FACULTY OF COGNITIVE SCIENCE AND HUMAN DEVELOPMENT

KMK 3323 HUMAN-COMPUTER INTERACTION

PHASE 3: Low-Fidelity Evaluation and Iteration (Task 3)

Title: Gamified Period Tracking App

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1.0 Introduction

Following the conceptual design established in Phase 2, we proceeded to the Low-Fidelity Evaluation phase. The objective of this phase was to identify critical usability issues early in the design lifecycle using a simple paper prototype. By observing real users interacting with the printed interface, the team aimed to validate the Minimum Viable Product (MVP) features defined in Phase 1, specifically focusing on logging efficiency, gamification clarity, and privacy controls, before committing to coding the final app.

2.0 Paper Prototype Construction

To ensure the evaluation was effective, we created a complete paper prototype using the digital designs from Phase 2. Every screen of the app was printed on a separate sheet of paper to represent the interface.

Prototype Setup:

- Printed Screens: We printed all of the pages including the Home, Calendar, Logging, Analytics, Badges, and Settings screens on standard A4 paper.
- Layout: We laid out all the printed pages on the table at once. This allowed the user to see the entire app interface in front of them, providing an overview of the available screens.
- Static Pages: The prototype consisted of static, printed sheets representing the different states of the application.

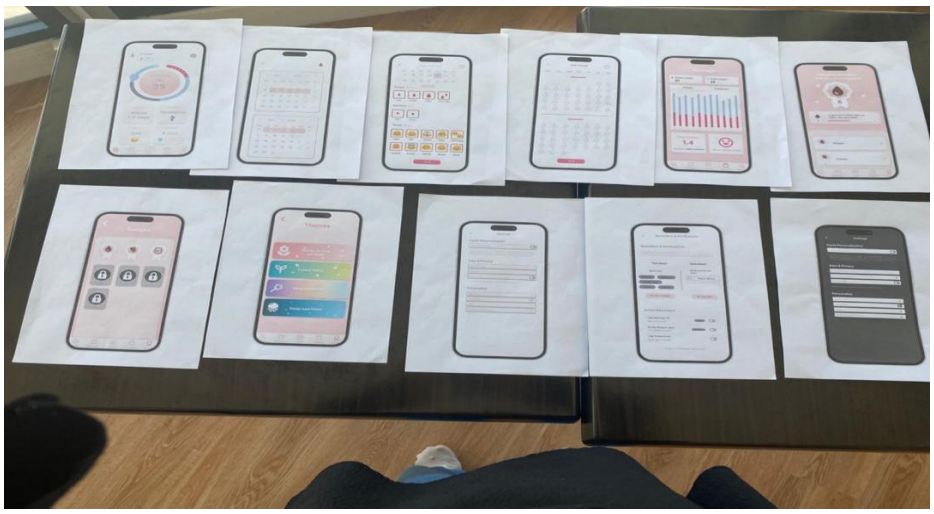


Figure 1: All pages of the paper prototype laid out on the table

3.0 Evaluation Methodology

3.1 Method Selection: Cooperative Evaluation

The team selected Cooperative Evaluation as the testing method. This method involves a natural dialogue between the participant and the evaluator during the test. The user and evaluator discuss the tasks and design elements as they proceed, allowing the evaluator to clarify the system state and the user to explain their thought process in real time.

3.2 Participants

The evaluation was conducted with five (5) female university students. This number adheres to the standard recommendation that five users are enough to find the most important usability problems. All participants fit our target user group: female students aged 19–24 who use smartphones daily.

3.3 Procedure

1. Setup: We arranged all the printed screens on a table so the user could see everything clearly.
2. Briefing: We explained to the participants that we were testing the design, not them. We asked them to speak their thoughts out loud as they tried to use the app.
3. Task Execution: We asked them to perform six specific tasks (like logging a period or setting a reminder).
4. Interaction: During each task, we showed the user which page they are currently on. The user scanned the page and interacted with it. We then showed the user which page they were lead to or ask them questions if there is any error during the interaction.
5. Recording: One team member took notes on any errors or confusion the user expressed.

