
Information Systems to Enhance Focus in the Learning Process Using Design Thinking Methodology

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ABSTRACT

This study adopts the Design Thinking methodology to investigate the habits, needs, and challenges faced by students when attempting to maintain focus during activities that require concentration. The research surveyed students, with a significant proportion (approximately 53% of all participants) reporting frequent loss of focus during tasks. External disturbances, such as an uncondusive environment, gadget notifications, and enticing distractions, were identified as the primary triggers for this lack of focus, resulting in procrastination and hindrance in achieving their main goals. In response to these findings, this research proposes a User Interface / User Experience (UI/UX) design approach to develop an application aimed at enhancing focus and learning performance to boost overall productivity. The design aims to ensure the application's interface is user-friendly and easily comprehensible. By designing an application interface that can organize focused sessions for the activities to be carried out by the users. The UI/UX design of this application holds the potential to empower students in elevating their learning experience, thereby fostering higher productivity and goal achievement. The results of this research show that the use of the Design Thinking methodology achieved a score of 70% from the overall users who tested the application design using the Maze tool.

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INTRODUCTION

In this digital era, the challenge of maintaining focus in daily activities, whether at work, during studying, or in other tasks that require concentration, makes focus a crucial factor for everyone. Losing focus can lead to a decrease in mood and motivation in pursuing dreams and goals (Tambunan et al., 2020). Therefore, effective solutions need to be sought to enhance focus and productivity in carrying out these tasks. To address this issue, this study adopts the Design Thinking methodology as the primary approach used to design an application aimed at improving focus and productivity. This methodology places users at the center of the product design and development process, with a focus on a deep understanding of the needs and challenges faced by the users (Amalina et al., 2017). With this approach, it is

hoped that effective and relevant solutions can be designed to enhance user focus and performance in various daily activities.

It appears that the research conducted by (Rosyda & Sukoco, 2020), utilized the Design Thinking methodology to design and develop an application that brings together raw and semi-finished goods owners with those who need these products through an application. By employing the Design Thinking methodology, they were able to create a product that was based on the needs of many people, well-defined, and presented a holistic concept.

The main objective of this research is to design the User Interface/User Experience (UI/UX) of a Focus & Productivity Enhancement application that can help users become more focused on learning and carrying out daily activities, thereby increasing

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productivity. According to a journal written by (Blair-Early & Zender, 2008), User Interface (UI) is a component of a program that directly interacts with users, while User Experience (UX) encompasses all aspects related to the user's experience in using a product, including how easy the product is to use, the feelings experienced during its use, and how effectively users can achieve their goals.

The design of this application is expected to contribute to the field and serve as a valuable source of research for productivity application developers. It aims to be a steadfast companion for users in overcoming external disruptions such as notifications and prolonged use of social media applications, thereby boosting motivation and determination to achieve desired dreams and goals.

In the Design Thinking approach, this research will involve users by studying the common problems they face that lead to a loss of focus during their activities. Through in-depth user research, prototype testing, and feedback collection, the goal is to create an application design that aligns with the needs and preferences of users. Thus, this research strives to provide a significant contribution to addressing challenges related to focus and productivity, offering innovative solutions for users to carry out their daily activities more efficiently and effectively.

RESEARCH METHOD

In designing the systematic design of an application, several methodologies that can be utilized, including Lean UX, Double Diamond, User-Centered Design (UCD), and Design Thinking. In this study, the author opted to employ the Design Thinking methodology because it can address user issues with a more human-centered approach, as elucidated by (Ar Razi et al., 2018), which highlights that Design Thinking involves several stages, including the following:

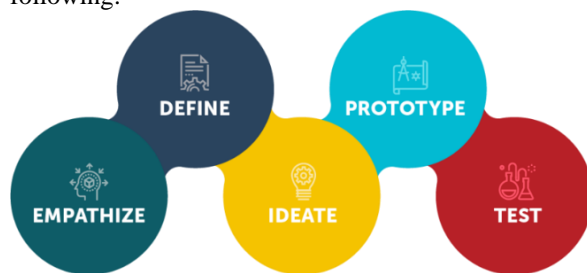


Figure 1. Stages of the Design Thinking Methodology
Source: (Telaumbanua, 2019)

1. Empathize

The stages of Design Thinking begin with empathy, where the design process centers around the user by seeking to understand them within the context of their problems. This is achieved through surveys and observations to comprehend the user's issues (McDonagh, 2010).

