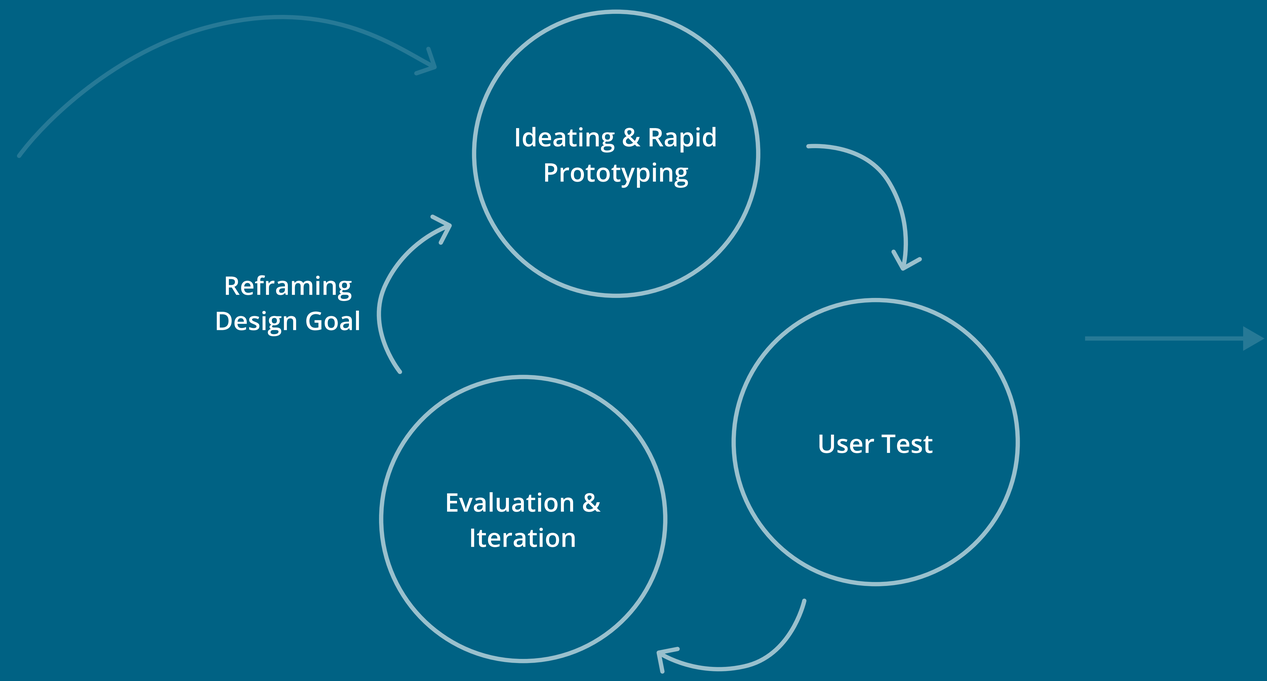
According to interest theory (Schiefele, 1991), the perception of knowledge building and an increased sense of value are key factors in fostering individual interest, which in turn provides a more stable motivation for ongoing reading. To support this, the design should encourage readers not only to absorb information but also to integrate it with their existing knowledge, apply it to real-life scenarios, and thereby create a richer, more meaningful knowledge base.

Self-growth

Bandura's (1997) research on self-efficacy indicates that individuals are more likely to remain motivated when they perceive tangible signs of their own progress and development. This sense of achievement is vital for maintaining long-term engagement with a task. Consequently, the design should aim to reinforce readers' awareness of their progression and growth in their design careers while also ensuring they recognize the attainment value of their reading.

Chapter 7
Learning by Doing—Cycle 2 Iteration

This chapter deals with Design Iteration Cycle 2, where the primary goal was to delve into and determine the main features of the final concept. The concepts in Cycle 2 were developed based on feasibility consideration and evaluated through prototyping and testing. The outcomes of this cycle determined the core features of the final design and laid the groundwork for the Final Design Iteration.



Learning by Doing

Chapter Overview

7.1 Design Iteration Cycle 2: Deciding Main Features of the Final Concept

7.1.1 The goal of Cycle 2

After Cycle 1, both the design goal and the final design direction were established. **The primary objective of Cycle 2 was to delve into and determine the main features of the final concept**. To achieve that, firstly feasibility and practical implementation were taken into account. This approach aims to ensure that the final design not only aligns with the established design goal but also is practical and viable for implementation.

Based on feasibility consideration, three concepts were developed and tested. The following pages will explain them in detail in terms of concept description, test set-up, test results and key takeaways.

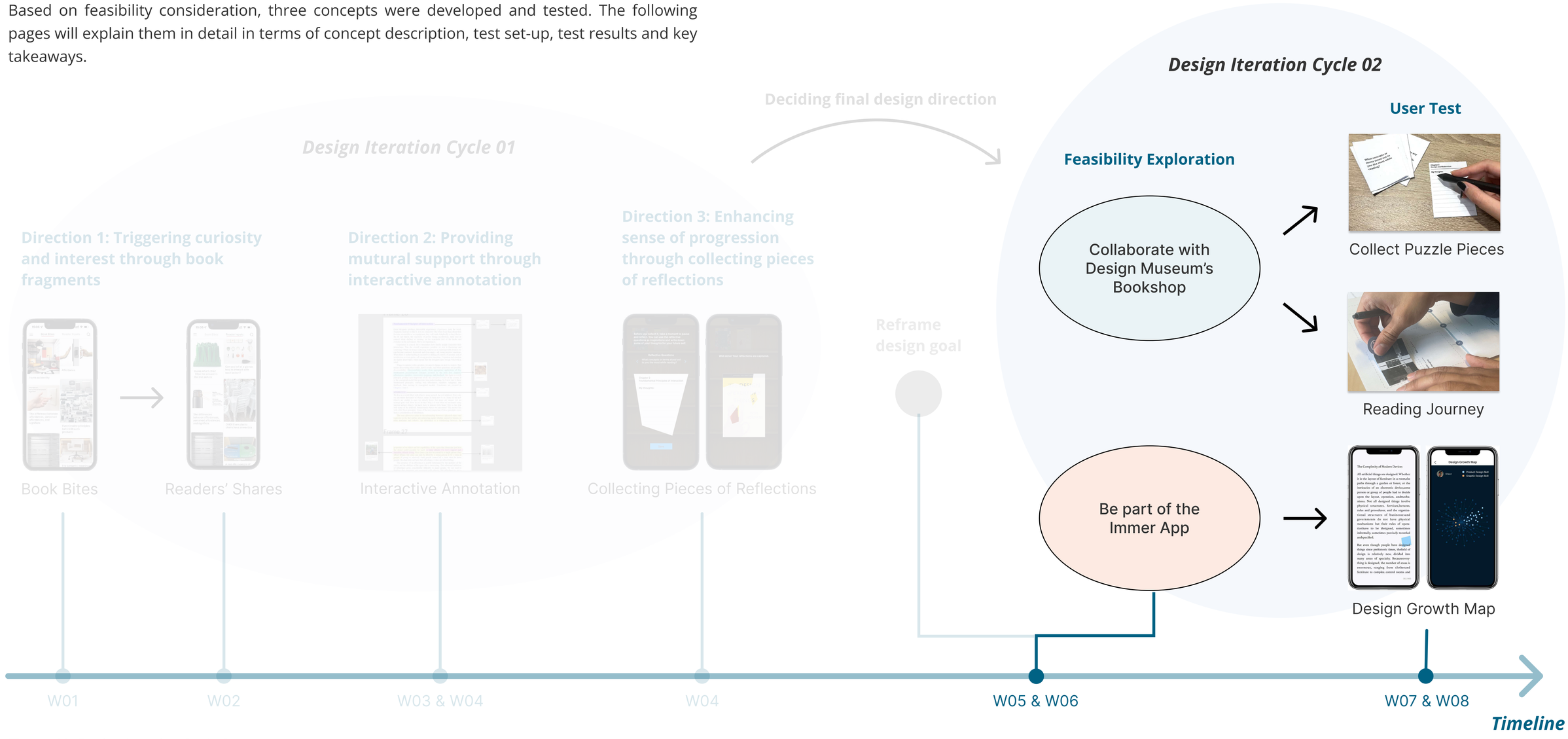


Figure 42. Design Iteration Cycle 2

7.1.2 Feasibility Consideration

There are two possible ways for fitting the design in the real-world setting.

Collaboration with the Design Museum's Bookshop

One potential implementation is through partnering with the Den Bosch Design Museum's Bookshop. Visitors purchasing books would get a physical toolkit designed to enhance their reading experience. This method leverages the museum's established audience and provides a tangible, interactive element to the reading process. However, the necessity of integrating seamlessly with the bookshop's offerings may pose challenges. Additionally, this approach may limit exposure to the intervention, reaching primarily the museum's existing audience rather than a wider demographic.

Being part of the Immer App

Another feasible approach is collaborating with the Immer App, a platform dedicated to enhancing the reading experience through technology. Immer shares similar goals of engaging readers before, during, and after their reading journey. While my project targets a specific audience and book type, it has the potential to be extended to a broader range of readers and genres. However, ensuring financial viability from the company's perspective is also crucial. Detailed considerations of this aspect can be seen in section *8.3 Desirability, Feasibility & Viability.*

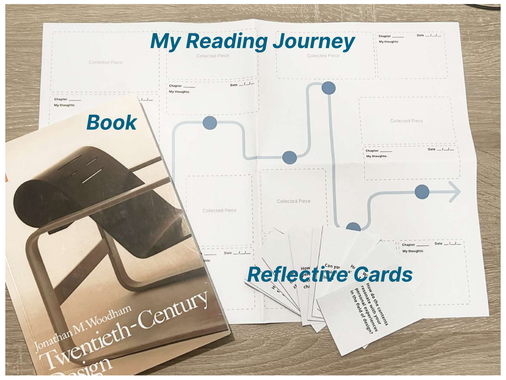
Figure 43. Direction 1: Collaboration with the design museum's bookshop

Figure 44. Direction 2: Being part of the Immer App

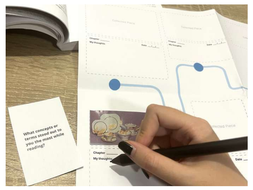
7.1.3 Three Concepts for Cycle 2

Collaborate with Design Museum's Bookshop

Concept 1: My reading journey

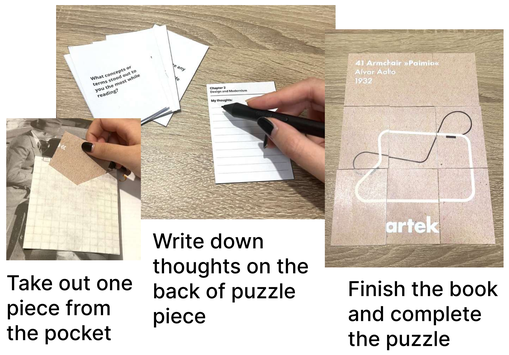


Encounter one milestone in the book



Stick it to the map & Write down thoughts

Concept 2: Collecting puzzle pieces



Take out one piece from the pocket

Write down thoughts on the back of puzzle piece

Finish the book and complete the puzzle

Figure 45. Prototype for Concept 1

Figure 46. Prototype for Concept 2

The designed toolkit in Concept 1 includes strategically placed several milestones throughout the book, a reading journey map, and cards with reflective questions. As readers progress, they encounter these milestones, each featuring an image, prompting them to pause and reflect using the provided cards. Readers can tear out the images, stick them onto the reading journey map, and write down their thoughts. Over time, they can collect all the milestones along with their reflections, gradually filling up the map.

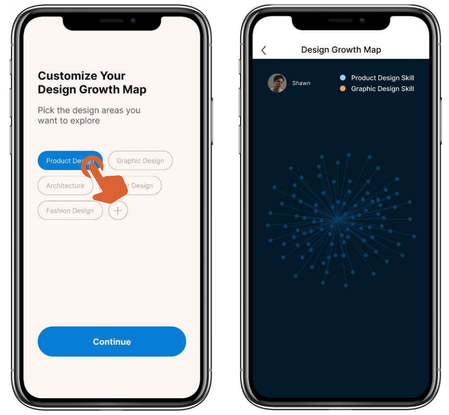
The success of this concept relies heavily on the quality and relevance of the reflective questions, which need to be thoroughly tested and evaluated through user feedback.

Unlike Concept 1, this concept grants readers more autonomy and freedom. Readers can choose when to reflect, taking out a puzzle piece whenever they have thoughts about the content they've read, and writing their reflections on the back. Upon finishing the book, they will have a completed puzzle with all their notes and thoughts on the reverse side. However, the effectiveness of this approach hinges on the readers' intrinsic motivation and discipline to engage with the reflection process independently, which may vary significantly among individuals. Additionally, the appeal and usability of the puzzle mechanism need to be critically evaluated to ensure it enhances rather than detracts from the reading experience.

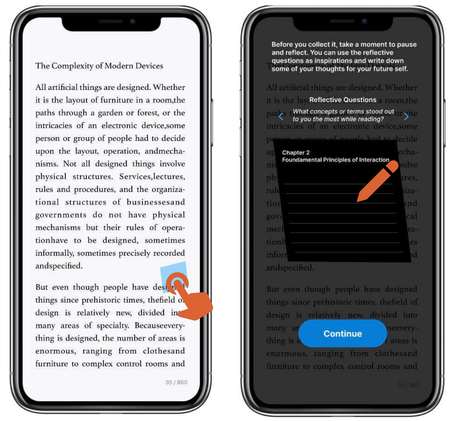
Be part of the Immer App

Concept 3: Design growth map

Pre-reading: customize the skill tree template



Encounter the milestone & write down reflections



Define the field for it & collect it in the growth map

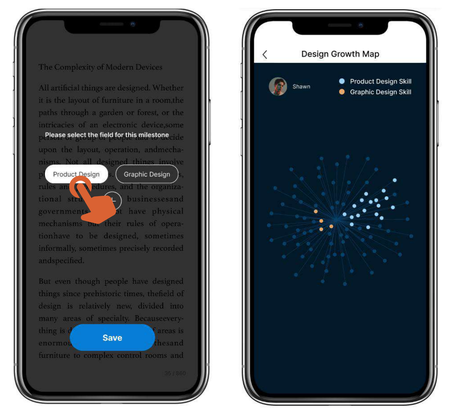


Figure 47. Prototype for Concept 3

Concept 3 introduces the "Design Growth Map" feature. Before starting their reading journey, users predefine the design areas they aim to explore. During digital reading, when they encounter milestones, they can write down their thoughts or reflections on what they've just read. They then categorize each milestone into a predefined field or add new tags if none of the existing options fit. Each newly collected milestone illuminates a new dot on the Design Growth Map.

The step of "predefining design areas" before reading aims to help users reflect on what they want to learn and achieve, fostering a more purposeful reading experience from the outset. However, I could anticipate several challenges with this step. Novice designers may struggle with defining their areas of interest due to limited experience in design and uncertainty about future exploration paths. This initial hurdle could impact their engagement with the concept. Additionally, determining the granularity of the provided choices poses another challenge; while current options like 'product design' and 'graphic design' are broad categories, it remains unclear whether these will sufficiently meet users' needs or if more specific options are necessary.

To address these concerns, thorough evaluation and feedback collection through user testing will be essential.

7.1.4 Test Set-up of Three Concepts

Given that these three concepts are based on the same design goal and will be evaluated and compared together, they were tested simultaneously by the same group of participants, unlike in Cycle 1 where the concepts were tested separately.

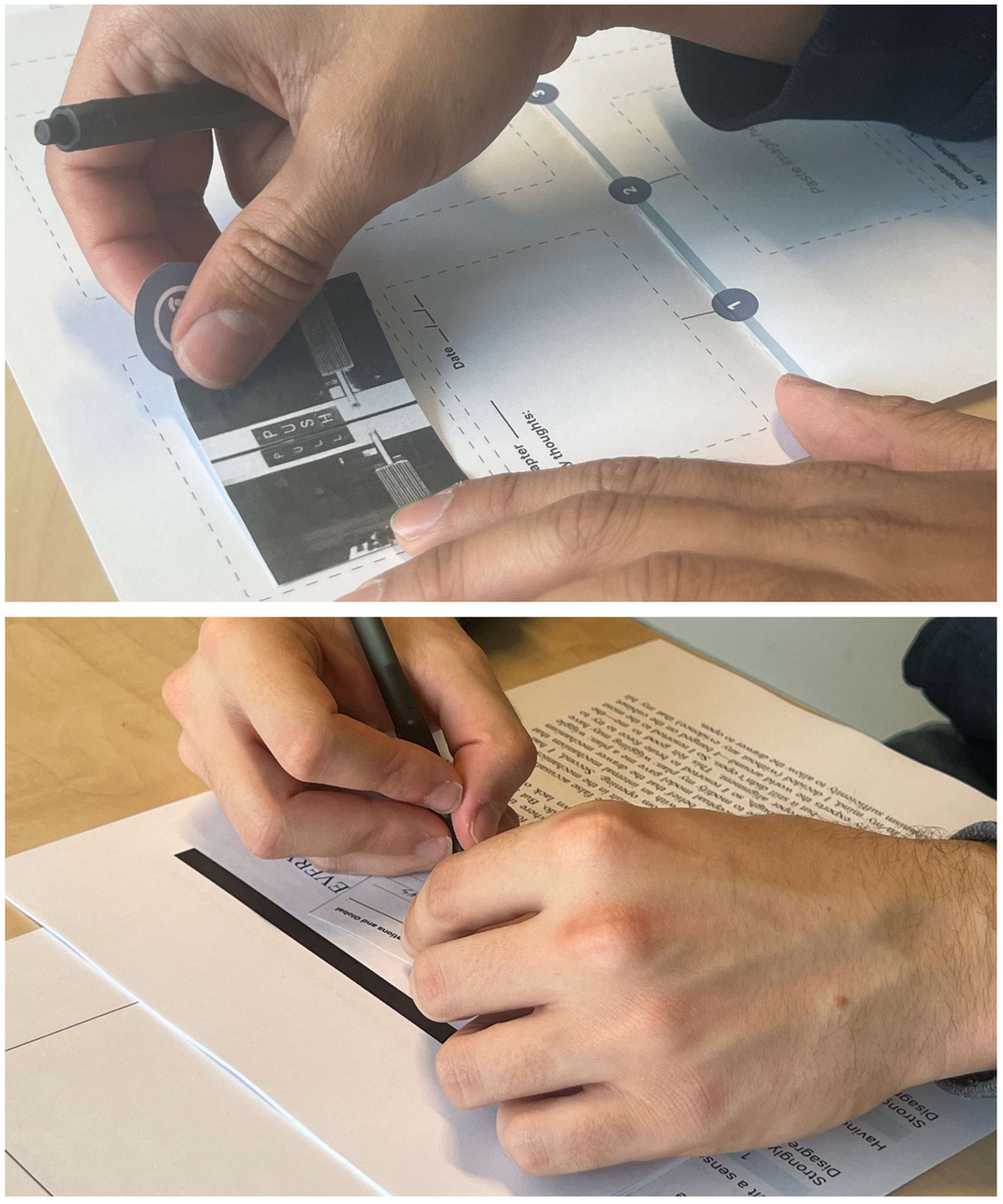


Figure 48. Participants were testing the prototypes

Participants

Four participants were recruited for this test through Whatsapp group of TU Delft Industrial Design Programme, including one bachelor student and three master students. All of them had read some design books before but were not book lovers.

Test procedure

All tests were conducted individually. During each test session, concepts 1, 2, and 3 were tested one by one. After each concept test, open-ended questions were used to gather data about participants' subjective feelings and opinions, and a Likert-Scale was used to evaluate the design goal.

Considering that the sequence of testing might influence participants' evaluations and impressions, a fixed sequence could introduce biases and affect the results. Therefore, I randomized and controlled the sequence during the sessions to minimize potential biases and ensure a more balanced assessment.

P1	*P2*	*P3*	*P4*
Concept1 + *Interview* ↓ *Concept2* + *Interview* ↓ *Concept3* + *Interview*	*Concept2* + *Interview* ↓ *Concept1* + *Interview* ↓ *Concept3* + *Interview*	*Concept3* + *Interview* ↓ *Concept2* + *Interview* ↓ *Concept1* + *Interview*	*Concept1* + *Interview* ↓ *Concept3* + *Interview* ↓ *Concept2* + *Interview*

Figure 49. The sequence of testing

Research questions

1. How do participants perceive the differences between following milestones set by others compared to determining when to stop by themselves?
2. What are the participants' preferences and perceptions regarding the three different reading outcomes: a reading journey map, a puzzle, and a design growth map?
3. How do the three concepts compare in terms of their impact on 'engagement', 'thought-provocation', 'knowledge building' and 'self-growth'?