3.4 Usability Tasks

The evaluation covered the following critical scenarios:

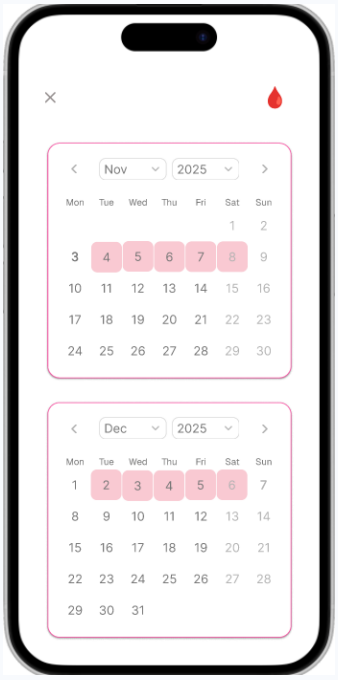
- Task 1 (Cycle Prediction): "You are planning a holiday for next month. So, you want to check if you will have your period around 10th January. Please check your calendar."
- Task 2 (Fast Logging): "Today, you just got your period with a heavy flow and you feel sad, please log this into the app."
- Task 3 (Reminders): "You keep forgetting to log your period. So, you want the app to remind you 1 day before your cycle starts. please set this in the reminder.
- Task 4 (Privacy Mode): "You are in the library and you do not want people to see your period data. Please turn on the privacy mode to hide them."
- Task 5 (Analytics): "You feel like your cycle is irregular. Please find the page that shows your analytics to see if your cycle is normal.
- Task 6 (Gamification): "You want to collect as much badges as you can. Please open the badges page and see what you need to do unlock them.

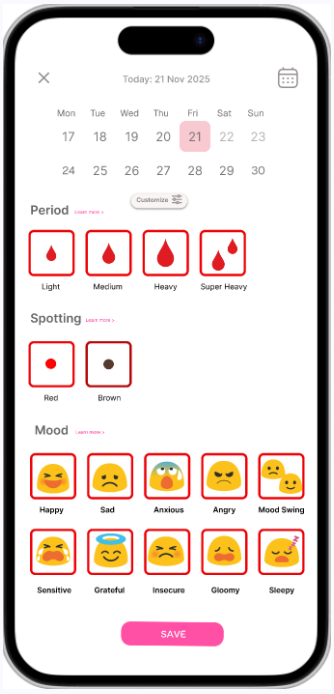
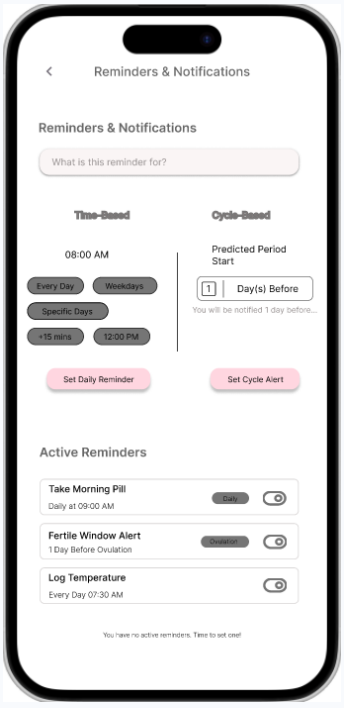
Figure 2: User is pressing a button on the paper prototype