2. Define

The second stage involves defining, which is a process of analyzing and understanding the

information acquired through the empathy phase. The goal is to obtain a point of view or primary focus for the study (Brodny & Kazmierczak, 2017).

3. Ideate

Moving forward, the third stage is ideate, which signifies the transition from problem formulation to problem-solving. In the ideation process, the focus is on generating ideas or concepts as the foundation for creating the design prototype (Brodny & Kazmierczak, 2017).

4. Prototype

After the ideation phase, the next step is the prototype stage. In the prototype phase, an initial design of a product is created to identify early errors and explore new possibilities. This design is then tested with users to gather responses and feedback, which is used to refine the design (Luchs, 2015).

5. Test

The final stage is testing, where various user feedback is collected for the different final designs formulated through the prototype process. All these stages are part of a lifecycle, allowing for iteration and the possibility to return to earlier stages if necessary (Brown, 2009).

These stages involve user engagement, to generate solutions that align with user needs. This methodology is recognized as a comprehensive problem-solving process that begins with empathizing with user needs.

RESULTS AND DISCUSSION

The result of this research is an application design that features the ability to set a focused time for each activity session carried out by the user. This outcome was achieved through the stages undertaken using the Design Thinking methodology.

1) Empathize

In the empathy stage, the author conducted a survey among 15 students at Singaperbangsa University Karawang regarding the challenges they face concerning whether they often experience a loss of focus during their activities. The obtained percentage is as follows:

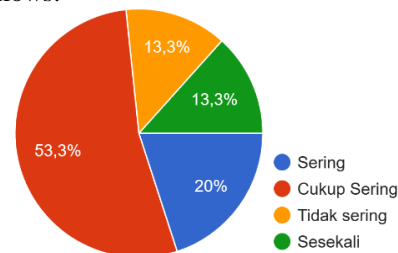


Figure 2. Percentage Diagram of How Often Focus is Lost

Source: (Rahayu et al., 2023)

In the diagram in **Figure 2**, the percentages are as follows: about 20% of students often experience a loss of focus during their activities, 53.3% feel they lose focus quite often, 13.3% don't lose focus often, and 13.3% feel they occasionally lose focus. The diagram indicates that the majority of students experience a significant loss of focus while working on their tasks.

Consequently, finding a solution to address this focus issue is necessary.

Continuing, the research proceeds to explore how students can maintain their focus while carrying out their activities. **Figure 3** is a diagram illustrating the behaviors of students to remain focused during their tasks:

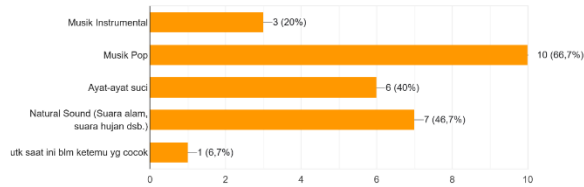


Figure 3. Diagram of Media Used to Stay Focused
Source: (Rahayu et al., 2023)

In the diagram in **Figure 3**, the percentages of student behaviors to stay focused during their tasks are as follows:

Table 1. Usage of Media to Stay Focused

Media	Percentage
Instrumental Music	20% (3 Polling)
Pop Music	66,7% (10 Polling)
Sacred Verses	40% (6 Polling)
Natural Sounds (Nature sounds, rain sounds, etc.)	46,7% (7 Polling)
Not found a suitable media	6,7% (1 Polling)