Prototype

To minimize potential bias and influence from the book's content itself, all three concepts were prototyped using the same book. To account for familiarity with the reading material, each concept used a different chapter from the same book. However, it is undeniable that the differences in content across these three chapters might still influence the test results.

Concept 1 was prototyped with the Chapter 1 of *Twentieth-Century Design.* Two stop points were set up within the chapter, and both the reading journey map and the reflective cards were prototyped using papers.

Concept 2 was prototyped with Chapter 2. Puzzle pieces and the reflective cards were prototyped using papers.

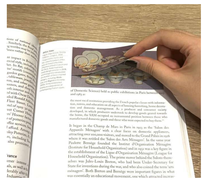
Chapter 3 was prototyped with Chapter 3 using Figma.

7.1.5 Evaluation Results of Three Concepts

Conceptual-Level Evaluation: Overall Effectiveness in Achieving Design Goal

The goal of Cycle 2 was to evaluate three concepts against the four desired qualities and identify effective features for the final design. At a conceptual level, Concept 1 excelled in 'engagement' and 'knowledge-building' due to its milestones and reflection-writing features. Concept 2 also performed well in 'knowledge-building.' Concept 3 was strongest in 'self-growth' thanks to the Design Growth Map. However, none of the concepts were effective in 'thought-provoking' due to overly general reflective questions. Detailed scores for each concept on the four desired qualities are provided in Appendix F.

Concept 1: My reading journey



Encounter milestones in the book

Write down reflections on reading journey

Milestones for pausing and reflecting are perceived as more engaging and interesting by some participants

> *"I love reflecting. Having stop points with questions and doing reflections bring more fun to reading."*
>
> — *Participant 3*

The process of writing reflections and completing the reading journey made some participants feel they were digesting information and accumulating knowledge.

> *"The stop points prompted me to reflect and doing this helped me understand the content more deeply."*
>
> — *Participant 1*

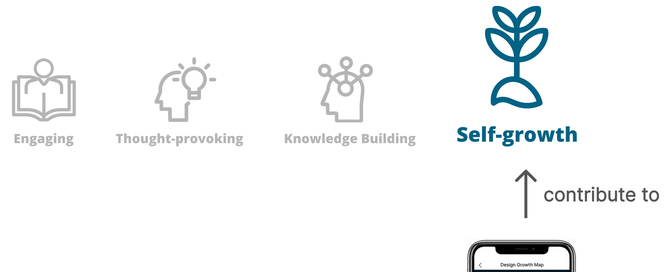
Concept 2: Collecting puzzle pieces

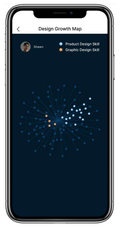
Note down thoughts on puzzle pieces and collect them

Using puzzle pieces to write thoughts feels like regular note-taking and helps participants learn. However, the puzzle did not provide a sense of progress effectively, as participants could not see the puzzle image becoming more complete while writing notes.

> *"I felt that the more I wrote, the more I learned, but it's a pity that I couldn't see the picture getting more complete as I was writing.*
>
> — *Participant 3*

Concept 3: Design growth map





Lighting up points on the growth map

The design growth map offered a strong sense of growing and progression. Some participants perceived the design growth map as a progress tracking system, giving them a tangible sense of making progress.

> *"It's a nice progress tracking system to me. Every time I light up a new point, I feel like I've made some progress."*
>
> — *Participant 2*

Figure 50. Conceptual-Level Evaluation: Overall Effectiveness in Achieving Design Goal

Detail-Level Evaluation: Insights into Specific Preferences

Beyond the conceptual and structural evaluations, open-ended questions provided insights into more specific, detailed design preferences. These insights will inform finer design choices, such as whether users prefer pre-set milestones or autonomous reflection timing, the mindsets users adopt when organizing ideas, and the effectiveness of the reflective questions in stimulating deeper thought. I will discuss the implications of these detailed insights one by one.

Pre-set Milestones vs. Autonomous Reflection Timing: Which Do Users Prefer?

Following pre-set milestones (Concept 1)

Structured

"The stopping points make my reading more structured. Before I would just flip through the book to see the interesting parts."

— *Participant 2*

Guided

"I feel like I'm being guided to read and reflect. I just need to follow the set reading pace."

— *Participant 4*

More fun

"I love reflecting. Having stop points with questions and doing reflections bring more fun to reading."

— *Participant 3*

Decide when to stop by themselves (Concept 2)

More autonomy

"I have more sense of autonomy since I can add moments by myselves."

— *Participant 1*

Too much freedom

"For the preious one I knew there are some stop points and I could just followed them. For this one it's a bit challenging to decide when to stop. I can detaily make one note for every paragraph but I can also only do one for the whole book. I have too much freedom."

— *Participant 3*

Overwhelmed

"Reading is already challenging for me. With this, I also need to decide if a concept is important enough to taking notes. That makes me feel even more exhausted."

— *Participant 2*

Contrary to expectations, the approach of setting milestones in Concept 1 received more positive feedback. Although allowing users to decide when to pause and reflect provides them with a greater sense of autonomy and control, this is not always what they desire. Some users find it challenging to determine when to stop and record their thoughts, as they are unsure whether to take detailed notes on every paragraph or to summarize the entire book, leading to hesitation and uncertainty. Furthermore, some users feel overwhelmed by the need to decide whether the content they read is significant enough to be noted, especially when reading itself is already a difficult task for them.

Additionally, milestones with reflective questions are perceived as more engaging and interesting by some, while spontaneously taking notes feels more like an academic exercise which is very similar to their usual study habits.

Different mindsets for organizing ideas (Concept 3)

Architect Mindset

“I certainly want to use the additional opptions with the ‘plus’ sign. I want to create my own categories, first larger folders and then smaller detailed folders that correspond to my own mind map.“

——— *Participant 1*

Librarian Mindset

"I can imagine that I’m doing a project about tangible interaction, and I hope to seek related information from the book. I will filter and cluster my ideas based on different topics of my project."

——— *Participant 3*

Gardener Mindset

"When I read, I collect all my small ideas and inspirations no matter what they are, then I will go through them and organize them later."

——— *Participant 2*

"It is difficult for me to build a framework before reading, because I am not sure what kind of information and ideas I will gain from the book."

——— *Participant 4*

Figure 51. Three mindsets for organizing ideas

A detailed introduction to these three different mindsets for organizing ideas is provided in *3.3 Mindset of Notetaking*; please refer to it if needed. Testing revealed that only one participant closely aligned with the Architect mindset. This participant preferred to predefine categories for the ideas anticipated from the book but chose to create a personal classification system based on his mind map rather than using the provided categories. The other three participants exhibited varying degrees of hesitation towards predefining categories and structures.

Two participants, who aligned more with the Gardener mindset, expressed that they were accustomed to collecting all information first and organizing it later. They found it difficult to predict and categorize ideas before reading, as they were unsure of what the book would yield. The participant inclined towards the Librarian mindset found the provided classification options too broad and preferred to cluster her ideas according to the themes of her current projects.

Effectiveness of the reflective questions (In concept 1&2)

The reflective questions on the cards were designed based on the literature research on levels of reflection in reading by Too (2013). According to his research, five phases of reflection are identified: identification, association, integration, analysis, and transformation. For each of these phases, I developed several targeted questions.

During the test, The testing revealed varied participant behaviors regarding the reflective question cards. Some participants reviewed these cards before and during reading, finding that approaching the text with these thought-provoking questions enhanced their reading experience. Others chose to refer to the cards only when they encountered stop points, and one participant did not use the cards at all.

Overall, participants felt that the reflective questions were of limited inspiration due to their broad nature and lack of specific relevance to the reading material. Additionally, one participant noted that while familiarity with the questions could foster a habit of reflection, it also led to a loss of novelty, making the experience feel repetitive and dull.

Figure 52. Reflective cards with questions

7.2 Key Takeaways & Design Choices

7.2.1 Chosen Design Features for Final Concept

Overall, the Cycle 2 test results show that each concept has distinct strengths in meeting the design goals. The final concept combines the most effective features from each.

To enhance reading engagement, the feature of pre-set milestones with reflective questions was chosen. This feature added an element of fun and interaction. However, because the same set of reflective questions is used for all milestones, readers may eventually find them monotonous due to their familiarity and predictability. This aspect needs to be refined to sustain engagement and interest.

In terms of thought-provocation, this mainly relies on the reflective questions provided. However, the current questions were found to be insufficiently stimulating, as they were too general and not well-connected to the specific content of the book. This requires further improvement to effectively provoke deeper thinking.

In regard of knowledge-building, the feature allowing users to write down reflections and thoughts proved beneficial for digesting content and accumulating knowledge.

As for self-growth, the design growth map feature shows potential for further development. By converting reflections into visible progress within the Design Growth Map, readers can track their development in the relevant design area and experience a sense of accomplishment. However, users struggled with the step of predefining knowledge categories since many of them belong to the Gardener and Librarian mindsets. This issue needs to be addressed in future refinements.

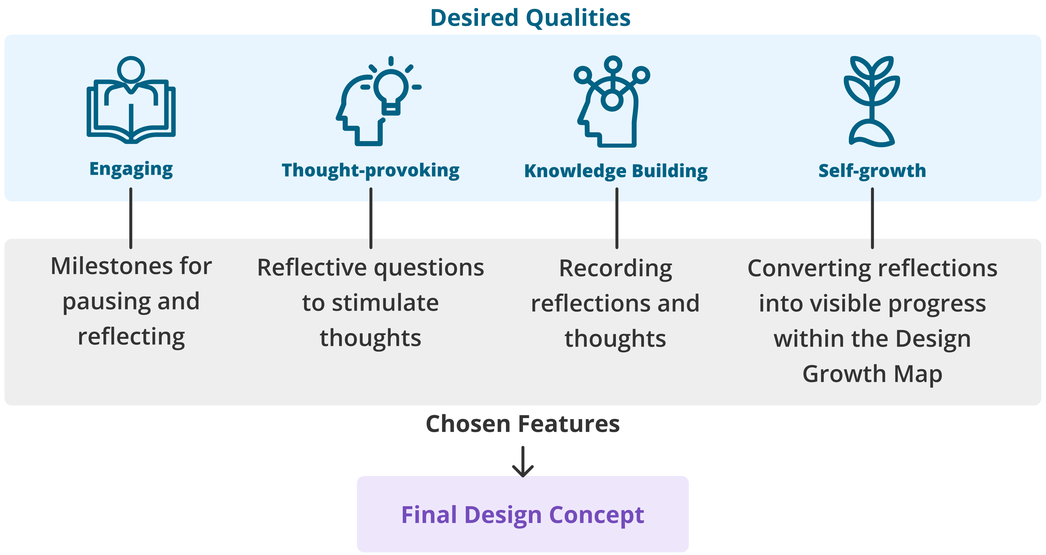


Figure 53. Chosen Design Features for Final Concept

7.2.2 Opportunities for Final Design Iteration

Although main features has been chosen to be the final design concept, there is still a room for each feature to be improved. In the Final Design Iteration, the following aspects were taken into account:

Unpredictable and specific questions for each milestone

User tests revealed that fixed, generic reflective questions were not only insufficient in stimulating deep thought but also prone to causing boredom over time. To maintain engagement and encourage more meaningful reflection, it would be beneficial to tailor these questions to the specific content of each milestone. This could be achieved by having the book's author or professors with relevant teaching goals design the reflective prompts. A detailed explanation of the feasibility of this idea and roles involved can be found in *Section 8.3 Desirability, Feasibility & Viability*.

Collect ideas first and organize them afterward

Research from cycle 2 indicated that many readers without an architectural mindset found predefining the categories and structure of the design growth map challenging. The main reasons were twofold: firstly, novice designers often lack clarity and certainty about the design fields they wish to explore in the future, making it difficult for them to comprehensively plan the skills and knowledge they want to acquire.

Secondly, many people find it hard to predict and categorize ideas before reading, as they are uncertain about what they can get from the book.

Considering these factors, in the final design iteration, the process of predetermining the structure of the growth map was eliminated. Instead, users are allowed to collect information and ideas first and organize them afterward.

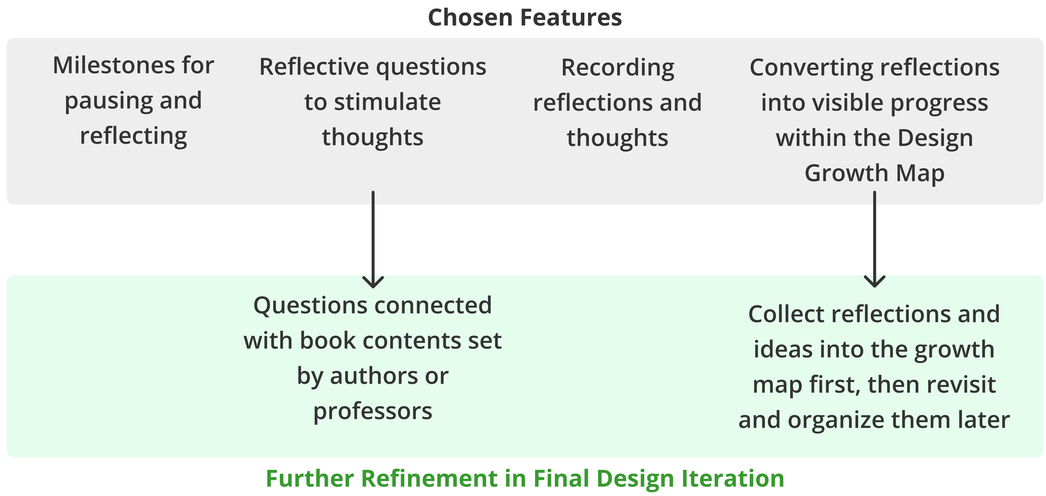


Figure 54. Opportunities for refinement in Final Design Iteration

Chapter 8
Final Design Iteration

This chapter centers on the Final Design Iteration, aiming to refine the details of the final concept and select the appropriate tool for creating the final prototype. It is divided into three key sections: the primary user flow of the final design, the tool selected for developing the high-fidelity prototype, and the considerations of desirability, feasibility, and viability. To refine the user flow and design features, a self-test was also conducted.

Final Design and Validation

Chapter Overview

8.1 Final Design Iteration: Refining Details of the Final Concept

The final design iteration contains three primary considerations: the interaction flow of the final design, the appropriate tool for creating a high-fidelity prototype, and the desirability, feasibility and viability of the final design. To evaluate and refine first two aspects, I conducted a self-test. The following sections will introduce each of these considerations in detail.

8.1.1 Main Use Flow

During reading

Given the user feedback from previous research and tests, which showed a preference for physical books, the final prototype incorporates a combination of a physical book, physical milestones and a digital growth map. However, this does not imply the complete abandonment of e-reading, as it still offers certain advantages in terms of flexibility. In the future, there may be the potential to develop both physical and digital milestones to accommodate the diverse needs of different readers.

While reading, readers will encounter some milestones along with the reflective questions. For reflective questions, General questions did not yield effective results in tests, so the final iteration will use more specific questions tailored to the book's content. I evaluated this approach in the self-test later.

In order to collect the milestone into the design growth map, readers need to write down their reflections and thoughts based on the reflective question. For this part, I provided two options to accommodate different preferences. Readers can scan the QR code on the milestone to access the app and record digital notes. Alternatively, those who prefer not to use their phones during reading can tear down the milestone sticker and write their thoughts on the back. They can later scan the handwritten notes into digital format.

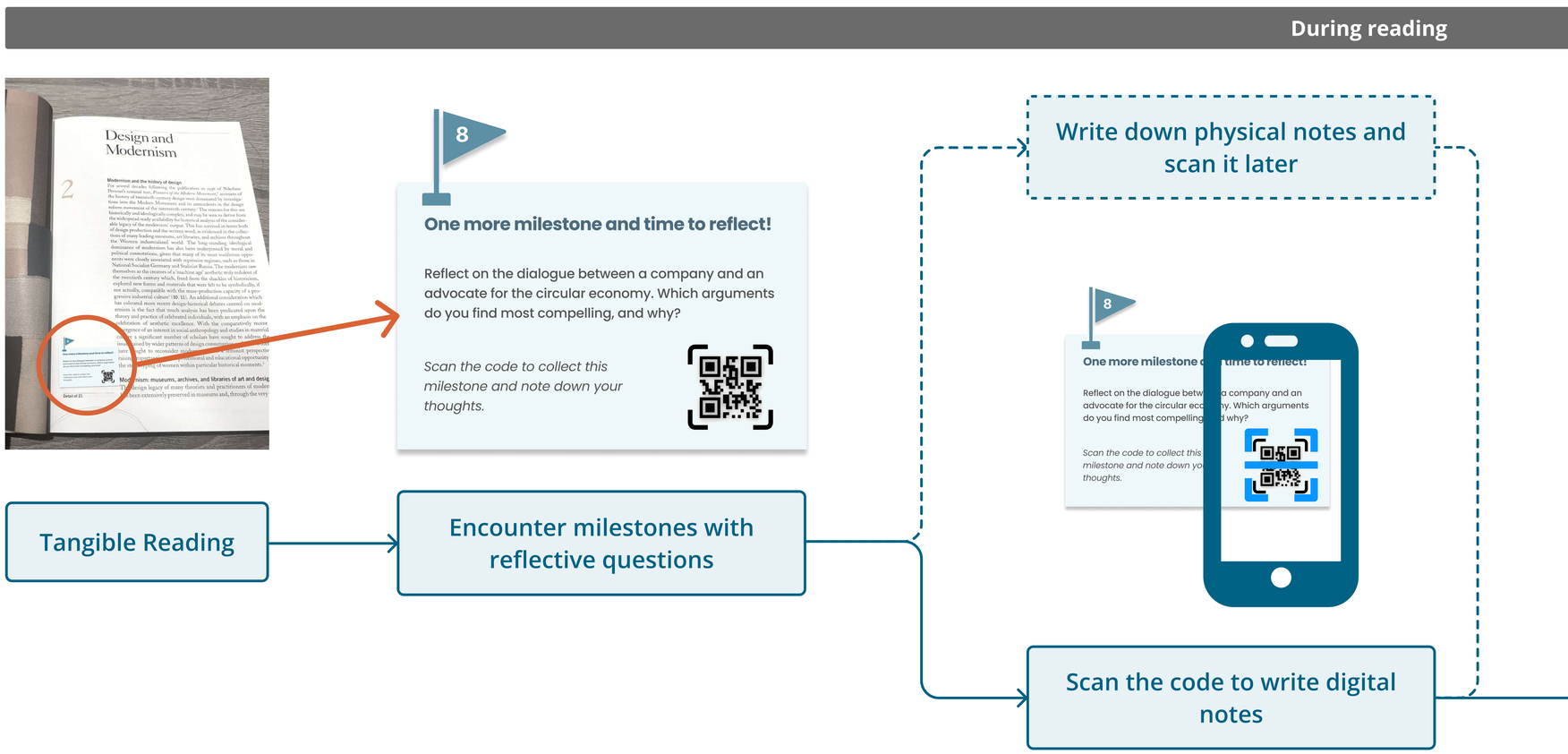


Figure 55. Main use flow

After scanning the code, the app displays the number of milestones achieved and encourages readers to take a moment for reflection.

In the note-taking interface, the main task is to write down their thoughts and reflections. The system automatically detects the reader's location in the book and links the note to the relevant chapter. Readers can also add images or links to other related notes.

Additionally, I am also considering that if readers find the reflective question not inspirational enough, they can consult AI for alternative prompts. I evaluated this function later in the self-test.

After finishing the note, they need to consider which design field or skill this note relates to and give a tag to this note.This tagging step is optional; if readers are unsure at the moment, they can leave the tag blank

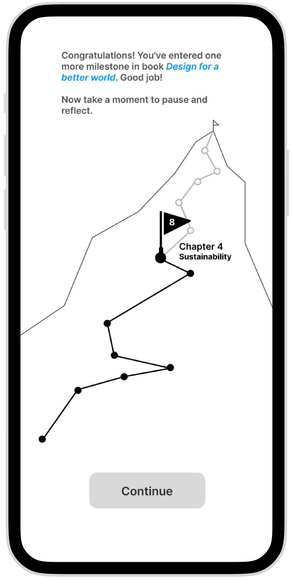
and return to it later when they have a clearer idea.