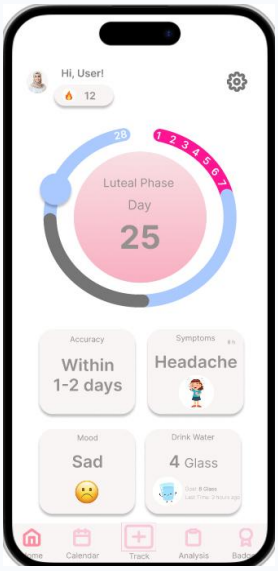
4.0 Findings and Analysis

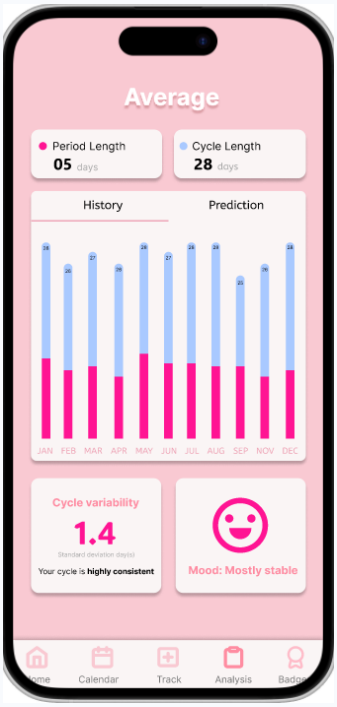
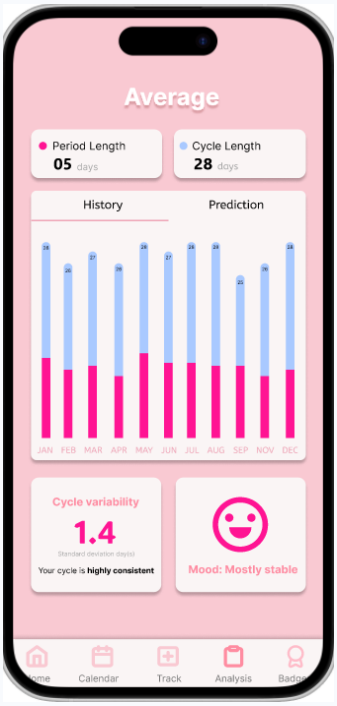
The evaluation revealed **seven (7) usability problems**. The table below explains what happened and which specific design principle was violated.

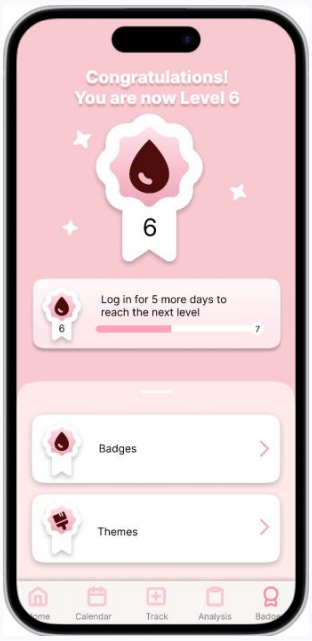
Table 1: Usability Findings and Analysis

No.	Usability Problem	Severity	Observation / Evidence	HCI Principle Violated
1 	Calendar Buttons vs. Swiping	Medium	Users tried to "swipe" their finger across the paper calendar to change months, ignoring the small arrows we printed.	Match Between System and the Real World (Nielsen #2): The system should speak the user's language. In the real world of smartphones, people swipe to turn pages, so the app should work that way too.
2	Unsure if Saved	Medium	After users pointed to the "Save" button, we told them they were	Feedback (Don Norman): The system should always tell the user

			back on the Home screen. They looked confused because there was no "Success" message to tell them it worked.	what is happening. Without a confirmation message, the user doesn't know if their action succeeded.
3 	Cannot Set Time for Cycle Alert	Medium	Users were frustrated that the "Cycle-Based" reminder page didn't have a box to set the Time (like 7:00 AM), while the other reminder page did.	User Control and Freedom (Nielsen #3): Users should have the freedom to control the system. The app forced them into a notification time they didn't choose.
4	Difficulty	High	Users	Flexibility and