In Table 1, the data was obtained through a poll conducted among the students. This poll provided choices prepared by the author using a multiple-choice polling method, allowing respondents to select more than one option. As a result, the total number of selections may exceed the number of respondents, adjusting to each respondent's preferences. Table 1 reveals that several media are frequently used by students to help them stay focused on their activities. These media include instrumental music, pop music, sacred verses, and natural sounds such as rain and others. In the table 2 are some reasons provided by the respondents for selecting these media options:

Table 2. Reasons for Media Selection from the Poll

Media	Reasons
Instrumental Music	To become more focused and reduce distractions
Musik Pop	To become more focused and generate a lot of ideas
Sacred Verses	To become calmer and regain focus
Natural Sound	To accompany activities and relax the mind
Not found a suitable media	Still searching for a suitable media

In **Table 2**, various reasons for selecting media to stay focused during activities were identified. Additionally, here are some pain points or common issues faced by students in maintaining focus:

1. Notifications
Concentration and focus are disrupted by smartphone notifications.
2. Noisy Environment
Loud noises and an inadequate environment.
3. Procrastination
Delaying prioritized tasks.
4. Losing Track of Time
Getting too engrossed in certain applications and losing sight of main goals and tasks.

As a result, there is a need for suggestions on what features can help alleviate the pain points or issues faced by the students. Here are the suggestions provided by the students that have been received:

1. Favorite Music Collection Feature
 2. Spam Alarm Feature to remind staying focused on work, preventing excessive scrolling through platforms like YouTube, and others.
 3. Reminder or Reminder Feature for productive tasks, equipped with notes or activity notes.
 4. Tips and Tricks Feature for maintaining focus and productivity.
 5. Reminder feature for pending or delayed tasks.
 6. Scheduling or Progress Management Feature to prevent losing track of progress, aiding in maintaining focus and progress tracking.
 7. Timer feature to track the passage of time, especially for prolonged activities in front of a computer.
 8. User-friendly Application Feature, ensuring easy comprehension of the app's features and functionality.
 9. Pomodoro Method Feature, like apps such as "Forest" available on Google Play Store, for its simplicity and ease of use.
 10. Focus Mode feature to restrict the usage of specific apps to maintain focus.
 11. Schedule Planning and Time Reminder Feature to enhance time management.
 12. App Blocker Feature to limit excessive gadget usage.
 13. Music feature with a silent notification option.
 14. Timer feature with scheduling capabilities.
 15. Productivity history feature, showcasing accomplished tasks.
 16. Focus mode feature to limit the excessive use of specific apps.
 17. Effective Study Time Reminder Feature.
 18. Target Management or To-Do List Feature.
 19. Music Timer Feature.
 20. Favorite Music List Feature with lyrics, allowing for playlist sharing with other users.
- With the multitude of feature suggestions provided by the respondents, the author will simplify the design by selecting a few key features. This approach aims to facilitate the testing phase later on.

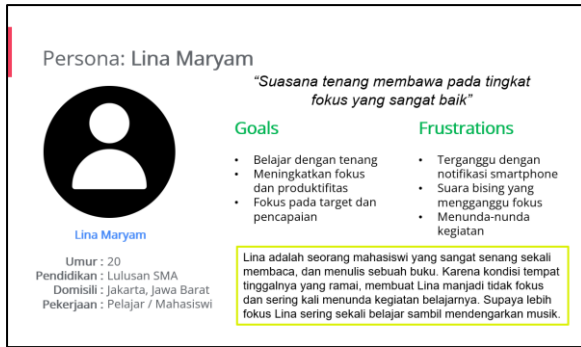


Figure 4. User Persona

Source: (Rahayu et al., 2023)

Figure 4 portrays a user persona, which is a fictional character representing the goals, needs, and characteristics of many users. Each persona represents users with similar characteristics, drawn from common pain points they experience (Novianung & Faizin, 2023a). Utilizing user personas helps attain a point of view from the core issue and aids in comprehending user pain points (Hidayati, 2021). Subsequently, to depict user needs in achieving their objectives, these can be formulated in the form of user stories. These stories are derived from the persona's perspective, outlining their problems, needs, and the benefits they seek (Novianung & Faizin, 2023b). Here's a user story from the earlier persona:



Figure 5. User Story

Source: (Rahayu et al., 2023)

Figure 5 presents a user story derived from the persona created earlier. This story involves a female student who wants to study peacefully to enhance her focus in understanding knowledge, become more productive, and achieve her dreams. This series of stories encompasses three parts: the user's role, their desire, and the benefits they seek.