Once the note is saved, an additional dot will be added to the Design Growth Map, reflecting the progress made.

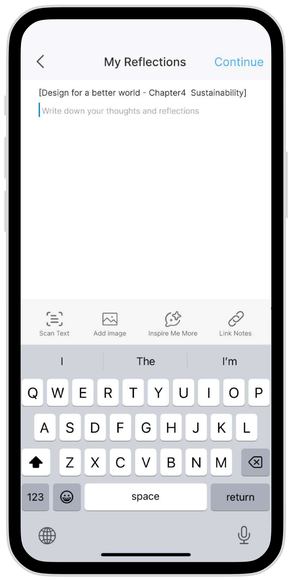
After reading

Readers can interact with the Growth Map after reading. They can revisit and edit their notes, establish connections between related notes by adding links, and assign tags to notes that were previously left undefined. This functionality enhances the organization and accessibility of their reflections and insights.

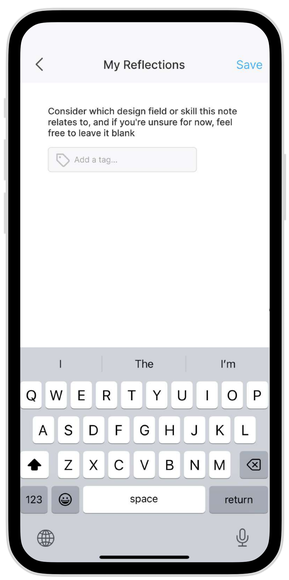
After reading



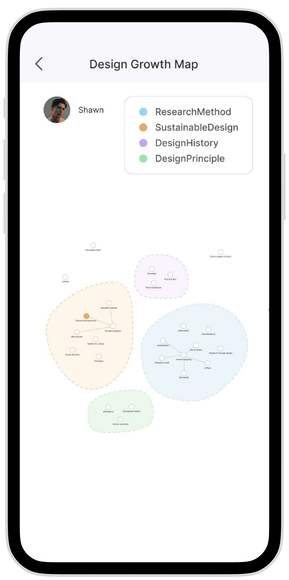
See where I am in the whole book



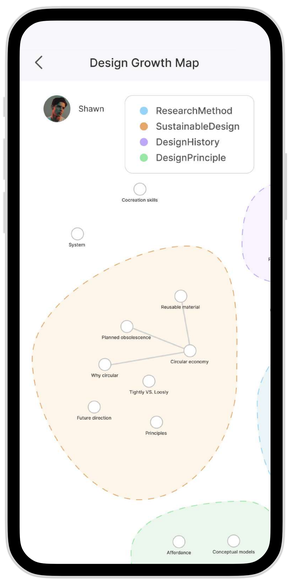
Write down thoughts & Reflections

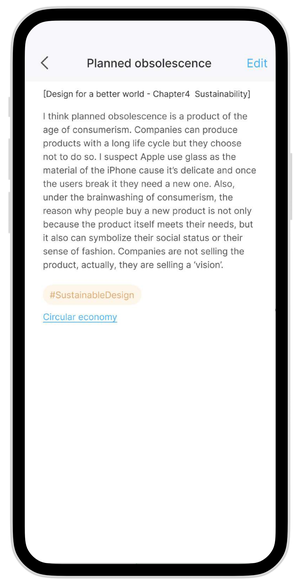


Give a tag to it (optional)



Save the note to the design growth map





Revisit the notes, edit notes or organize them

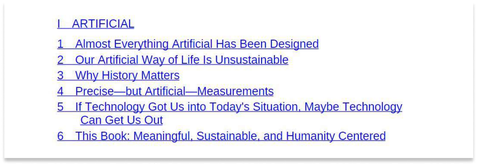
8.1.2 Self-test with the book *Design for a better world*

Based on the use flow, I decided to evaluate it by myself with Don Norman's new book I didn't read before: Design for a better world. The reason why I adopted self-testing is that, as a novice designer, I wanted to gain firsthand experience and insight into the effectiveness of the concept. This approach allowed me to identify major issues and areas for further improvement. Additionally, given that it is summer vacation and finding students from the faculty is challenging, self-testing was a practical solution due to resource constraints.

Reading Material Chosen

The digital version of the book *Design for a better world* was chosen. Due to the time limitation, I didn't finish the whole book. Instead, I chose to firstly read the first chapter without any interventions to give myself a basic context of the book, and then read the third chapter out of my personal interest. When reading the third chapter, I used the designed interventions and followed the interaction flow.

First Part-Artificial (Read without interventions)



Third Part-Sustainable (Read with interventions)

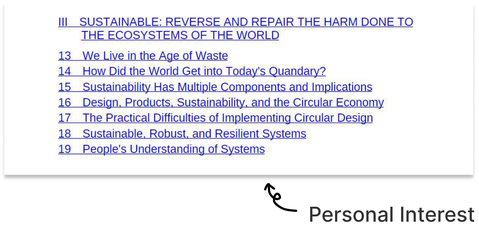


Figure 56. Chapters chosen for self-test

Prototypes

For the milestones, since there were no pre-established milestones, I set them myself.

Regarding the reflective questions, I utilized generative AI to assist in creating reflective prompts. I provided ChatGPT with the pdf version of the contents I had read and requested it to generate questions based on that material.

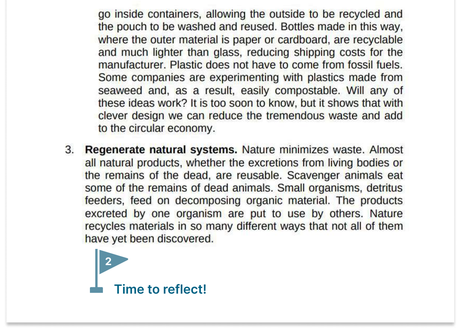


Figure 57. Milestones set in the chapter

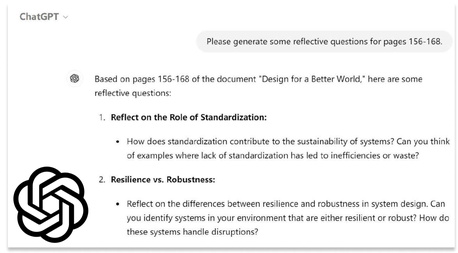


Figure 58. AI help gengerate questions

To document my thoughts, I used the note-taking app Obsidian and aimed to evaluate its potential in assisting in final prototype creation. This app allows organizing notes after collecting them, aligning with my design concept. While Obsidian cannot fully replicate the interaction and visual effects of the Design Growth Map, its graphical view feature offers a way to visualize the relationships between notes and their associated tags.

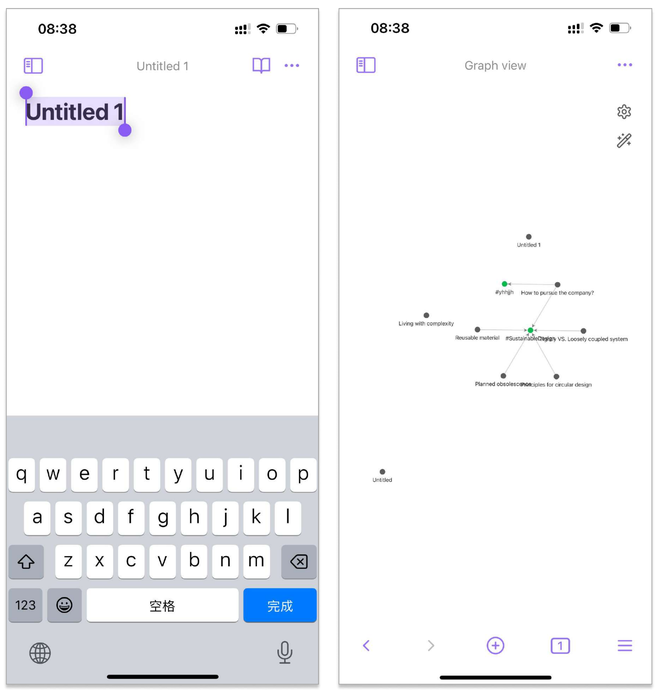


Figure 59. Obsidian for note-taking

Interaction Process

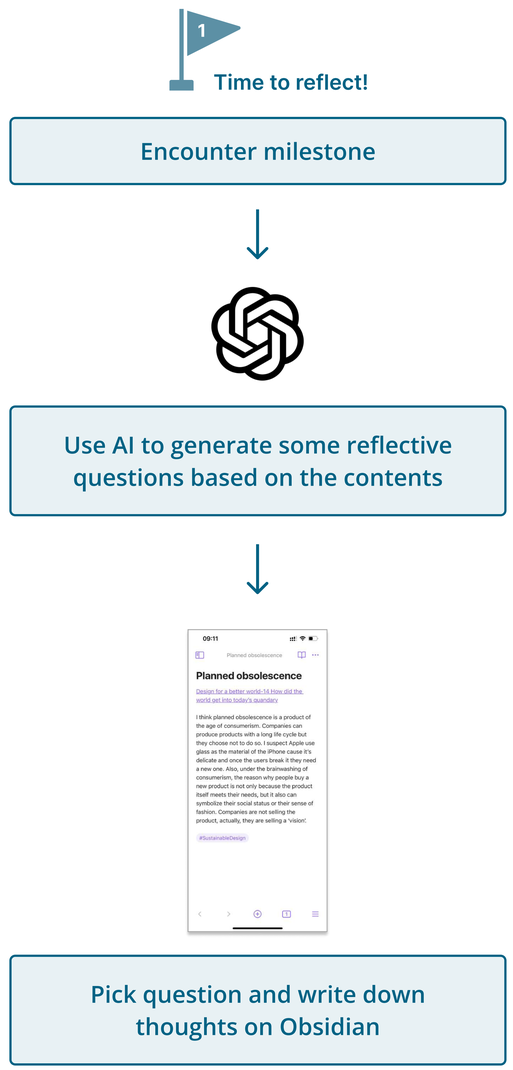


Figure 60. Interaction process

Questions used to reflect

During the test, I found that the most inspiring questions for me were those that prompted me to express my personal opinions on the author's statements. Some example questions are listed below, and more reflective questions can be found in Appendix G.

2 *Can you recall the key principles of the circular economy, and do you believe that adopting a circular economy strategy is a viable path towards achieving sustainability?*

3 *Reflect on the statement that "the best solution is to eliminate most recycling and instead focus on direct reuse of the materials." Do you agree with this approach? Why or why not?*

4 *Reflect on the dialogue between a company and an advocate for the circular economy. Which arguments do you find most compelling, and why?*

8.1.3 Results of the Self-test

Subjective feelings of this experience

Engaging & Better memory

The sense of engagement primarily stems from two sources. First, as a reader, the process of reflecting on the provided questions and recording personal thoughts made the reading experience more immersive. Second, as a designer, interacting with AI to generate reflective questions enriched the experience, as it required me to review and consider each question, selecting the ones I found most inspirational. This process encouraged deeper reflection on the content. Additionally, I noticed that the third chapter, where the intervention was applied, left a much stronger impression on me compared to the first chapter.

Exhausted

Typically, only one or two out of ten AI-generated questions meet my expectations. Generating suitable questions often requires ongoing dialogue and prompt adjustments, which can be exhausting. Additionally, repeatedly writing down the chapter number and section name manually is cumbersome.

Fulfilment & Accomplishment

Seeing many new notes added gives me a sense of accomplishment.

Key takeaways for final prototype

Obsidian is a powerful note-taking tool, but it is not well-suited for direct use in creating the final prototype

There are three main reasons why Obsidian is not suitable for direct use in creating the final prototype.

Firstly, the concept of a 'Design Growth Map' is not easily perceived within Obsidian's interface. Although the graph view feature visualizes the connections between different notes and tags, it does not effectively convey the idea of a growth map due to its visual limitations.

Secondly, it is challenging to integrate Obsidian's interfaces seamlessly with other designed interfaces. The intended interaction flow allows readers to collect milestones and save their thoughts into the design growth map, requiring multiple interfaces. However, according to GitHub documentation, Obsidian is not fully open for editing. While some plug-ins are allowed, it doesn't support altering the connections between interfaces or adding new ones. Therefore, other prototyping tools like Figma is needed, but these prototyped interfaces cannot be seamlessly integrated with Obsidian's interface.

Lastly, while Obsidian is a functional note-taking tool, it is not beginner-friendly and has a learning curve. Considering that not all target users are familiar with Obsidian, this complexity might deter them from engaging with the designed intervention. The final prototype requires simpler and more intuitive interfaces to ensure accessibility and ease of use for all users.

A well-trained AI can assist in providing more reflective questions

Through test, I see the potential of AI assisted in generating questions. On one hand, generative AI could support authors and professors in formulating insightful questions, potentially reducing their burden. On the other hand, if readers find the initial set of questions not inspirational enough, they could interact with AI to generate others, thus providing them with greater autonomy and flexibility.

However, this 'inspire me more' function presents potential limitations. One concern is that users may become prone to seeking an ever-increasing number of questions, leading to a risk of cognitive overload. Another consideration is related to the quality of the questions generated. To cope with this, incorporating a rating system for questions can help ensure quality and allow the AI model to be continually refined based on user feedback.

Allowing readers to place milestone stickers in the book before reading

In the self-test, I placed the milestones by myself. I found that doing this helped me mentally mapping out the structure of the chapter. Furthermore, from a practical perspective, allowing readers to place the milestone stickers themselves, based on the provided chapter and page numbers on stickers, could be a more flexible approach than pre-printing them in the book. This method wouldn't affect already published books, making it a promising approach worth exploring.

8.1.4 Conclusion of Design Choices For Final Concept

Overall, there are four main design choices based on both use flow and self-test:

- **Integration of Physical and Digital Elements:** The final prototype will combine a physical book, physical milestones, and a digital growth map. This hybrid approach aims to cater to different user preferences and enhance the overall reading experience.

- **Exclusion of Obsidian**: Based on user feedback and practical considerations, Obsidian will not be included in the final prototype. This decision reflects the need for a more intuitive and seamless tool for users to interact with the design.

- **Potential of Generative AI**: Generative AI showed potential in assisting with the creation of reflective questions, adding an interactive and thought-provoking element to the design.

- **Inclusion of Milestone Stickers:** Based on the practical benefits and user experience, milestone stickers will be included in the final prototype. This decision reflects the need for a flexible and adaptable method for readers to segment their reading material without altering already published books.

Before finalizing the prototype, several critical considerations remain:

- **Market Feasibility and Stakeholder Involvement**: It is crucial to explore how the final design concept can be implemented in the real market, identify relevant stakeholders, and determine how they can contribute to making the design feasible. This will be addressed through an analysis of desirability, feasibility, and viability in the subsequent *section 8.3 Desirability, Feasibility & Viability.*

- **Selection of Prototype Tools**: The appropriate tool for creating the high-fidelity prototype needs to be identified. After conducting research, Protopie has been identified as a potentially effective tool for realizing the design's functions. This tool was introduced in *section 8.2 Final Prototyping Tool*.

- **Integration of Generative AI**: The role of generative AI in the final design must be carefully considered, ensuring that it supplements the concept without overshadowing the core features. The limitations and future potentials about the application of generative AI will be discussed in *section 10.2 Limitations & Recommendations*

8.2 Final Prototyping Tool

Protopie was used to creat a high-fidelity working prototype. The purpose of this final prototype is to conduct a final evaluation through role-playing, providing valuable insights for further development. Additionally, this working prototype serves as an effective tool for clearly communicating the concept to the audience.

Compared to Figma, Protopie is better suited for my project. Since recording reflections and thoughts is a key aspect of my concept, my users need to be able to type and input their thoughts directly within the prototype.

Protopie allows for this by enabling the use of the mobile keyboard, which Figma cannot do.

Another advantage of Protopie is its capability to create an interactive map. It can easily handle gestures like zooming in, zooming out, and swiping or dragging, which perfectly aligns with the desired interactions for the Design Growth Map. Figma struggles to simulate these kinds of interactions. This is why Protopie was chosen to create the final prototype.

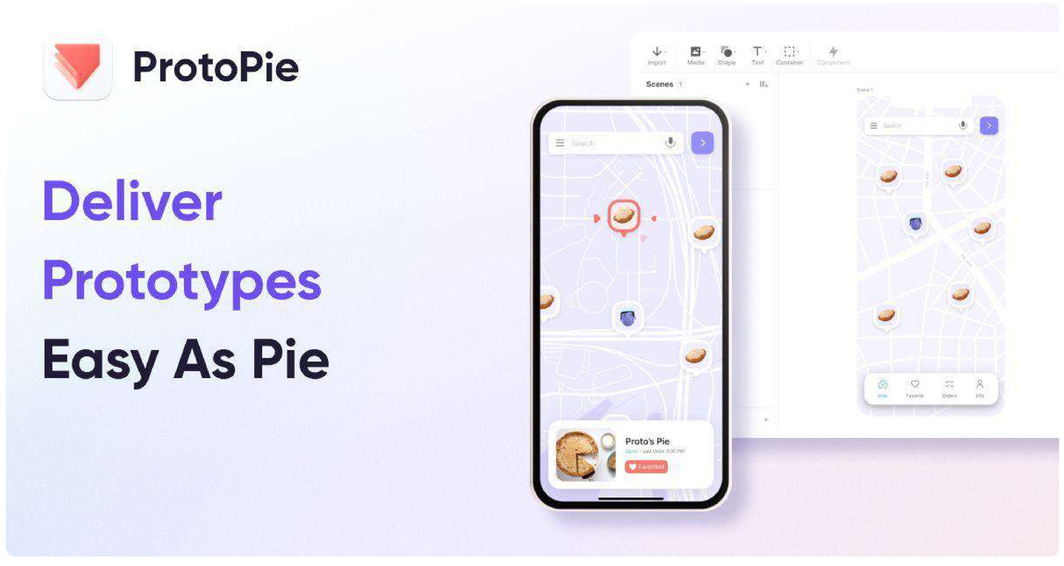


Figure 61. Protopie chosen to be the final prototyping tool

8.3 Desirability, Feasibility & Viability

Some design courses at universities like TU Delft have required or recommended reading lists, offering an excellent opportunity to integrate an interactive reading system into academic settings. The university could potentially secure grants and funding focused on educational innovation from government sources and use these funds to co-develop the app with Immer, a provider of reading technology. Both professors and authors could develop reflective questions and milestones, with publishers being responsible for producing sticker packs that feature these elements. These sticker packs could be bundled with the books and distributed as toolkits that include both the packs and the app. Bookstores could work with the university to ensure these bundles are available at a reasonable price, making it easy for design students to purchase them. This coordinated effort among the university, Immer, professors, authors, publishers, and bookstores would ensure the successful implementation and adoption of the system, ultimately enriching the learning experience for novice designers.