2) Define

The next stage following the identification of user pain points or issues is the "define" stage. This phase involves analyzing and comprehending the various pieces of information obtained through the empathy process. The aim is to establish a point of view or primary focus for the research.

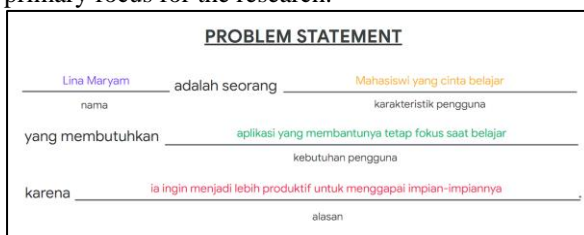


Figure 6. Problem Statement

Source: (Rahayu et al., 2023)

Figure 6 showcases a problem statement that broadly outlines the issues perceived by users. In this scenario, there's a user characterized as a student in need of an application that can help them stay focused while studying. The objective is to increase productivity, enabling them to reach their aspirations.

3) Ideate

The next stage, following the acquisition of user problem data and identification of pain points, as well as having a broad understanding of the issues through the problem statement, is the "ideate" stage. During this phase, potential solutions are generated to address the problems perceived by users. In the ideation stage, a method called "brainstorming" can be utilized, employing the "How Might We" (HMW) approach. Here's the brainstorming process using HMW:

- Creating the option for a focus mode choice after the user authentication process.
- Design of feature settings preferences to modify the focus mode.
- Implementing an option to customize focus duration according to individual needs.
- Designing focus time targets for daily, weekly, monthly, and yearly durations.

4) Prototype

In this prototype phase, several steps will be taken before commencing the actual design of the application interface. This includes creating a goal statement, user flow, and digital wireframes. Once these steps are completed, the next stages involve developing a mockup and prototype for the application.



Figure 7. Goal Statement

Source: (Rahayu et al., 2023)

Figure 7 presents a goal statement for the prototype phase, outlining the product name to be created, the user actions, the target audience of the designed application, the impact users will receive from using the app, and evaluating the effectiveness of the design to ascertain its alignment with user needs. Where the product name to be created is "Focuskuy," aiming to help users achieve better focus and relaxation. The intended impact is on students or professionals, assisting them in achieving enhanced focus, setting clear goals, and ultimately increasing productivity while facilitating effective prioritization of tasks. The effectiveness of the design will be measured through user feedback and the duration of users' accomplishments. Next, the process continues by creating a user flow outlining the sequence of interactions within the designed application.

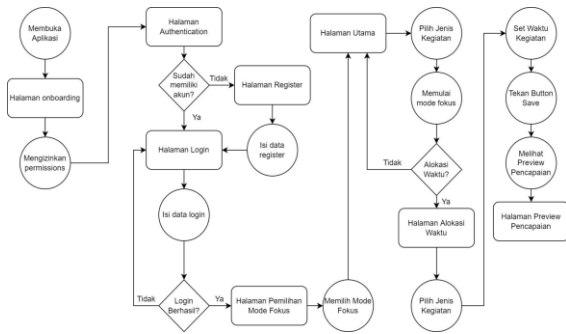


Figure 8. User Flow

Source: (Rahayu et al., 2023)

Figure 8 displays a user flow illustrating the sequence of user interactions within the designed application. It begins with opening the app, going through the onboarding process, granting necessary permissions, proceeding to the authentication page encompassing login and registration steps as is common in most apps. After successful login, users can select their initial focus mode. This leads to the main page, where users pick the type of activity they wish to engage in. Upon initiating the focus mode, users can set the time allocation for the task. If not specified previously, users will then allocate the time. The user can then choose the activity type, set its duration, and save the activity time. Additionally, users can preview their achievements by using the app. After creating the user flow, the next step involves developing a digital wireframe for the application's design.

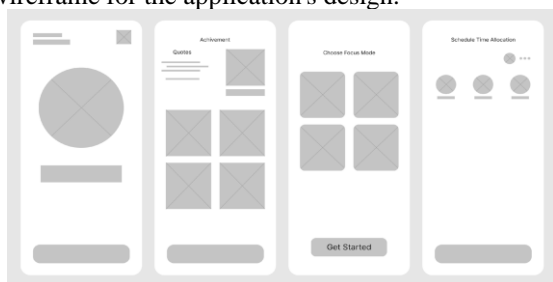


Figure 9. Wireframe Digital

Source: (Rahayu et al., 2023)

To view the complete digital wireframe, you can access the following link: <http://bitly.ws/S62k>. Here is an explanation of the main functions offered in the digital wireframe.

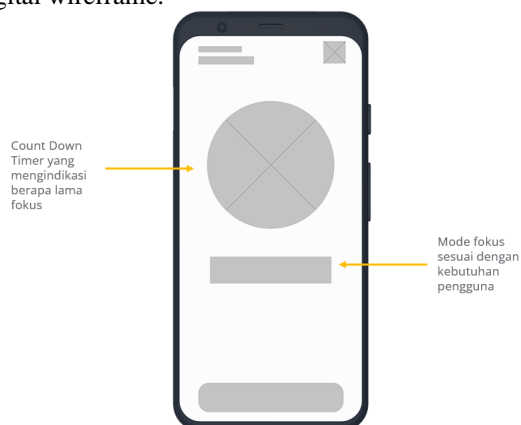


Figure 10. The main function of digital wireframes

Source: (Rahayu et al., 2023)

Figure 10 illustrates a digital wireframe depicting the main functions offered by the application's design. It includes a countdown timer indicating the duration of focus and focus mode tailored to the user's needs. Afterward, a mockup is created based on the previously developed digital wireframe.

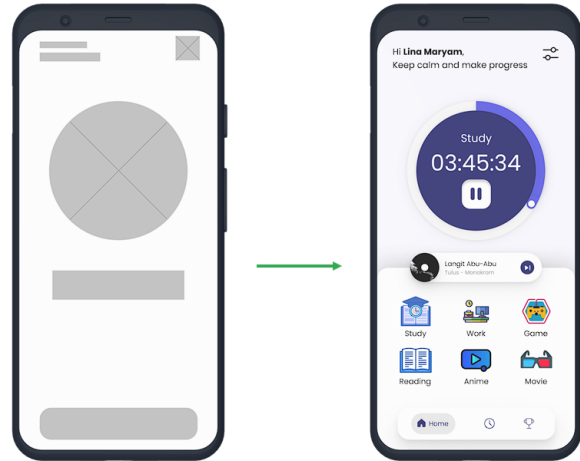


Figure 11. Transformation from digital wireframe to mockup

Source: (Rahayu et al., 2023)

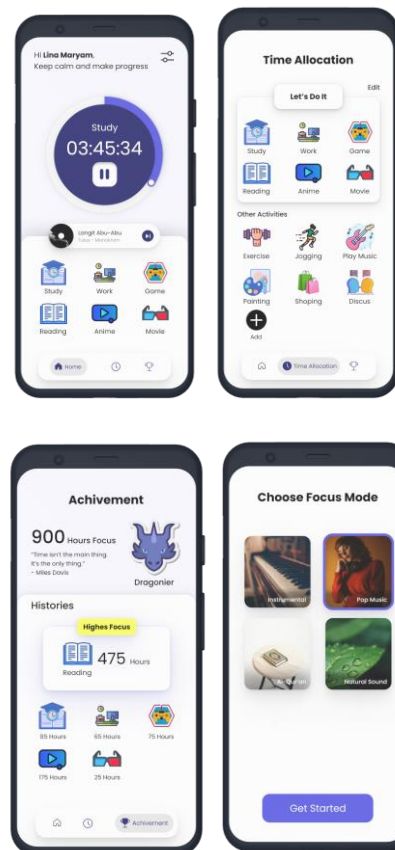


Figure 12. Mockup

Source: (Rahayu et al., 2023)