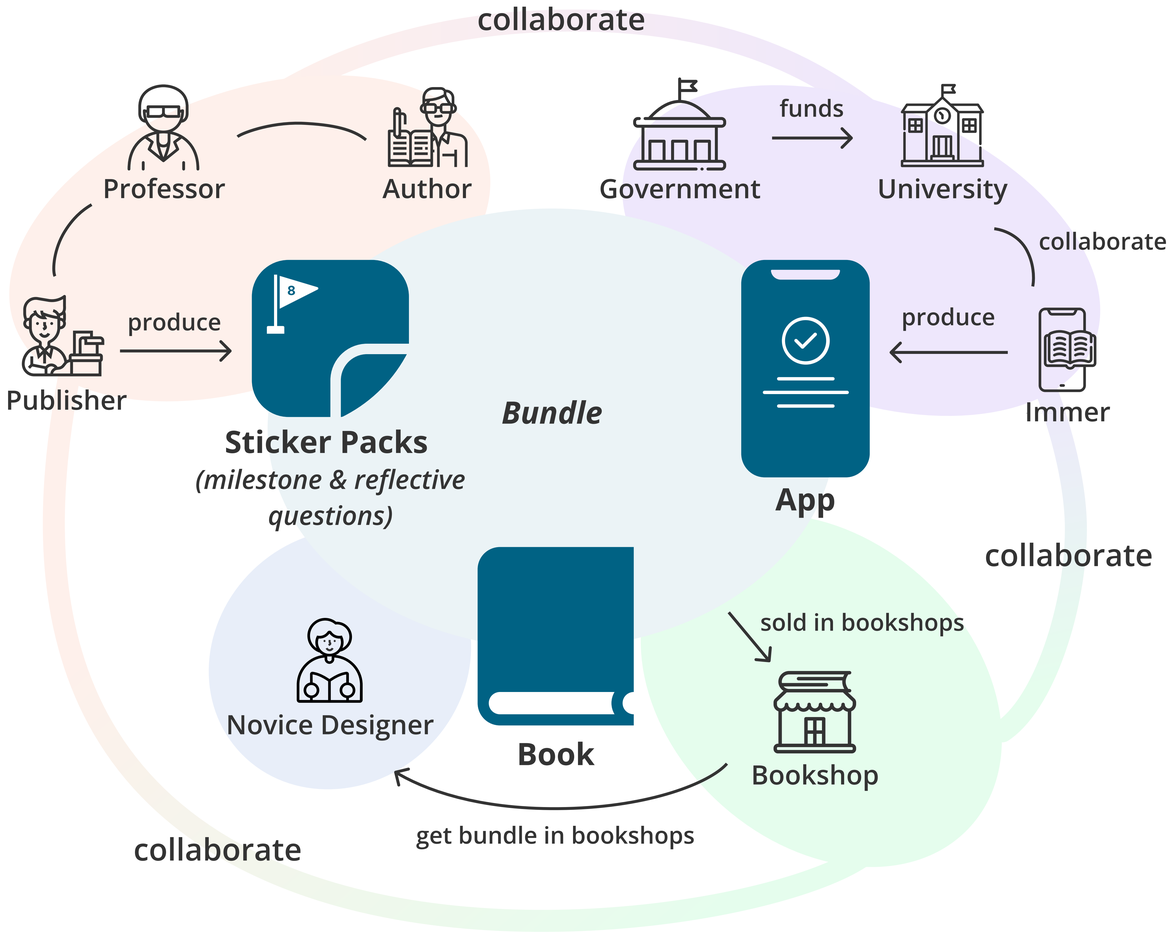


Figure 62. The roles and responsibilities of different stakeholders

8.3.1 Feasibility

The implementation of this concept is feasible due to the existing infrastructure and collaborative potential among stakeholders.

University

The feasibility of implementing the interactive reading system at the university is supported by multiple factors: the potential to secure grants and funding focused on educational innovation, existing infrastructure that facilitates the integration of new educational tools, and strong collaborative relationships with authors, publishers, and educational technology developers like Immer. The university can leverage these partnerships to ensure the toolkit and app align with academic standards and course objectives. Professors are likely to support the project, contributing to the development of reflective questions and milestones, which enhances the system's pedagogical value. Additionally, partnerships with bookstores to offer the bundled products at discounted prices ensure accessibility for all students. Overall, these elements combine to make the adoption of the interactive reading system highly feasible.

Immer

Immer's previous experience collaborating with educational institutions, such as their partnership with Erasmus University to develop software focused on reading and mental wellbeing, underscores their capability in this domain. Leveraging their expertise in developing reading-related technologies and their history of successful educational collaborations, Immer is well-positioned to handle the digital aspects of this toolkit. Their existing technology and specialized knowledge ensure they can effectively create and maintain the app, providing a seamless and engaging user experience for students and aligning with the educational goals of the university. This strong foundation significantly enhances the feasibility of the project.

Publisher

For publishers, the feasibility is bolstered by their existing production and distribution capabilities. Publishers can produce the sticker packs with reflective questions and milestones and bundle them with the books, utilizing their well-established distribution networks to ensure wide availability. Their collaboration with authors and professors to develop content ensures that the material is pedagogically sound and aligns with course objectives.

Bookstore

Bookstores can easily integrate the bundled products into their inventory and promote them to students, especially when these bundles are required or recommended for courses. Additionally, collaborations with the university to offer the bundles at discounted prices can drive sales and ensure affordability for students.

8.3.2 Desirability

Novice Designers (Design Students)

Previous research indicates that design students often find reading unengaging and feel that the effort required outweighs the perceived value. To handle these issues, multiple tests and evaluations showed that the designed intervention can help enhance students' appreciation of the value of reading and foster a sense of self-growth. At the same time, another motivation to purchase this bundle will likely stem from course requirements or recommendations from their professors, given that this designed intervention functions as an educational toolkit.

University

For the university, adopting the interactive reading system aligns with its goal of enhancing educational quality and student engagement. By integrating this innovative tool into design courses, the university can possibly improve learning outcomes.

Professors

For professors, the interactive reading system offers significant desirability by enhancing their teaching effectiveness and student engagement. The structured milestones and reflective questions embedded in the toolkit can provide a consistent framework that aligns with course objectives, making it easier to guide students through complex design concepts.

Immer

Immer can expand its market reach and enhance its reputation by developing a successful educational tool. The collaboration provides opportunities for growth and development, both in the educational sector and beyond.

Publisher

Publishers can capitalize on the growing market for interactive and engaging educational tools. By bundling the book with the toolkit, they can offer a unique product that stands out in the market, potentially increasing sales and opening up new revenue streams from both physical and digital sales.

Bookstore

Bookstores can leverage this bundle to attract more students, offering a product that not only meets course requirements but also enhances the learning experience. Collaborating with the university to sell the bundle at a discounted price can drive sales and foster a closer relationship with the academic community.

8.3.3 Viability

Novice Designers (Design Students)

For design students, the long-term viability of the system depends on its ability to continually enhance their learning experience and professional development. While initial engagement may be high, the system must evolve to remain relevant and valuable throughout their educational journey. There is a risk that if the interactive elements become repetitive or fail to integrate with new technologies and learning methods, students may lose interest. Ensuring that the toolkit consistently provides value and supports students' evolving needs is a challenge.

University & Professors

For the university and professors, the viability of the system hinges on its effectiveness in improving student outcomes over multiple academic cycles. Long-term adoption depends on positive feedback from both students and faculty, as well as demonstrable improvements in student engagement and learning.

Another consideration is about the system’s ability to consistently secure funding for educational innovation. While initial grants can kickstart the project, sustained financial support is crucial for continuous improvement and integration of the system.

Publisher

For publishers, the long-term viability is contingent on the sustained demand for the bundled products. While the initial market response may be positive, publishers must continuously innovate and adapt to changing educational trends and technological advancements. There is also the risk of increased production costs for the sticker packs and bundled products, which could impact profitability. Maintaining strong relationships with educational institutions and authors is crucial for ongoing success.

Bookstore

Bookstores' viability in this initiative relies on their ability to consistently attract and retain student customers. Offering the bundled products at discounted prices is beneficial, but bookstores must also manage their margins carefully to ensure profitability.

Chapter 9
Final Concept & Prototype

The final concept, MileGrow, was developed based on the insights gained from the earlier phases. This chapter explains and demonstrates the key features of MileGrow in detail.

Highlights of MileGrow

MileGrow is an innovative tool designed to elevate the motivation and perceived value of design book reading for novice designers. It integrates physical milestones with a digital design growth map to create an engaging and thought-provoking journey. Here are its key features:

1. **Physical milestones:** Milestones break the lengthy book into smaller, more manageable parts, enhancing the reader's sense of control. Furthermore, allowing readers to personally place milestones within the book's context helps them anticipate key points, mentally prepare for upcoming content, and create a roadmap for their progress through the book.

2. **Reflective questions:** As readers progress through a book, they encounter milestones with reflective questions. These questions stimulate thoughtful reflection, making the reading experience more engaging and thought-provoking.

3. **Noting down thoughts and reflections:** This process can help readers deepen their understanding and digest the content more effectively, thereby maximizing the utility value of the book.

4. **Design Growth Map:** Written reflections can be saved to the Design Growth Map, enabling users to track their progress and intellectual growth across various design fields. Additionally, it assists in organizing thoughts and insights, making it easier to revisit and apply them in the future.

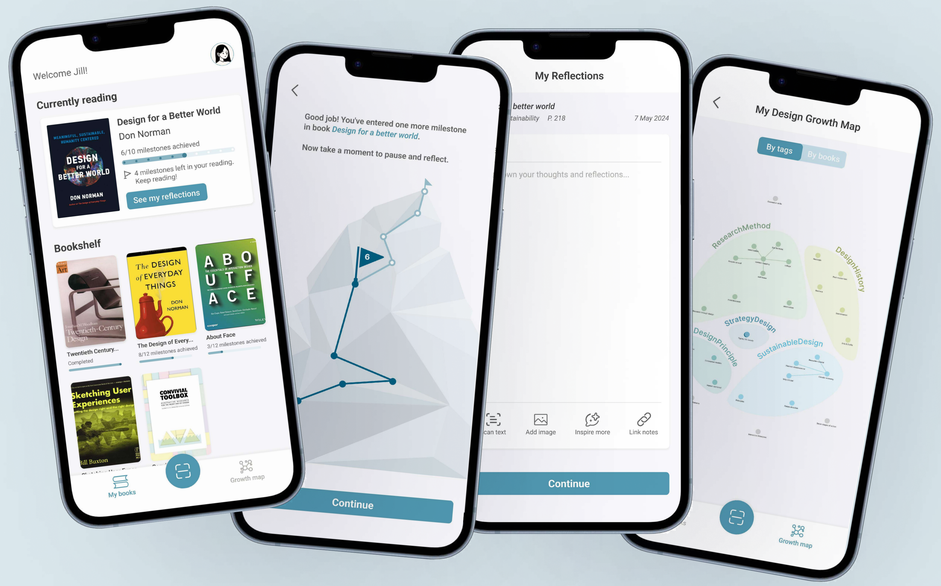


Figure 63. Place milestones inside the book

Reading Preparation

Place milestones inside the book

The reader can get the bundle from the bookshop, including the book itself and a set of milestone stickers. In the pocket, there is a detailed guide of how to use this tool, and the user can follow the instruction step by step to get familiar with it.

For reading preparation, firstly the reader needs to place the milestone stickers inside the book, based on the chapter and page number on each milestone. Through this interaction, the reader can dissect the book into manageable sections, helping them anticipate key moments and mentally prepare for the content they are about to explore.

For practical reasons, including an extra set of milestone stickers offers more flexibility compared to having milestones pre-set by the publisher within the book's pages. This approach ensures that the integrity of already published books remains unaffected while granting users more freedom to use the stickers as they see fit.

During reading

Reach a milestone and time to reflect!

Reflective questions on milestones

When reaching a new milestone, there is always a reflective question on it. The question was generated by the author or the professor, and it serves as an inspiration.

Use the 'scan' function in the app

Readers can open the app and tap the 'scan' button at the bottom of the home page.

Indicate where you are in the book

Upon scanning the QR code, the system will automatically recognize the milestone readers has reached and provide them with positive feedback.

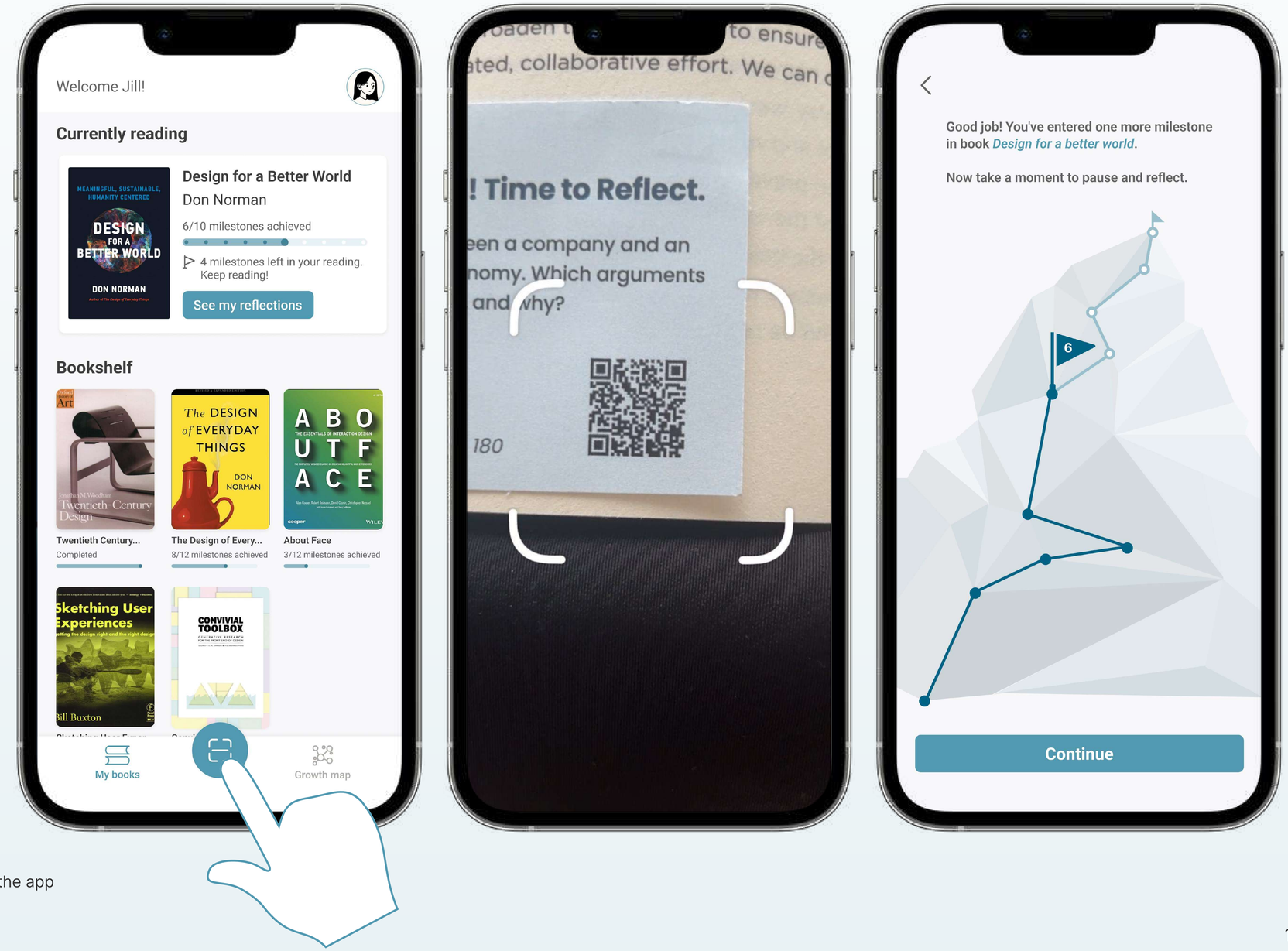


Figure 64. Reach a milestone with a reflective question & Scan it with the app

During reading

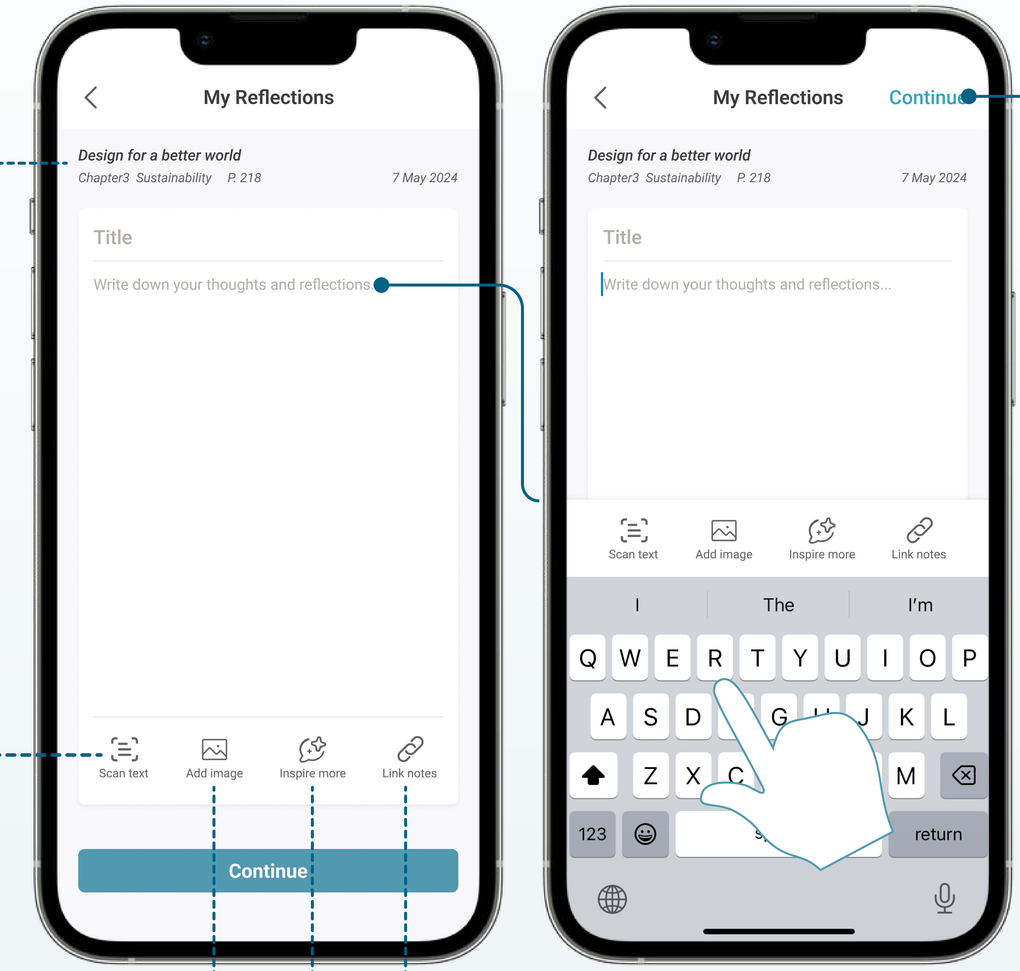
Record your reflections & thoughts

Automatically fill in chapter number & date

Readers don't need to record chapter number and date by themselves.

Scan handwriting into digital notes

To accommodate those who prefer handwriting, this feature can convert handwritten notes into a digital format.



Add image

If readers want to add some visualizations such as photos and drawings, they can use this feature.

Inspire more

If readers find the reflective question on the milestone is not inspirational enough, they can ask AI for alternative questions.

Link notes

Finding this note related to a previous one, readers can use this feature to link the two notes together.

Tag this note (optional)

"When assigning a tag, readers can consider which design field or skill the note relates to. If they're unsure, they can leave it blank and revisit it later when they have a clearer idea.

Previously used tags will be displayed below, making it easier to select an existing tag if desired.