To view the complete mockup, you can access the following link: <http://bitly.ws/S6rx>. From the mockup, there are several considerations for user accessibility, including the following:

- a) Providing access for users with visual impairments

- by adding alternative text to images.
- b) Using icons to make navigation easier.
- c) Using images for clear focus mode selection to assist all users in understanding.

After creating the mockup, a prototype of the designed application can be developed. Here are the results of the Focuskuy application design prototype:

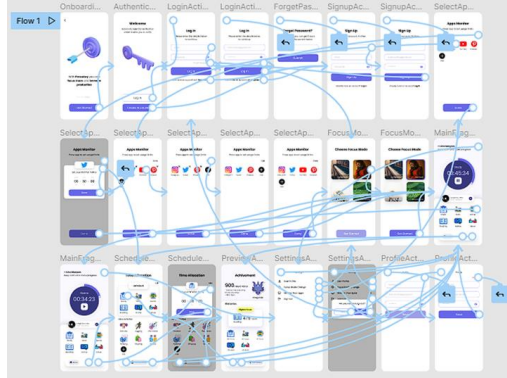


Figure 13. Prototype
Source: (Rahayu et al., 2023)

In **Figure 13**, you can see the prototype flow of the designed application. To try it out, you can access the following link: <http://bitly.ws/S79R>.

5) Test

The next step after creating a prototype is the testing phase of the designed product. This step is crucial to ensure that the design aligns with user needs rather than being solely based on assumptions made by the designer. To facilitate the testing process, we can engage in a process known as UX Research, starting with planning, conducting research, analyzing research outcomes, and sharing research findings. Here are the steps involved in UX Research:

a) Usability Study Plan

(1) Background

The Focuskuy application aims to address focus and productivity-related issues. We want to determine if the application effectively enhances users' focus and productivity, from selecting focus modes to starting them and monitoring restricted apps.

(2) Research Objective

To assess the ease of use of the focus mode selection and app monitoring features.

(3) Main Research Questions:

- (a) How easy is it for users to use the focus features in the Focuskuy app?
- (b) What aspects can be improved on each page?
- (c) Does the focus feature in the Focuskuy app aid users in improving their focus?

(4) Key Performance Indicators (KPIs):

- (a) Task completion time.
- (b) Success rate.
- (c) Error rate.
- (d) Drop-off rate.
- (e) Net Promoter Score (NPS).

(5) Methodology

- (a) Unmoderated Usability Study.

- (b) Duration: August 10, 2023 – August 13, 2023.

- (c) Location: Online.

(6) Participants:

The participants in the study were active students currently pursuing their studies, with a total of 15 participants.

(7) Script:

- (a) Introduction: As a student, to achieve good focus during a task, what steps do you usually take?
- (b) Question 1: Overall, how would you describe the design of this application?
- (c) Question 2: How easily can you navigate and select menu items and features on the home page?
- (d) Question 3: Any feedback on the home page design?
- (e) Question 4: How easy is it for you to use the focus and app monitoring features?
- (f) Question 5: Do the focus and monitoring features meet your needs?
- (g) Question 6: Any feedback on the Time Allocation page design?
- (h) Question 7: Is the information on the Achievement page clear?
- (i) Question 8: Any feedback on the Achievement page design?

b) Affinity Diagram

(1) User Interface

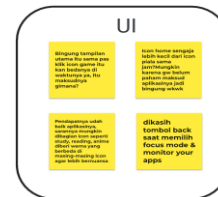


Figure 14. Affinity Diagram User Interface

Source: (Rahayu et al., 2023)

- (a) "I'm confused about the main interface, and when i click the game icon, the timing is different, right? What does that mean?"
- (b) "Is the Home icon intentionally smaller than the trophy and clock icons? Maybe because I don't understand the purpose of the app, I'm confused."
- (c) "The design of the app looks good. One suggestion is maybe adding different colors to the icons like study, reading, and anime to make them more distinctive."
- (d) "Consider adding a back button when selecting focus mode and monitoring your apps."

c) Focus Mode

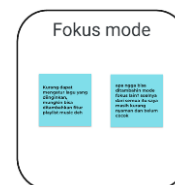


Figure 15. Affinity Diagram Focus Mode

Source: (Rahayu et al., 2023)

- (1) "It's lacking the ability to customize the desired music. Maybe you could add a playlist music feature."
- (2) "Is it possible to add other focus modes? Because from all of these options, none of them feel quite comfortable and suitable."

d) Usability Study: Insight

The Unmoderated Usability Study was conducted to determine the ease of using the focus and app monitoring features, involving a total of 15 participating students, for testing using a tool called Maze, here is the link to the test results using the Maze tool: <http://bitly.ws/SrUV>.

- (1) It turns out that users require an onboarding feature to better understand how to use the application when they first open it.
- (2) As it turns out, users want easier access to the app monitoring and focus mode features.

The following is the percentage of how easy the design of the Focuskuy application is to understand:



Figure 16. Percentage of testing using the maze tool
Source: (Rahayu et al., 2023)

Based on this test, a percentage of 70% of the total 10 respondents who answered the question of whether the display on the Focuskuy application was easy to understand or not was obtained.

e) Design Modifications

- (1) To ensure better user comprehension of the application's usage, I have added an onboarding process that will appear when the app is launched for the first time.

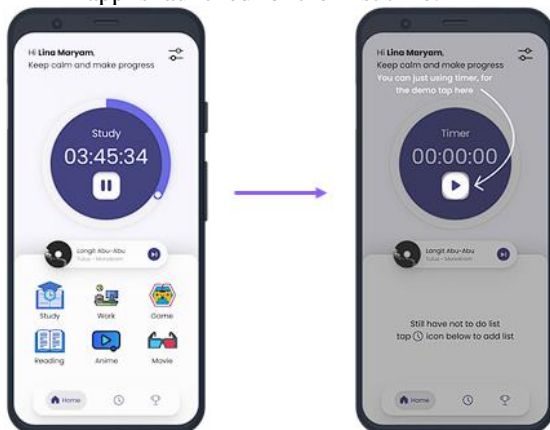


Figure 17. Design Modifications Add Onboarding
Source: (Rahayu et al., 2023)

- (2) To make it easier for users to return because there is no way to change the focus mode, I was advised to add a back button.

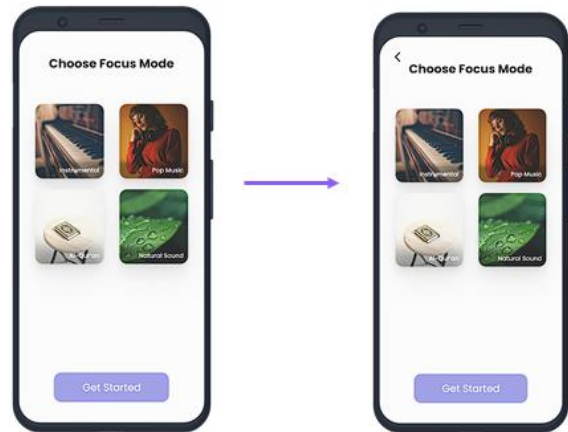


Figure 18. Design Modifications Add Back Button
Source: (Rahayu et al., 2023)

- (3) Then I was also advised to add a back button to make it easier for users to return when they don't want to set the monitor app.