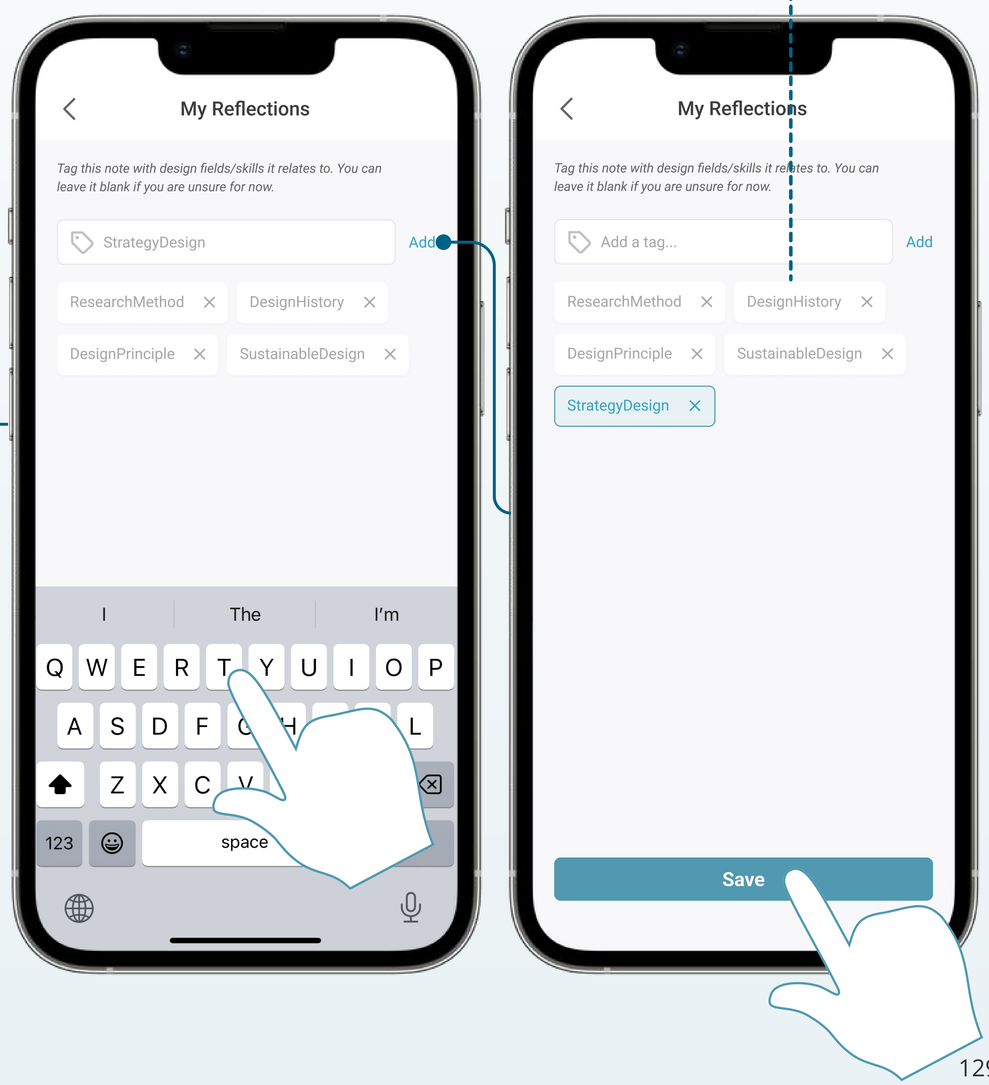


Figure 65. Record the reflections and thoughts using the app

During Reading

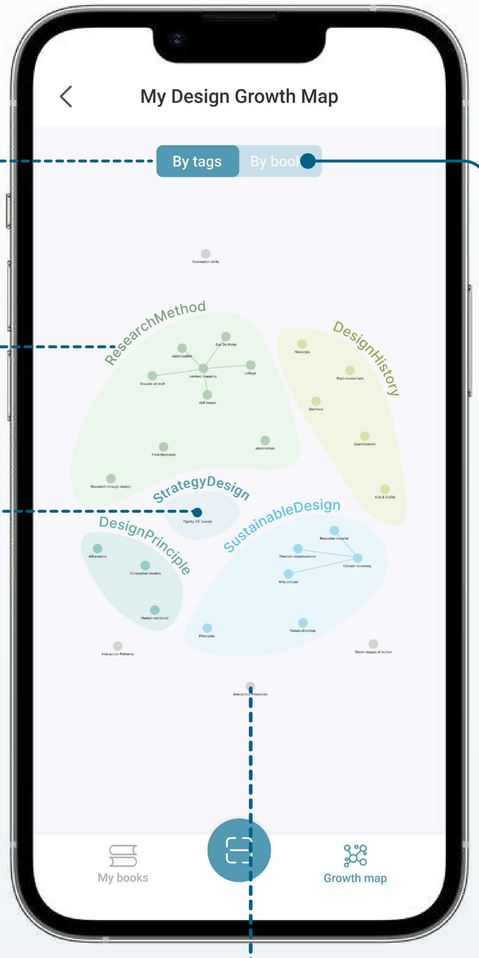
Save your reflections to the Design Growth Map

Two modes: cluster by tags or by books

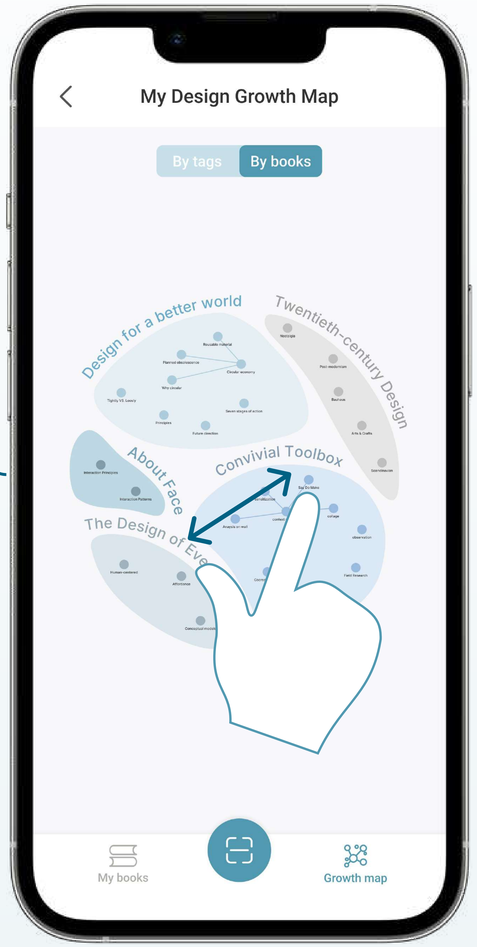
Readers can use this tab to switch between different clustering modes

The assigned tag will be the name of the field

The new saved note will blink for seconds

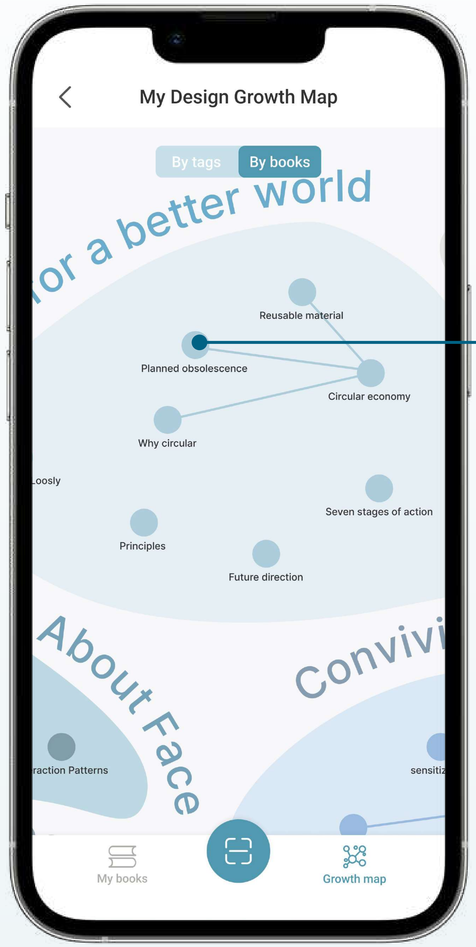


Notes without tags will float outside



Use different gestures to interact with the map

The map can be zoomed in, zoomed out, moved around and rotated.



Revisit the specific note by clicking it

Readers can zoom in and choose the note they want to review.

After Reading

Revisit & organize notes

Edit the note

Readers can revisit and edit their notes, establish connections between related notes by adding links, and assign tags to notes that were previously left undefined.

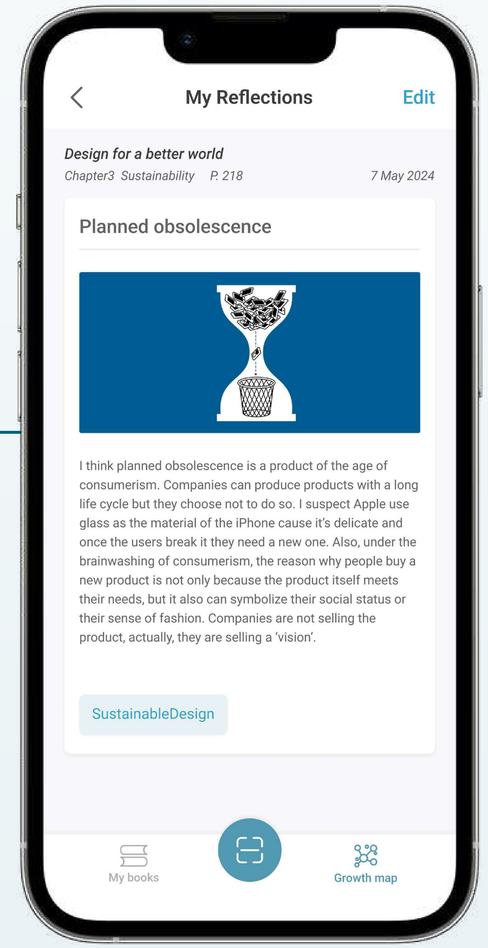


Figure 66. Save the reflections to the Design Growth Map

Find the original reflective question uninspirational?

Use ‘Inspire more’ feature to generate alternative questions

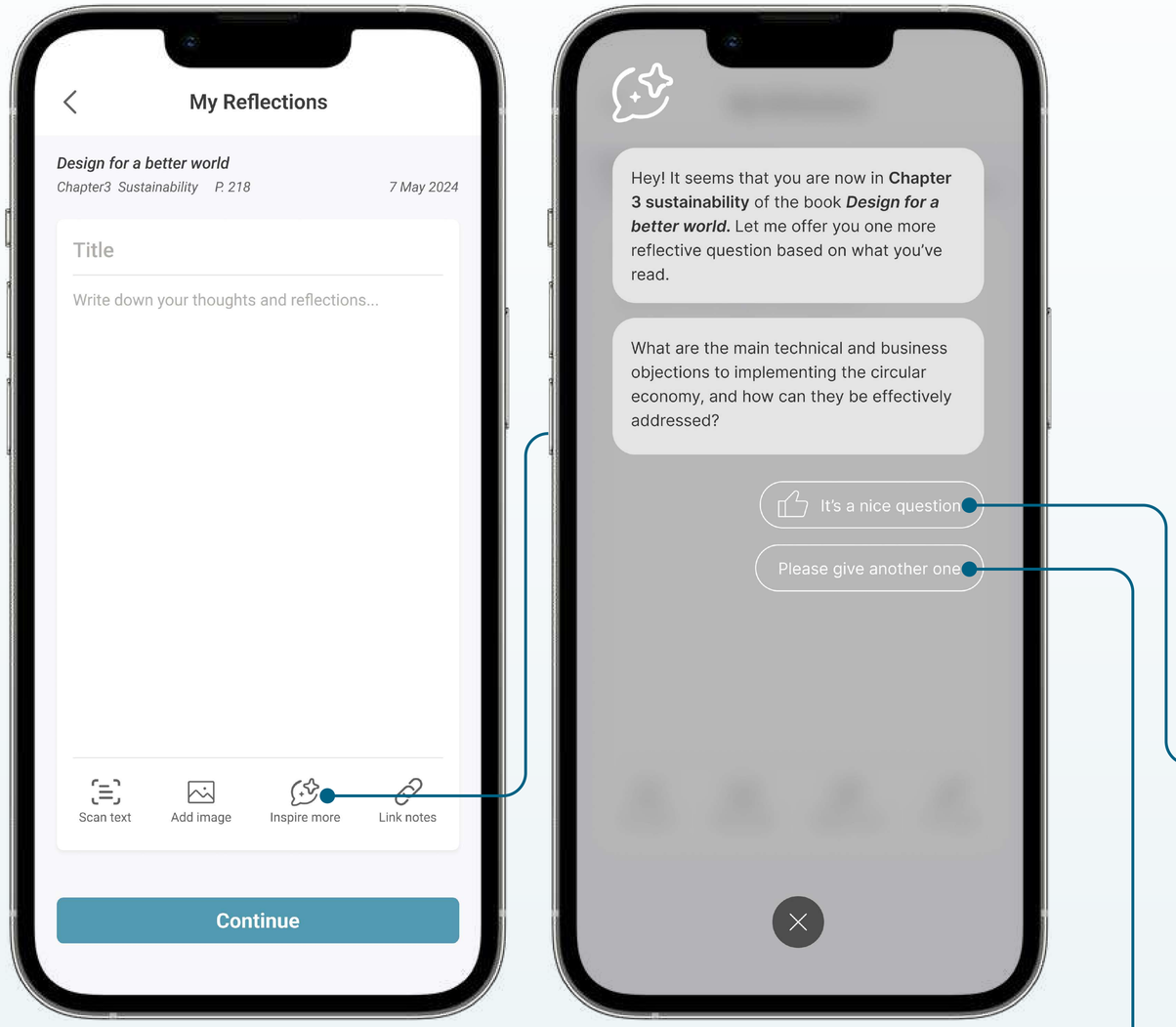


Figure 67. ‘Inspire more’ function

AI generate reflective questions

To reduce choice overload, AI will provide only one alternative reflective question at a time. Since this feature serves as a supplement rather than the main focus of the user flow, the interaction with AI was designed to be as simple as possible.

Readers’ feedback will be used to train the model

Readers' feedback on the questions will be collected and used as training data to improve the AI model. This feedback loop allows the AI to learn from user preferences and continuously refine the quality of the reflective questions it generates.

Homepage

Display books and progress

The most recently scanned book will be displayed in the 'Currently Reading' section. It will also show the reading progress, including the number of milestones achieved and the number remaining.

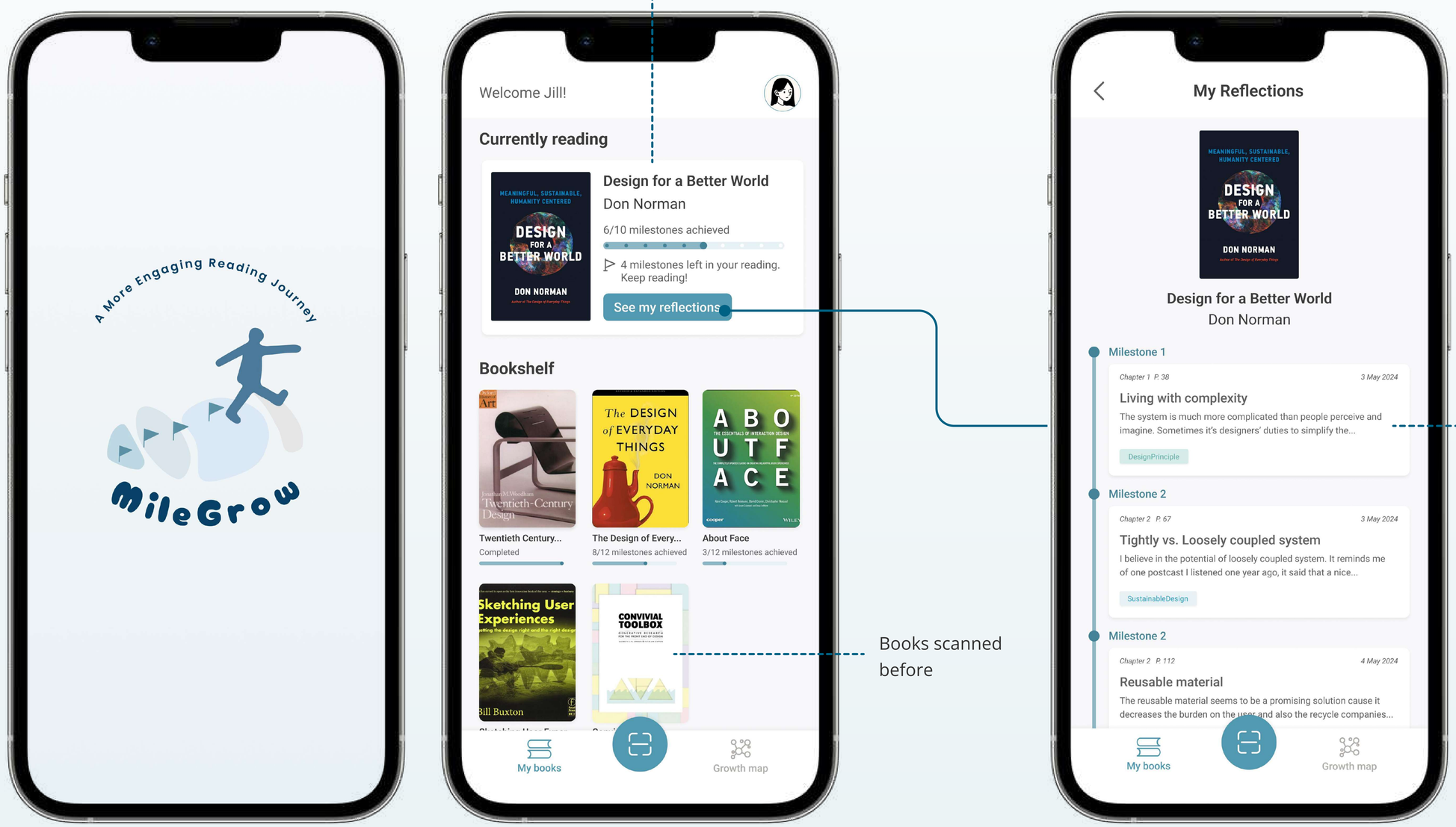


Figure 68. Home page: Display books and progress

Chapter 10
Evaluation & Recommendations

This chapter presents the evaluations of this project along with further recommendations. The evaluations are conducted on two levels: the first assesses the design goal through role-playing, while the second evaluates the overall trajectory of the project. Following these evaluations, limitations and recommendations for future design are discussed. Finally. the chapter concludes with a brief personal reflection on this master's graduation project.

Final Design and Validation

Chapter Overview

10.1 Final Evaluation

For the final evaluation, I chose to use a role-playing approach, where participants and I assumed the roles of novice designers and professors in a real-world context to experience the entire interaction process I designed. I opted not to conduct a traditional user test for two main reasons: first, reading is a long-term activity, and short-duration tests in a controlled environment cannot accurately reflect the true state of novice designers' reading habits.

Second, in the previous three iteration cycles, I tested many features and made numerous small design decisions based on the results, constantly adjusting the design direction. However, there was not enough comprehensive evaluation of the overall trajectory. Therefore, in this final evaluation, I aim not only to assess the design goals but also to re-examine the connection between the project's starting point and the design direction: Is increasing engagement and perceived value in reading a right decision to motivate users to continue reading?

10.1.1 Role-playing

Me as a professor

I assumed the role of the professor, generating reflective questions for the milestones with the assistance of ChatGPT. In this role, I assigned a book-reading requirement to the participant and placed a bundle containing the book and toolkit in Rotterdam Central Library.

Participant as a novice designer

As a novice designer, the participant followed my instructions to retrieve the bundle from the library and took it home to read. The bundle includes the book *Design for a Real World and* a set of milestone stickers, and the high fidelity working prototype of the app.

Figure 69. Role-playing in the real context

10.1.2 Evaluation of the Design Goal

Based on the feedback from the role-playing, overall I think the design goal **“making the experience more engaging and thought-provoking, fostering a sense of knowledge building and self-growth”** was successully achieved. Milegrow was described as a meaningful tool. While it may not make the content itself more interesting, it significantly fosters a sense of personal growth and contributes to increased motivation to read.

Engaging

I really like how the participant described this interaction using the term **'ritual'**. Both the initial interaction of placing milestones in the book and later collecting them one by one into their Design Growth Map added a **sense of ritual** and made the experience more **engaging**.

However, this ritualistic approach might also feel **cumbersome** for some readers. For instance, the participant of the role-playing noted that the landing page after scanning a QR code lacked a 'reflect later' option which should be equivalent to the 'continue' button. This made her feel compelled to reflect and complete the collection process at that moment.

Figure 70. Lack a 'reflect later' option

Thought-provoking

The reflective questions on milestones can effectively **stimulate thoughts**. These questions not only provoke more **critical thinking** about the author's statements, but they may also encourage readers to **connect** the material to their own experiences and observations.

On the other hand, excessive thinking can lead to **fatigue** and **overload**. The 'inspire more' feature could contribute to this feeling, especially if readers are continuously dissatisfied with the questions and keep requesting new ones from the AI.

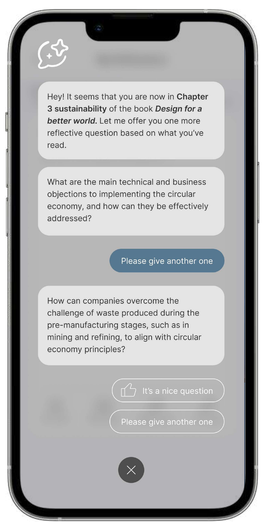


Figure 71. ‘Inspire more’ feature

Knowledge building

Incorporating milestones can help foster structured knowledge-building during the reading experience. Writing down reflections based on prompts **deepens their understanding** and retention of the material, while helping connect ideas and **contextualize new information** within their existing knowledge framework.

However, this structured approach may not align with all readers' preferences for knowledge-building. For example, the participant feel a little bit **constrained** by the set structure. Moreover, the system's focus on reflection at specific points might **not accommodate the dynamic nature of learning**, where insights can emerge unpredictably throughout the reading process.

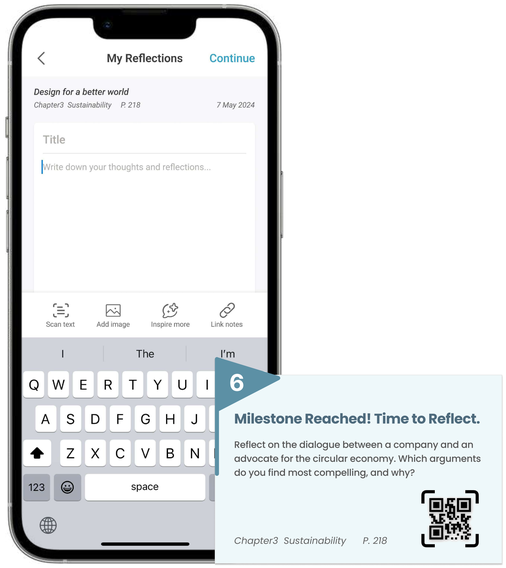


Figure 72. Record reflections based on prompts

Self-growth

Through tagging the reflections with specific design fields or skills, readers can **track their development** in “Design Growth Map’ over time, identifying patterns and areas where they have grown or need further exploration.

However, novice designers may find it **challenging** to come up with appropriate tags for their reflections. The participant mentioned that she hopes AI could assist here by generating tags based on an analysis of the reflection's content.

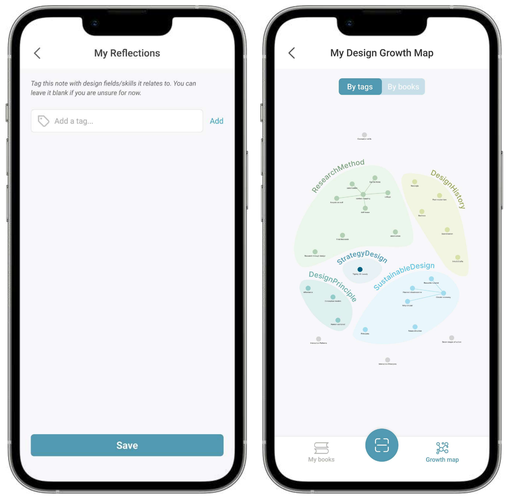


Figure 73. Come up with a tag and save the reflections to Design Growth Map

10.1.3 Evaluation of the overall trajectory

Connection from starting point to final design direction

The initial starting point of the project is to make novice designers more motivated to read design-related books. Through continuous research and tests, the design direction was progressively moving towards making reading more engaging and meaningful to the reader.

The goal of enhancing engagement is to reduce boredness, while fostering a sense of growth aims to help novice designers perceive the value and meaning of reading. These elements can significantly contribute to increasing motivation to read.

However, it must be acknowledged that a major factor influencing reading motivation is the content of the design book itself. If the content is too dull or lacks utility value for the reader, the designed intervention may struggle to effectively motivate reading. This is because the final design is more of an additional aid rather than altering the book's content.

Then why I designed an additional tool rather than alter the content? This design decision is based on considerations of the nature of design books and feasibility. Many novice designers perceive design books primarily as tools for acquiring knowledge, so making the content more entertaining is not what they seek.

In terms of feasibility, altering the book's content—whether its structure or the text itself—would require consultation and discussion with the author and cooperation from the publisher, which involves significant implementation costs. In contrast, the current design is more flexible and can be applied to a broader range of books.

Overall, is increasing engagement and perceived value in reading through an additional tool the right design direction to motivate users to continue reading? I would say yes. However, the final design is just one example of how to motivate novice designers to continue reading. There are still many potential approaches to address this issue differently.

10.2 Limitations & Recommendations

The limitations of this project are outlined in this section, along with suggestions for future research and further development of the concept.

Enhancing flexibility of the system

The Milestone with Reflective Questions feature provides a more structured approach to reading and reflection, which may not suit some people's preferences. Previous research has shown that some designers do not follow a linear reading pattern when engaging with design books which serve more as tools than traditional narratives. These designers tend to have a more dynamic and personalized reading order, guided by their immediate needs and interests. For such individuals, the current design may not fully resonate with their reading habits.

Furthermore, some people approach learning and knowledge accumulation in a fluid and organic manner, with inspiration and ideas emerging spontaneously. These individuals may prefer a more flexible approach to note-taking, one that allows them to capture thoughts and insights as they occur, rather than adhering to a predefined structure. The current design's lack of flexibility in this regard is a notable limitation.

To better accommodate diverse reading and thinking styles, future iterations of the design could consider several enhancements.

One possibility is to provide an option to toggle between linear and non-linear navigation, helping users who prefer to explore content in a non-sequential manner. This might include features like a visual map of the content that users can navigate freely, or bookmarks that allow them to jump between sections without losing context.

In conclusion, while the Milestone with Reflective Questions feature offers a valuable structure for reflection, enhancing its flexibility and personalization could make it more accessible and engaging for a wider range of users.

More potential of AI engagement

In the current design, AI functions more as a supplementary tool, helping users generate additional reflective questions when needed, rather than being part of the primary interaction flow. However, based on the evaluation, I believe AI has greater potential for development. For instance, one possible application could be assisting novice designers in tagging their reflections when they are unsure of what tags to use. AI might suggest relevant tags based on the content of their reflections. Another potential direction is guiding users step-by-step through breaking down and analyzing reflective questions, starting with simpler prompts and gradually leading to deeper reflection.

However, it is important to note that while AI can be powerful, it should not draw too much attention or replace human thinking. Its limitations must also be acknowledged. AI may struggle to fully understand the nuances or context of a user's reflections, potentially leading to suggestions or questions that are irrelevant or off-target. Additionally, there is a risk that users might become overly reliant on AI for generating questions or making decisions, which could impede their ability to think critically and independently. In conclusion, while AI offers considerable potential for development, its application requires careful and thoughtful consideration.

Collaborative Reading Community

The current design is primarily tailored for individual reading experiences. However, considering its potential application in a classroom setting, there is an opportunity to explore the creation of a collaborative reading community where students can interact and exchange ideas.

In this community, students who have already completed the book could set milestones and reflective questions for their peers, providing a guided experience for those who read afterward. This peer-driven approach could not only deepen understanding but also foster a sense of connection and shared learning.

Additionally, students could contribute their own reflective questions to a communal pool, where others can browse for inspiration. This would be particularly useful when readers find the preset questions less stimulating or relevant.

10.3 Personal Reflection

My graduation project turned out to be much more complex and challenging than I initially expected. In the past, many of my projects focused on experimental designs and future technologies, so I wasn't very experienced in considering market viability and feasibility. However, since my graduation project dealt with a practical topic and didn't rely on advanced technology, I realized that it was crucial to think about how the design could be implemented in the real world. I'm glad I took the time to carefully consider these aspects, envisioning how different stakeholders might collaborate and engaging in conversations with the founder of Immer. This experience was valuable for my future design career in a company setting.

I've also grown in how I approach design methodology. One of the biggest challenges of the graduation project was navigating the wide range of design methods available. In previous design courses, we were often guided by specific design methods, and I simply followed those guidelines. However, this project felt like stepping into an open field where I had to choose the methods that best suited my project and make sure they were used meaningfully. The 'Learning by Doing' approach I took was valuable not just for the final outcome but also for the insights I gained along the way. That said, during the process of ‘Learning by Doing’, I also discovered my limitations. I found it difficult to balance listening to user feedback with trusting my own judgment. I tend to be easily influenced by others' opinions and feedback, but I've realized that trying to please everyone is neither possible nor practical. Moving forward, I hope to be more confident in standing by my decisions.

As I reached the end of this project, I remembered something a former mentor once told me: 'Never overestimate the power of design or think it is all-encompassing.' This advice has resonated with me more deeply as I've progressed in my design journey. My design may not turn non-readers into avid fans of design books overnight, but if it can provide even a small boost in motivation to keep reading, I will consider that a success.

Finally, I'd like to conclude with a line from Dylan Thomas that serves as both a reminder and personal encouragement for the future: '*Do not go gentle into that good night*.'

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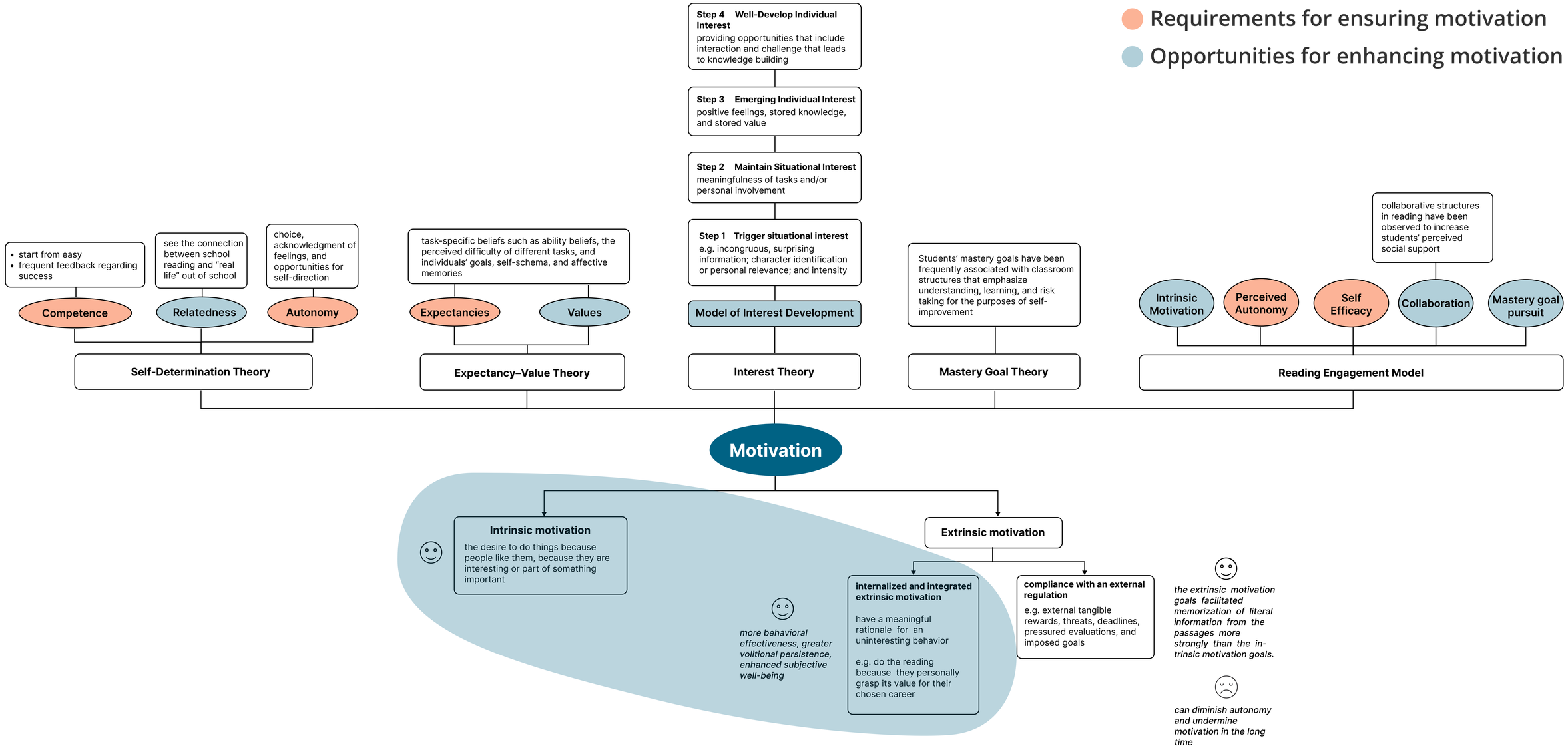
Appendix

Appendix A

Infographic on Reading Motivation Literature Review

This infographic visualizes the classification of motivation and the relationships among various reading motivation theories. The sections highlighted in orange represent the essential requirements for sustaining motivation, while the blue sections indicate opportunities for enhancing it.

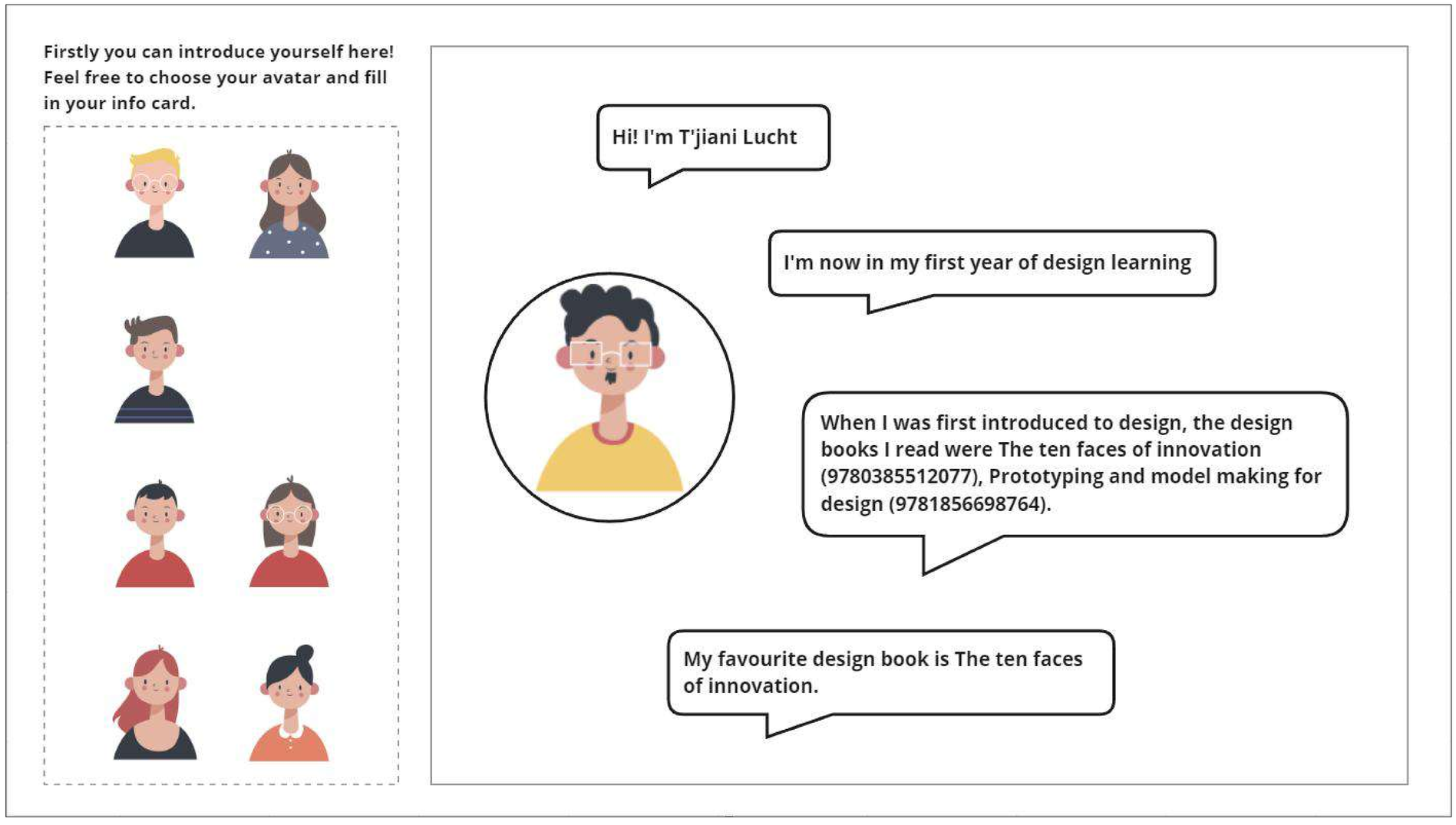


Appendix B

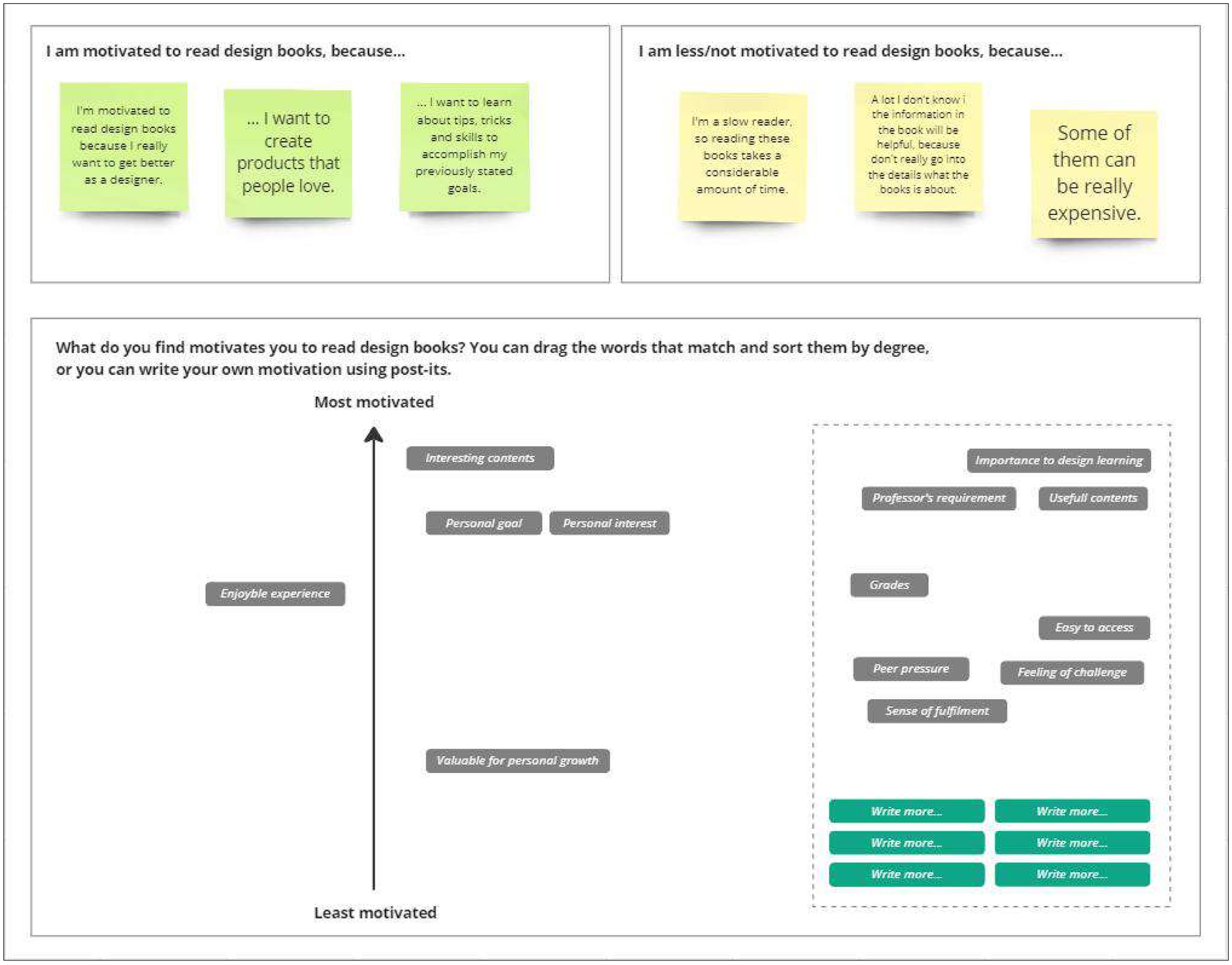
Sensitizing Excercise for Context Mapping

The sensitizing exercise consists of two main parts, 'This is me!' and 'This is why I read!'. Firstly participants were asked to introduce themselves and the design books they read before, then to list the reasons why they are motivated to read and why they are not motivated to read, and finally to select and sort the motivational factors by degree. The results of the exercise were discussed with the participants during the generative sessions.

Part 1: This is Me!