CONCLUSION

Based on the research that has been done regarding the application of the Design Thinking methodology in the process of designing an application, we can minimize critical errors before the application is implemented for use by users. Design Thinking helps us understand the real problems experienced by users and how users can reduce those problems. As a result, we can create an application design that aligns with the solutions users need. In this research, a percentage was obtained from testing conducted using the Maze tool to measure the alignment of the design with user needs and to understand user behavior when interacting with the design.

By using Design Thinking and the Maze tool, a 70% understanding level of the application design was achieved, taking into account the necessary features for users. The lesson learned in designing an application is that user needs vary. Some users may need Feature A, while others may need Feature B, and some may require Feature C. This diversity in user needs emphasizes the importance of empathy and conducting UI/UX testing before delivering the design to the development team. Therefore, it is crucial to use the Design Thinking methodology to anticipate design errors and create a user-centered application design.

REFERENCES

- Amalina, S., Wahid, F., Satriadi, V., Farhani, F. S., & Setiani, N. (2017). Rancang Purwarupa Aplikasi UniBook Menggunakan Metode Pendekatan Design Thinking. *Seminar Nasional Aplikasi Teknologi Informasi (SNATI)*, 50–55. <https://journal.uin.ac.id/Snati/article/view/8457>
- Ar Razi, A., Rizky Mutiaz, I., Pindi Setiawan, dan, Teknologi Bandung Jl Ganesha No, I., Siliwangi, L., Bandung, K., & Barat, J. (2018). Penerapan Metode Design Thinking Pada Model Perancangan UI/UX Aplikasi Penanganan

- Laporan Kehilangan Dan Temuan Barang Tercecer. *Jurnal Desain Komunikasi Visual*, 03(02). <http://bit.do/demandia>
- Blair-Early, A., & Zender, M. (2008). User Interface Design Principles for Interaction Design. *Design Issues*, 24(3), 85–107. <https://doi.org/10.1162/desi.2008.24.3.85>
- Brodny, J., & Kazmierczak, J. (2017). The Design Thinking Method and Its Stages. *Systemy Wspomagania W Inżynierii Produkcji*, 6(6), 247–255. <http://yadda.icm.edu.pl/baztech/element/bwmeta1.element.baztech-81d700a1-e4ea-4257-87cf-d0b790873bc8>
- Brown, T. (2009). Change by design: How design thinking transforms organizations and inspires innovation. New York: HarperCollins. [https://www.scirp.org/\(S\(i43dyn45te-exjx455q1t3d2q\)\)/reference/referencespapers.aspx?referenceid=882875](https://www.scirp.org/(S(i43dyn45te-exjx455q1t3d2q))/reference/referencespapers.aspx?referenceid=882875)
- Hidayati, K. F. (2021). *Kupas Tuntas Soal User Persona dan Manfaatnya untuk Desain Produk*. Glints. Access from: <https://glints.com/id/lowongan/user-persona-adalah/>
- Luchs, M. G. (2015). A Brief Introduction to Design Thinking. In *Design Thinking* (pp. 1–12). John Wiley & Sons, Inc. <https://doi.org/10.1002/9781119154273.ch1>
- McDonagh, D. (2010). Rethinking Design Thinking: Empathy Supporting Innovation. *Australasian Medical Journal*, 458–464. <https://doi.org/10.4066/AMJ.2010.391>
- Novianung, T., & Faizin, A. A. (2023a). *User Persona*. Dicoding.
- Novianung, T., & Faizin, A. A. (2023b, July 31). *User Story*. Dicoding.
- Rosyda, S. S., & Sukoco, I. (2020). Model Design Thinking pada Perancangan Aplikasi Matengin Aja. *Organum: Jurnal Saintifik Manajemen Dan Akuntansi*, 3(1), 1–12. <https://doi.org/10.35138/organum.v3i1.69>
- Tambunan, P., Ardhiansyah, M. F., & Kurniawan, M. G. (2020). Pengaruh Suasana Lingkungan Belajar Terhadap Konsentrasi Belajar Siswa Dalam Mata Pelajaran Produktif. *Jurnal PenSil*, 9(3), 165–171. <https://doi.org/10.21009/jpensil.v9i3.16674>