Part 2: This is Why I Read

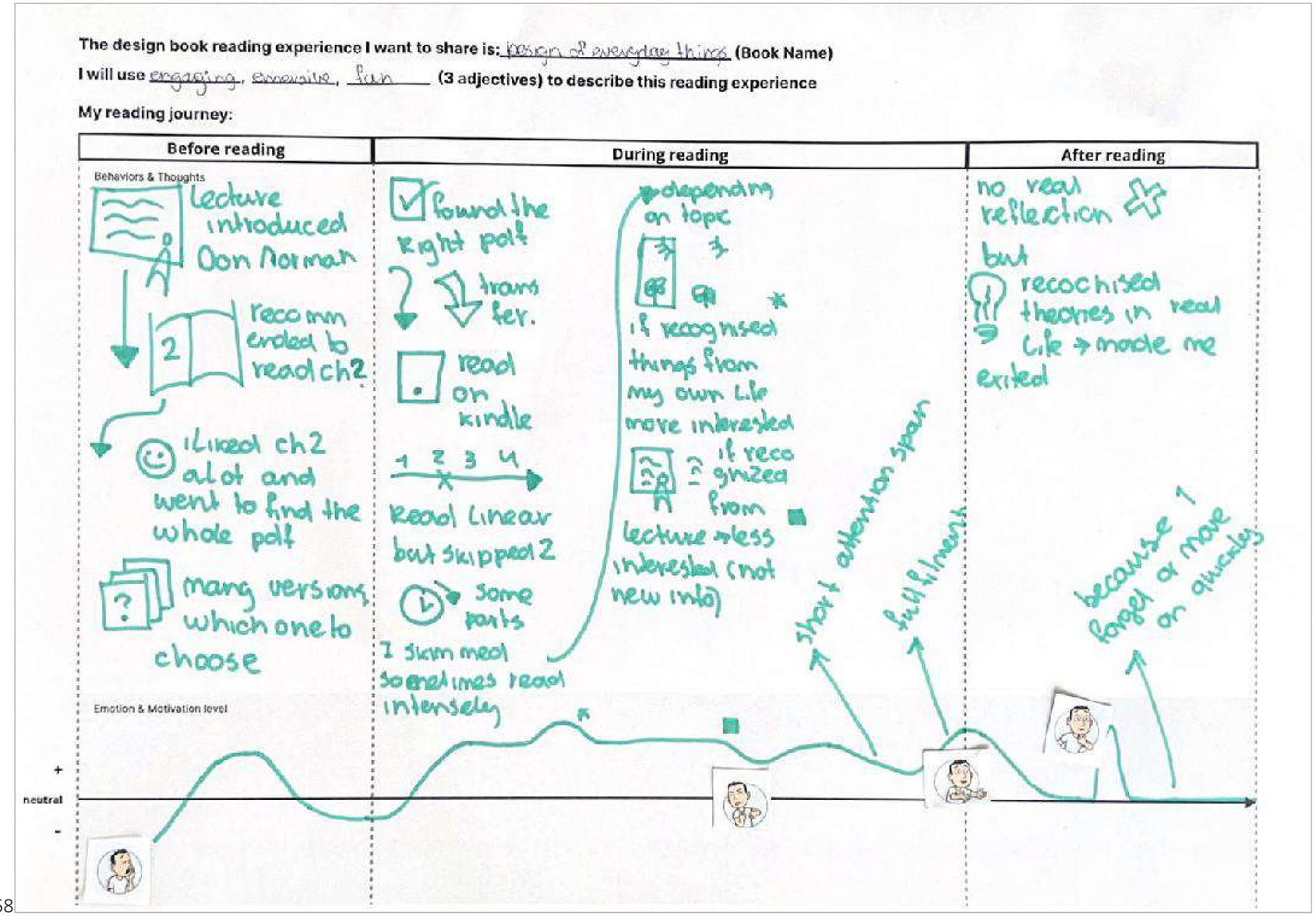


Appendix C

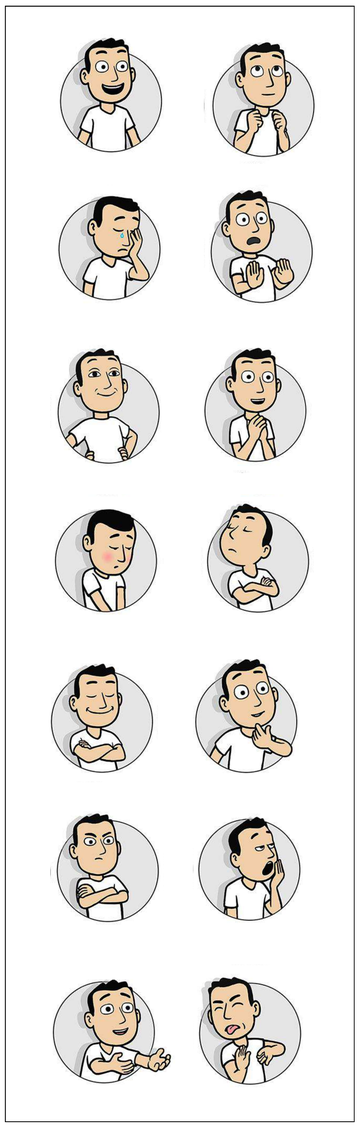
Generative Session Materials for Context Mapping

The sessions were conducted offline. During the sessions, participants were firstly encouraged to tell the story of their past or current reading journey, focusing on the design book they brought with them. Premo tool was provided to help them express their emotions. After telling the story of their past reading experience, they were asked to create a collage representing their ideal design book reading experience using the tools prepared on Miro.

Part 1: Tell the story of past/current reading journey



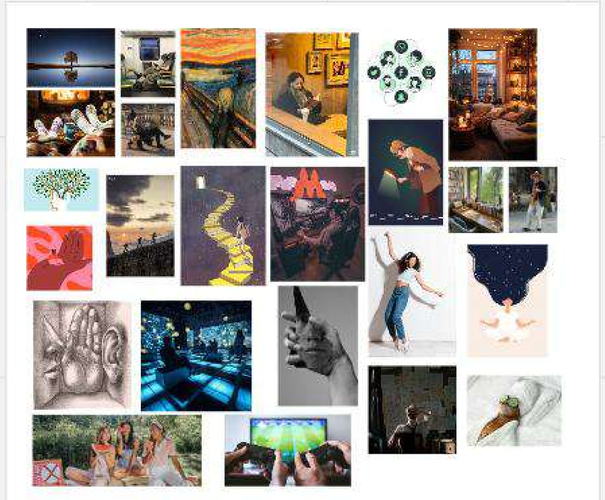
Premo Tool for mapping emotions



Part 2: Collage——My ideal reading journey

Frame 10

Frame 11



Appendix D

Context Mapping Results Visualized in a Reading Journey Map

The results of context mapping research are visualized in a comprehensive reading journey map, including behavior patterns, motivators, dismotivators and emotions.

Before reading	During reading	After reading

Behavior Patterns

Read book reviews before choosing the book

"Sometimes I read book reviews before deciding which book to read, and bad reviews could turn me off."

— Participant 4

"Good reviews left by people similar to me will give me the motivation to read this book. For example, if someone who also loves mechanics leaves a review saying that the book is worth reading, then I would definitely want to read it."

— Participant 6

Flip through the book firstly

"Before reading the whole book, I used to flick through it to see if there was anything interesting"

— Participant 6

Linear reading is not necessary for design book reading

*"Convival Toolbox is more like a tool rather than a fiction. Different audience may **start the book from different sections**. Design students may start from theories because they want some theory base, when practitioners may draw biggest value from the case study part."*

— PJ Stappers

*"In the beginning, I read the chapters in the order of chapter one, chapter two, and chapter three... But one day after, I just **flip through the book**. Only when I **found something interesting** I would dive into the contents."*

— Participant 3

*"When I read I'll firstly **scan the table of contents** to see if there's something interesting, then **jump to the interesting stuff first**. After that I'll read linearly from the beginning."*

— Participant 7

*"I use it as a tool. I'll **look for related chapters** to read just to find answers when I **need some guidance** on my project."*

— Participant 1

Share interesting insights with others

*"The first chapter in the book mentions a lot about stuff that was really applicable and recognized in real life. I really **enjoying sharing these real life findings with my family members**."*

— Participant 2

Make notes/Leave marks

"I won't leave any marks in the book, but I will use a separate notebook to write down the more important stuff and insights."

— Participant 3

"I want to make notes because the vital information will get lost easily otherwise."

— Participant 4

"While reading I always put post-its inside on interesting pages so I know where to go back"

— Participant 5

"Sometimes I take notes of my ideas on the phone. I don't take notes from book itself, but I took notes of what I thought."

— Participant 6

"I used to make annotations and highlight sth important in my books."

— Participant 7

Do some self reflection

*"I often reflect on **what I have done in the past** and **what I can do in the future** to improve myself as a designer."*

— Participant 4

Look up unfamiliar terminology from other resources

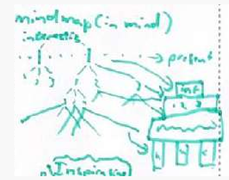
"About 'affordance' I wasn't sure what it meant at first, so I went to Google it to find its definition."

— Participant 8

Make a mindmap

"After reading, I will put all interesting things I remember in mind together and make a mindmap. Everytime I need to ideate sth, I will drag inspirations from my mindmap and make associations between different stuffs to form ideas."

— Participant 6



Sort out important info

"After I finish reading, I like to sort out all important and useful info on my laptop."

— Participant 7

Search for more info about the author

"After reading the book I googled for more information about the author. I also followed his linkedin."

— Participant 8

Share insights with friends

"After reading it I shared some interesting insights with my friends in the group chat."

— Participant 8

Motivators, Dismotivators & Emotions

neutral

Good reputation & Recommendations from others

"It's in the list of the top 5 design books"

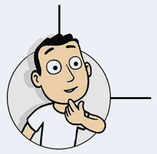
Participant 2

"In my first year, my professor recommended me to read this book and said it's really nice."

Participant 3 & 7 & 8

*"I know the book from the Podcast about hardware and manufacturing. The main host recommend this book so I **became curious about this book**."*

Participant 4



Symbol of identity

*" Sometimes I think the books I read can symbolise who I am as a person. For example, one of the big reasons I read the Delft Design Guide was because I was coming to TUD soon at that time, and I felt like the **book was kind of a symbol of TUD's identity**"*

Participant 1

Nice visuals as a hook/supplement

*"I always use **more visualizations** such as pictures, photos and diagrams in each chapter to **hook attention**, and then the reader can **grab the main meaning through those pictures and titles** when scanning the book."*

PJ Stappers

*"I enjoy watching **videos about design** because they are much more **easier to understand** and to share insights with friends"*

Participant 3

"I was interested in steam engines and mechanisms, and the pictures really grab my attention and inspire me"

Participant 6

"I saw a video about Norman's door and the gorilla. That was really funny and sparked my interest in the book."

Participant 8

Perceived usefulness & Practical relevance

*"Students feel most motivated when they **need to learn and apply theory** to their own design projects **immediately**."*

PJ Stappers

*"The strategy I used before is to **create the opportunity** for students to **create stuff based on what they learnt** from design literature."*

PJ Stappers

*" I get the urge to read when **I need to find answers** in a book"*

Participant 1

*" When I feel the book could offer me some **new insights** or I **encounter some problems** related to creativity, I will come back to the book again"*

Participant 4

"The book help me a lot with finishing the deadline, so I want to read the whole book since it seems to be useful."

Participant 5

*"I recognised the significance of reading design books as a **catalyst for design careers and personal growth**."*

Participant 1

*"Design books can **help better ideation** and I view them as **stepping stones or ladders** to a successful design concept"*

Participant 3

"The peak moment while reading was when I found sth useful to my own project."

Participant 7

"I revisited the book's theories when I encountered something related to its theories in my own design projects."

Participant 8

See the intrinsic relationship between theories and real-life objects

*"The first chapter in the book mentions a lot about stuff that was **really applicable and recognized in real life**. I started **noticing things around me** and I really enjoying sharing these real life findings with my family members."*

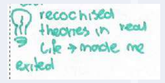
Participant 2

*"The peak moment after reading is when the content I read before was mentioned in the course and I found those theories are **truly applicable in real-life design**"*

Participant 2

*"When I **realised** that some examples or things I also could **encounter in my daily life**, I was extra motivated to read those parts"*

Participant 5



*"At the beginning of the book there were a bunch of **hilarious examples of everyday life** that I found fascinating, so I was quite curious and had a desire to keep reading."*

Participant 8

Sense of ownership & possession

*"The best thing about a physical book is that after reading it I can let it **become part of my collection** on my bookshelf, and reviewing my collection of these makes me **feel satisfied and happy**. But it's hard to get that with the pdf version because often I don't remember what folder I threw it in after reading it."*

Participant 1

*"I prefer physical books more because **e-books get lost easily** in the digital files. I have a book shelf to store my books but I don't have a e-book case."*

Participant 4

*"I tend to forget books in laptop, kindle or e-reader, but if I have books on my shelf I know I have them. I also **enjoy looking at all books I have in my room** and some books have really beautiful covers."*

Participant 5

Uncertainty regarding the contents

"Before reading, I don't know if the information in the book will be helpful, because I don't really go into the details what the books is about. "

Participant 4

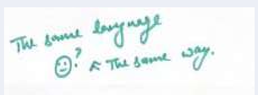
*"If the design book is very thick and **I don't know what I'll get out of it**, I would be less motivated because I don't know what it will bring me "*

Participant 5

Lack of unpredictability and novelty

*" **Every chapter is structured in the same way** and that makes me feel tired and boring. For example, theories are always followed by case studies and examples. "*

Participant 3

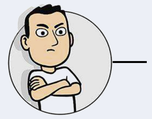


*"Sometimes the design books could be a **bit stuffy** because the writing style and presentation of information lacks freshness and creativity."*

Participant 5

*"There were some chapters that I recognise them from the lecture I have, and I was **less motivated because I need the new information rather than sth I've already known**"*

Participant 5



Complicated and unfamiliar terminology

*"**Terminologies** used in the book are too **complicatedand not familiar** to non-designers and novice designers"*

Participant 2

*"I **didn't have enough personal design experience** when trying to understand the terms in the first year"*

Participant 2

*"Sometimes I don't understand the language because the **language** they use is really really **complex and professional**. I have to read again and again to understand it and the reading becomes more like a task."*

Participant 3

"Some of the dry theories and obscure concepts that followed made me a little boring. For example, about 'affordance' I wasn't sure what it meant at first, so I went to Google it to find its definition.."

Participant 8

*"I set a **glossary** at the end of the book for new comers to deal with the definition of terminology."*

PJ Stappers

Effort outweighs perceived value

*"I can't see the relationship between the contents and my personal design case and there's **no chance** for me to **apply these theories** at that time. "*

Participant 1

*"The book is **not necessary for my uni work**, so I just put it aside for other more urgent and important things. "*

Participant 3

*"Many of my students gave me feedback **years after graduation** that they **realised the value** of this book.."*

PJ Stappers

Appendix E

Cycle 1 Test Materials and Results

Concept 1: Book Bites

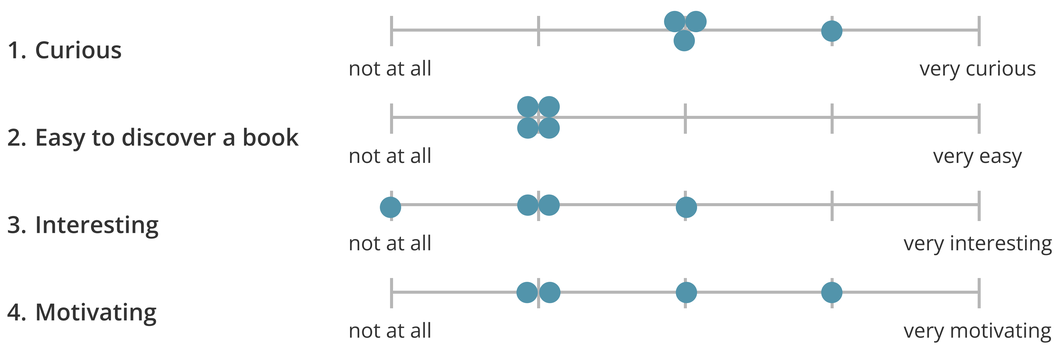
Open-ended Questions:

1. What do you feel about this design book discovery experience?
2. What makes you feel that?
3. What is your usual way of discovering a new book?
4. How do you think this is different compared to your usual way of discovering a new book?

Likert-scale results

After the open-ended questions, participants were asked to rate four specific statements, each representing one of the desired interaction qualities linked to the first design direction. These four qualities were chosen because they align with the ideal reading experiences described by users during the Context Mapping Session. Although abstract, qualities such as 'interesting' or 'motivating' were derived directly from user feedback and reflect the emotional and cognitive responses I aimed to evoke. By asking participants to score these qualities, I could gauge their subjective experiences and how closely the prototypes aligned with the ideal experiences they envisioned.

As for the results, participants rated the concept prototype as low in terms of interest, and they also felt it is not a easy way to discover a new book. The curiosity level is a slightly higher but also not very ideal. Overall, the concept was rated as not very motivated by testers.



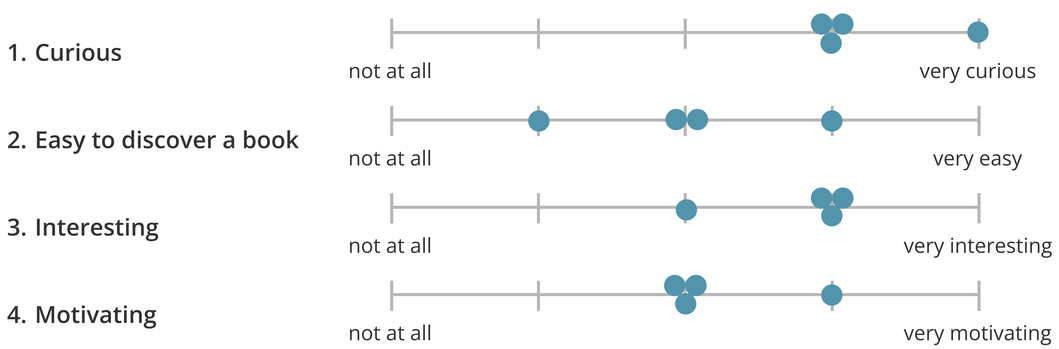
Concept 2: Readers' shares (as the role of browsers)

Open-ended Questions:

1. How does other readers' shares influence your book exploring experience?
2. What do you feel about this design book discovery experience? What makes you feel that?
3. Which form of sharing (e.g. Q&A, exaggerated titles) appeals to you the most? Why?

Likert-scale results

The test results showed that concept 2 did better in triggering curiosity and interest than concept 1. However, most of them were primarily interested in the sharer's insights and interacting with the sharer, rather than feeling motivated to read the book itself.



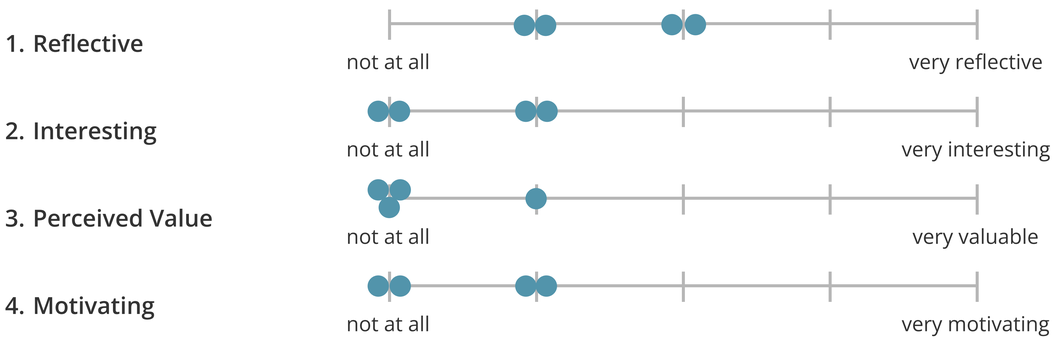
Concept 2: Readers' shares (as the role of sharers)

Open-ended Questions:

1. How do you perceive that reading with the purpose of sharing affects the reading experience?
2. How do you feel about the experience of generating a sharing? What makes you feel that?
3. What kinds of feedback/rewards do you expect to receive after sharing?

Likert-scale results

Another four desired interaction qualities were rated specifically for the role of sharers. When participants assumed this role, most reported more negative feelings than positive ones. They felt that the effort required to share outweighed the personal value they gained. This was partly due to the experiment's setup, where participants were required to complete the sharing task rather than naturally developing a desire to share during the reading process.



Concept 3: Interactive Annotation

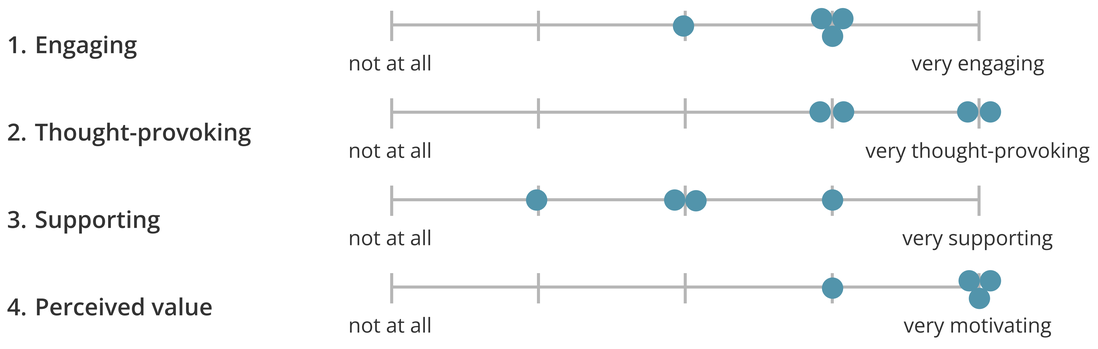
Open-ended Questions:

1. How does adding annotations using the designed tool impact your reading experiences?
2. How do you feel about reading with the annotation tool? What makes you feel that?
3. What expectations do you have for this interactive annotation system?

Likert-scale results

Since Concept 3 aligns with the second design direction, it prioritizes enhancing engagement and fostering mutual support. As a result, 'sense of engagement' and 'support' were selected as key interaction qualities for evaluation. Additionally, 'thought-provoking' and 'perceived value' were included as desired features that resonate with this direction.

Regarding the test results, participants generally rated this concept positively, particularly appreciating its thought-provoking nature and the perceived value it offered.



Concept 4: Collecting Pieces of Reflections

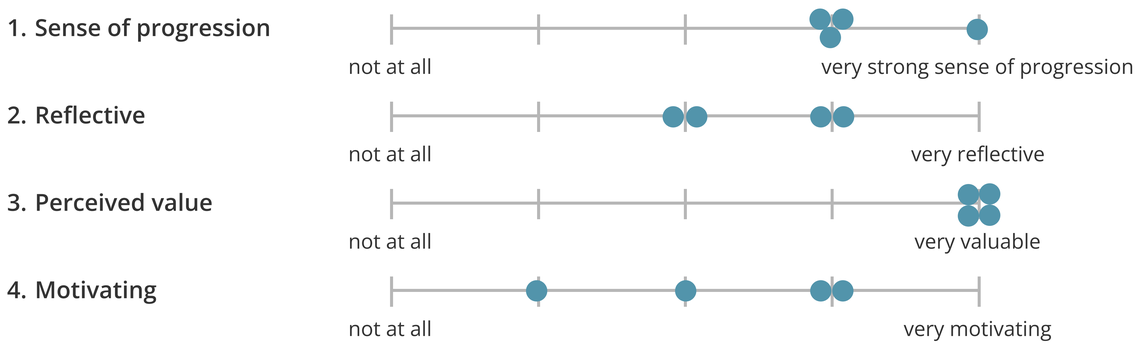
Open-ended Questions:

1. How does writing down reflections of what you have read impact your reading experience?
2. How does collecting fragments of book cover impact your reading motivation?
3. How do you feel about the overall experience? What makes you feel that?
4. Do the reflective questions provided help in generating reflections?

Likert-scale results

The third design direction aims to foster a sense of progression, encourage reflective reading, and enhance the perceived value of reading, all with the goal of strengthening motivation. These four related qualities were therefore selected for evaluation.

Overall, participants responded positively to this concept, particularly noting a strong sense of progression and enhanced perceived value.



Appendix F

Cycle 2 Test Materials and Results

Concept 1: My reading journey

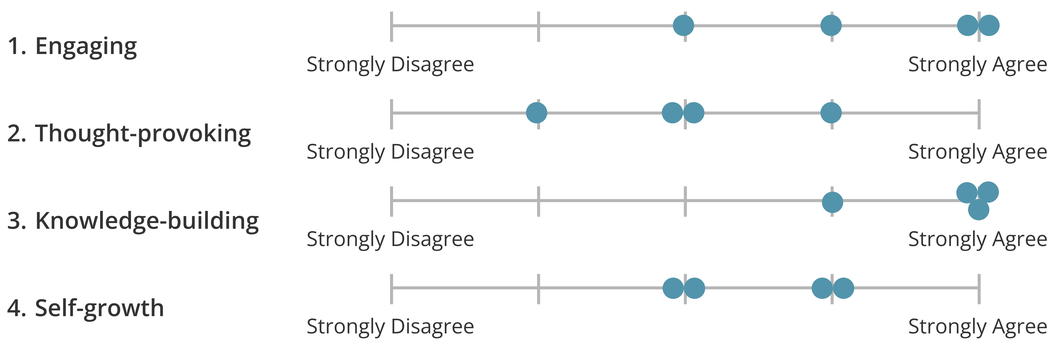
Open-ended Questions:

1. What did you feel about this reading experience in general?
2. What makes you feel that?
3. How did the toolkit impact your book reading experiences?
4. How did you feel about the ‘My reading journey’ part? Did it make you more motivated to read?
5. How did you feel about the ‘reflective questions’ on the cards? Did these help? What kind of questions can evoke your thoughts?
6. What suggestions do you have for improving this tangible toolkit?

Likert-scale results

The four interaction qualities chosen for evaluation—engagement, thought-provoking nature, knowledge-building, and self-growth—directly align with the design goals. Participants rated these qualities on a scale from one to seven, with one indicating 'Strongly Disagree' and seven indicating 'Strongly Agree.'

Overall, this concept works better in creating a sense of engaging and knowledge-building.



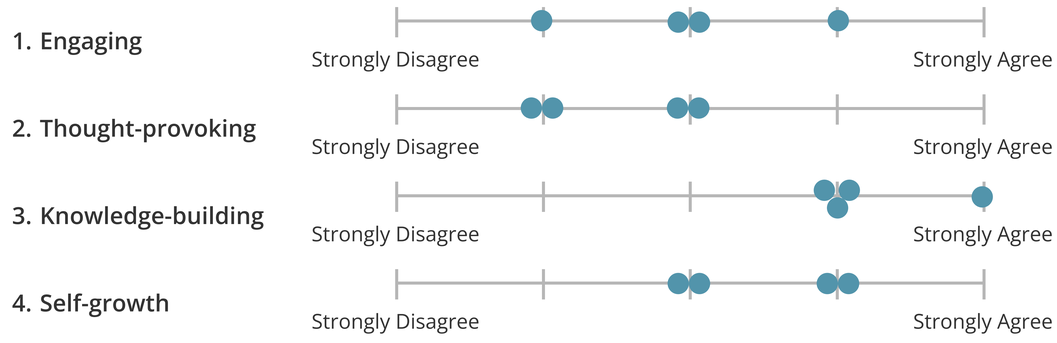
Concept 2: Collecting puzzle pieces

Open-ended Questions:

1. What did you feel about this reading experience in general?
2. What makes you feel that?
3. How did the toolkit impact your book reading experiences?
4. How did you feel about the ‘Puzzle piece’ part? Did it make you more motivated to read?
5. How did you feel about the ‘reflective questions’ on the cards? Did these help? What kind of questions can evoke your thoughts?
6. What suggestions do you have for improving this tangible toolkit?

Likert-scale results

The test results showed that this concept performed slightly better in ‘knowledge-building’ compared to other three.



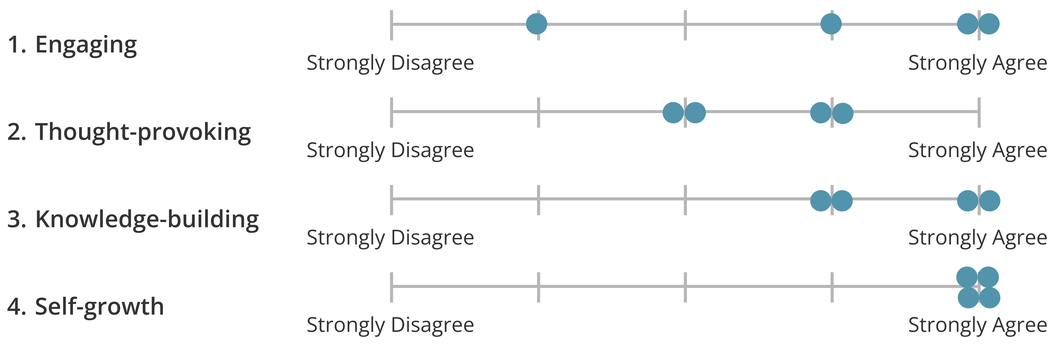
Concept 3: Design growth map

Open-ended Questions:

1. What did you feel about the ‘Design Growth Map‘ feature in general?
2. How did you find the process of selecting and defining your areas of interest in the design growth map? Do you feel this feature adequately reflects your personal learning goals and interests?
3. How did you feel about the process of lighting up points on the growth map as you made progress?
4. Do you have any suggestions for improving the skill tree feature? Were there any additional features you wished the skill tree had?

Likert-scale results

The results showed that this concept excelled particularly in the areas of self-growth and knowledge-building. Many participants noted that the 'Design Growth Map' feature allowed them to see their progress in the design field, which gave them a strong sense of achievement and motivation to continue exploring.



Appendix G

Reflective Questions used in Self-Test

1. What are your opinions on the phenomenon of planned obsolescence in product design? Have you noticed any examples from your own life or surroundings that illustrate this phenomenon?

2. Can you recall the key principles of the circular economy, and do you believe that adopting a circular economy strategy is a viable path towards achieving sustainability?

3. Reflect on the statement that “the best solution is to eliminate most recycling and instead focus on direct reuse of the materials.” Do you agree with this approach? Why or why not?

4. Reflect on the dialogue between a company and an advocate for the circular economy. Which arguments do you find most compelling, and why?

5. Reflect on the differences between tightly and loosely coupled systems. What's your understanding of the advantages and disadvantages of each in design?

6. As a designer, how do you understand the complexity of systems and causality? Can you identify any systems that are particularly challenging to understand or manage?

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IDE Master Graduation Project

Project team, procedural checks and Personal Project Brief

In this document the agreements made between student and supervisory team about the student's IDE Master Graduation Project are set out. This document may also include involvement of an external client, however does not cover any legal matters student and client (might) agree upon. Next to that, this document facilitates the required procedural checks:

- Student defines the team, what the student is going to do/deliver and how that will come about
- Chair of the supervisory team signs, to formally approve the project's setup / Project brief
- SSC E&SA (Shared Service Centre, Education & Student Affairs) report on the student's registration and study progress
- IDE's Board of Examiners confirms the proposed supervisory team on their eligibility, and whether the student is allowed to start the Graduation Project

STUDENT DATA & MASTER PROGRAMME

Complete all fields and indicate which master(s) you are in

Family name	Zhao	7124	
Initials	ZJY		
Given name	Jingyi		
Student number	5804353		

IDE master(s) IPD ☐ DfI ✔ SPD ☐

2nd non-IDE master

Individual programme *(date of approval)*

Medisign ☐

HPM ☐

SUPERVISORY TEAM

Fill in he required information of supervisory team members. If applicable, company mentor is added as 2nd mentor

Chair	Jeff Love	dept./section	SDE/HCAI
mentor	Ianus Keller	dept./section	HCD/DCC
2nd mentor			
client:			
city:		country:	
optional comments			

! Ensure a heterogeneous team. In case you wish to include team members from the same section, explain why.

! Chair should request the IDE Board of Examiners for approval when a non-IDE mentor is proposed. Include CV and motivation letter.

! 2nd mentor only applies when a client is involved.

APPROVAL OF CHAIR on PROJECT PROPOSAL / PROJECT BRIEF -> to be filled in **by the Chair** of the supervisory team

Sign for approval (Chair)

Digitally signed by Jeff Love
Date: 2024.03.28 15:37:23 +01'00'

Name J.S. Love Date 28 feb 2024 Signature

CHECK ON STUDY PROGRESS

To be filled in **by SSC E&SA** (Shared Service Centre, Education & Student Affairs), after approval of the project brief by the chair. The study progress will be checked for a 2nd time just before the green light meeting.

Master electives no. of EC accumulated in total _____ EC

Of which, taking conditional requirements into account, can be part of the exam programme _____ EC

★	**YES**	all 1st year master courses passed
☐	**NO**	missing 1st year courses

Comments:

Sign for approval (SSC E&SA)

Robin den Braber
Digitaal ondertekend door Robin den Braber
Datum: 2024.04.11 10:19:34 +02'00'

Name Robin den Braber Date 11 apr 2024 Signature

APPROVAL OF BOARD OF EXAMINERS IDE on SUPERVISORY TEAM -> to be checked and filled in by IDE's Board of Examiners

Does the composition of the Supervisory Team comply with regulations?

YES	★	Supervisory Team approved
NO	☐	Supervisory Team not approved

Comments: Chair: Ianus Keller, Mentor: Jeff Love

Based on study progress, students is ...

★	**ALLOWED** to start the graduation project
☐	**NOT** allowed to start the graduation project

Comments:

Sign for approval (BoEx)

Monique von Morgen
Digitally signed by Monique von Morgen
Date: 2024.04.11 11:04:03 +02'00'

Name Monique von Morgen Date 11 Apr 2024 Signature

Personal Project Brief – IDE Master Graduation Project

Name student Jingyi Zhao **Student number** 5,804,353

PROJECT TITLE, INTRODUCTION, PROBLEM DEFINITION and ASSIGNMENT

Complete all fields, keep information clear, specific and concise

Project title Empowering Reading: Boost Novice Designers' Motivation for Design Books

Please state the title of your graduation project (above). Keep the title compact and simple. Do not use abbreviations. The remainder of this document allows you to define and clarify your graduation project.

Introduction

Describe the context of your project here; What is the domain in which your project takes place? Who are the main stakeholders and what interests are at stake? Describe the opportunities (and limitations) in this domain to better serve the stakeholder interests. (max 250 words)

Reading is a fundamental skill essential for successful participation in society. In the realm of design, continuous learning and knowledge acquisition are paramount for the growth and development of novice designers. Design books serve as invaluable resources, offering foundational theories, practical insights, and real-world examples crucial for honing design skills and expanding creative horizons.

However, research by Huang, Capps, Blacklock, and Garza (2014) suggests that college students dedicate less time to academic reading, often favoring social media engagement over reading activities. This trend underscores the importance of understanding reading motivation, particularly in educational contexts, where a lack of motivation may contribute to decreased engagement with academic materials. A significant body of research has highlighted the strategic effort and motivation required for effective reading. Since the early 20th century, reading motivation has emerged as a major research topic, with a notable increase in studies exploring this area (Huang and Reynolds, 2022). Despite the growing recognition of motivation's significance in reading, the study of college students' motivation to read remains relatively underdeveloped (Lin, Wong, & McBride-Chang, 2012). Given that many novice designers are college students, investigating their motivation to engage with design books presents an opportunity to address this research gap.

Therefore, this project seeks to explore the motivation of novice designers to engage with design literature and develop interventions aimed at enhancing their reading motivation, so as to reinforce their concepts of design and facilitating their professional growth as designers.

Huang, S. H., Capps, M., Blacklock, J., & Garza, M. (2014). Reading Habits of College Students in USA. Reading Psychology, 35(5), 437-467
Lin, D., Wong, K. K., & McBride-Chang (2012). Reading Motivation and Reading Comprehension in Chinese and English among Bilingual Students. Reading and Writing, 25(3), 717-737.
Huang, S. and Reynolds, M. (2022) 'Facts that influence college students' reading motivation', ATHENS JOURNAL OF EDUCATION. 9(2). pp. 187–210. doi:10.30958/aie.9-2-1.

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introduction (continued): space for images

image / figure 1 Current Problem: College students are less motivated to read books

image / figure 2 Object of design: Design books which can inspire novice designers

Personal Project Brief – IDE Master Graduation Project

TU Delft

Problem Definition

What problem do you want to solve in the context described in the introduction, and within the available time frame of 100 working days? (= Master Graduation Project of 30 EC). What opportunities do you see to create added value for the described stakeholders? Substantiate your choice.
(max 200 words)

Despite the benefits of reading design books for the personal growth of novice designers, many struggle to stay motivated and sustain their reading behaviors. Many professors have noticed that students' compliance with assigned readings is considered low (Starcher and Proffitt, 2011).
Drawing from reading motivation theories such as self-determination theory, expectancy-value theory, interest theory, and achievement goal theory (van der Sande et al., 2023), reading motivation is intricately linked to factors such as autonomy, relevance, ability, interests, goals, and expectations. By investigating the reading motivation of novice designers through the lens of these theoretical frameworks and exploring the interplay of these influencing factors, there is an opportunity to design interventions aimed at fostering a greater motivation to read. Furthermore, in the "Attention Economy", social media uses many design mechanisms to attract attention and motivate users to keep using. For example, Instagram's endless information flow and TikTok's social attributes. While these mechanisms may contribute to increased user engagement and addiction, there is also potential to leverage them in motivating novice designers to engage with reading materials.
Starcher, K., & Proffitt, D. (2011). Encouraging Students to Read: What Professors are (and aren't) Doing about it. International Journal of Teaching and Learning in Higher Education, 23(3), 396-407
Van der Sande, L. et al. (2023) 'Effectiveness of interventions that foster reading motivation: A meta-analysis', Educational Psychological Review, 35 (1). doi: 10.1007/s10648-023-09719-3

Assignment

This is the most important part of the project brief because it will give a clear direction of what you are heading for. Formulate an assignment to yourself regarding what you expect to deliver as result at the end of your project. (1 sentence) As you graduate as an industrial design engineer, your assignment will start with a verb (Design/Investigate/Validate/Create), and you may use the green text format:

I will design an intervention (could be an app/interactive artefact) to increase the motivation of novice designers to read design-related books.

Then explain your project approach to carrying out your graduation project and what research and design methods you plan to use to generate your design solution (max 150 words)

The project is divided into three main phases, with research and design phases possibly overlapping each other in places.

For research, the main research objectives are:
a) Create an understanding of the concept and theories of motivation and its importance in reading behavior
b) Investigate the psychological mechanisms driving engagement in certain social media platforms and games
c) Investigate the relevant aspects in design books that motivate or demotivate novice designers
d) Test and find what kind of interventions and interactions can increase motivation
I will use literature review, interviews, diaries and co-creation sessions to gain insights both from novice designers and design experts.

For design, I will use brainstorm sessions, rapid prototype iteration and user test to iterate design concepts.

For evaluation, I will invite 6-8 participants to evaluate the final concept. Evaluation forms and interviews will be conducted.

Project planning and key moments

*To make visible how you plan to spend your time, you must make a planning for the full project. You are advised to use a Gantt chart format to show the different phases of your project, deliverables you have in mind, meetings and in-between deadlines. Keep in mind that all activities should fit within the given run time of 100 working days. Your planning should include a **kick-off meeting**, **mid-term evaluation meeting**, **green light meeting** and **graduation ceremony**. Please indicate periods of part-time activities and/or periods of not spending time on your graduation project, if any (for instance because of holidays or parallel course activities).*

Make sure to attach the full plan to this project brief.
The four key moment dates must be filled in below

Kick off meeting	28 2 月 2024
Mid-term evaluation	13 5 月 2024
Green light meeting	18 7 月 2024
Graduation ceremony	29 8 月 2024

In exceptional cases (part of) the Graduation Project may need to be scheduled part-time. Indicate here if such applies to your project

Part of project scheduled part-time	
For how many project weeks	
Number of project days per week	

Comments:

Motivation and personal ambitions

Explain why you wish to start this project, what competencies you want to prove or develop (e.g. competencies acquired in your MSc programme, electives, extra-curricular activities or other).

Optionally, describe whether you have some personal learning ambitions which you explicitly want to address in this project, on top of the learning objectives of the Graduation Project itself. You might think of e.g. acquiring in depth knowledge on a specific subject, broadening your competencies or experimenting with a specific tool or methodology. Personal learning ambitions are limited to a maximum number of five.
(200 words max)

I am interested in the field of design education and am eager to explore innovative ways to make professional books reading more engaging. Inspired by the captivating nature of social media platforms and games, I aspire to break away from the traditional perception of reading professional books and design learning as 'boring'. My personal career aspirations also incline towards education or library science, which motivates me to undertake a project related to reading, design education, and libraries. Through this project, I aim to establish connections with relevant individuals and gain a deeper understanding of and explore opportunities within these fields.

For my personal learning ambitions, I hope to apply the co-creation skills I learnt in the first semester, facilitating sessions and collaborating with target clients. Furthermore, I'm quite interested in the psychological and behavioral theories and I hope I can broaden my competences through experimenting with these methodologies. In addition, I want to practice my project management skills, including time management and project scheduling, reporting and updating the process, and making decisions independently.