 	Locating Privacy Mode		struggled to find the Privacy Mode. Even though all pages were on the table, they looked at the Home screen first and did not think to check the Settings page.	Efficiency of Use (Nielsen #7): Common actions should have shortcuts. Hiding an important privacy feature inside a menu makes it too slow to use in an emergency.
5	Analytics Graph Not Detailed	Medium	Users pointed to the bars on the graph, wanting to see the exact dates and numbers. The printed	Visibility of System Status (Nielsen #1): Users expect to see the real status of the system (the data). The

			graph was just a picture and didn't show specific details.	design hid the important numbers behind a simple drawing.
6 	Unclear Analytics "Cycle variability"	Medium	Users tried to click on the "Cycle variability" section, wanting to see more details. They mentioned that it is confusing and wants more information for it.	Help and Documentation (Nielsen #10): The system should provide help when needed. In this case, users need help to understand the "Cycle variability" part.
7	Unclear Badge	High	Users tapped the locked	Help and Documentation

	Requirements		(grey) badges expecting to see instructions, but nothing happened because the paper page had no extra information. Users were confused about how to unlock them.	(Nielsen #10): The system should provide help when needed. Users need to know exactly what steps to take to achieve a goal.

5.0 Iteration Plan (Redesign for Phase 4)

Based on these findings, we will make the following specific changes when we code the final app in Phase 4.

1. Swipe Navigation (Fixing Problem 1)

- Redesign: In the final application code, we will enable swiping left and right to change months on the calendar, instead of just using small arrows.
- Justification: This Matches the Real World habits of smartphone users, making the app feel more natural.

2. "Saved" Confirmation Message (Fixing Problem 2)

- Redesign: We will add a temporary message that pops up at the bottom of the screen saying "Symptoms Saved Successfully" immediately after the user saves.
- Justification: This gives Feedback to the user so they know the app is working correctly.

3. Better Reminder Settings (Fixing Problem 3)

- Redesign: We will change the Reminder settings so that users can select a specific time for all types of reminders, not just daily ones.
- Justification: This gives the User Control over their own schedule.

4. Privacy Mode Shortcut (Fixing Problem 4)

- Redesign: We will put a small "Eye" icon directly on the top of the Home Dashboard. Tapping this will instantly hide sensitive data without needing to go to Settings.
- Justification: This makes the app Efficient to use, allowing users to protect their privacy instantly.

5. Interactive Graphs (Fixing Problem 5)

- Redesign: We will make the graphs interactive. When a user holds their finger on a bar in the graph, a small label will appear showing the exact number and date.
- Justification: This ensures the Visibility of the data, keeping the design clean but making the details available on demand.

6. Small Information button (Fixing Problem 6)

- Redesign: In the final app, there will be a small circular “i” button that users can click

to get more information about the “Cycle variability” part of the Analytics page.

- Justification: This provides Help exactly when the user needs it.

7. Pop-up Instructions for Badges (Fixing Problem 7)

- Redesign: In the final app, when a user taps a locked badge, a small window will pop up saying exactly what to do (e.g., "Log in for 7 days to unlock").
- Justification: This provides Help exactly when the user needs it.

6.0 Conclusion

Phase 3 was very useful for finding navigation problems. While the look of the app (from Phase 2) was good, testing it with printed pages showed us that we need to improve how the app gives feedback and how users move between screens. The plan above outlines exactly how we will fix these issues in the final coded version to make the app easy and comfortable to use.

References

Nielsen, J. (1994, April 24). *10 Heuristics for User Interface Design*. Nielsen Norman Group. https://www.nngroup.com/articles/ten-usability-heuristics/

Norman, D. (2013). *The Design of Everyday Things*. MIT Press. (Original work published 1988)

Appendices

Appendix A: Link for Evaluation Session Video

User 1: https://youtu.be/-J_wAjTfqjU?si=FWAriUMTesLQAYz2

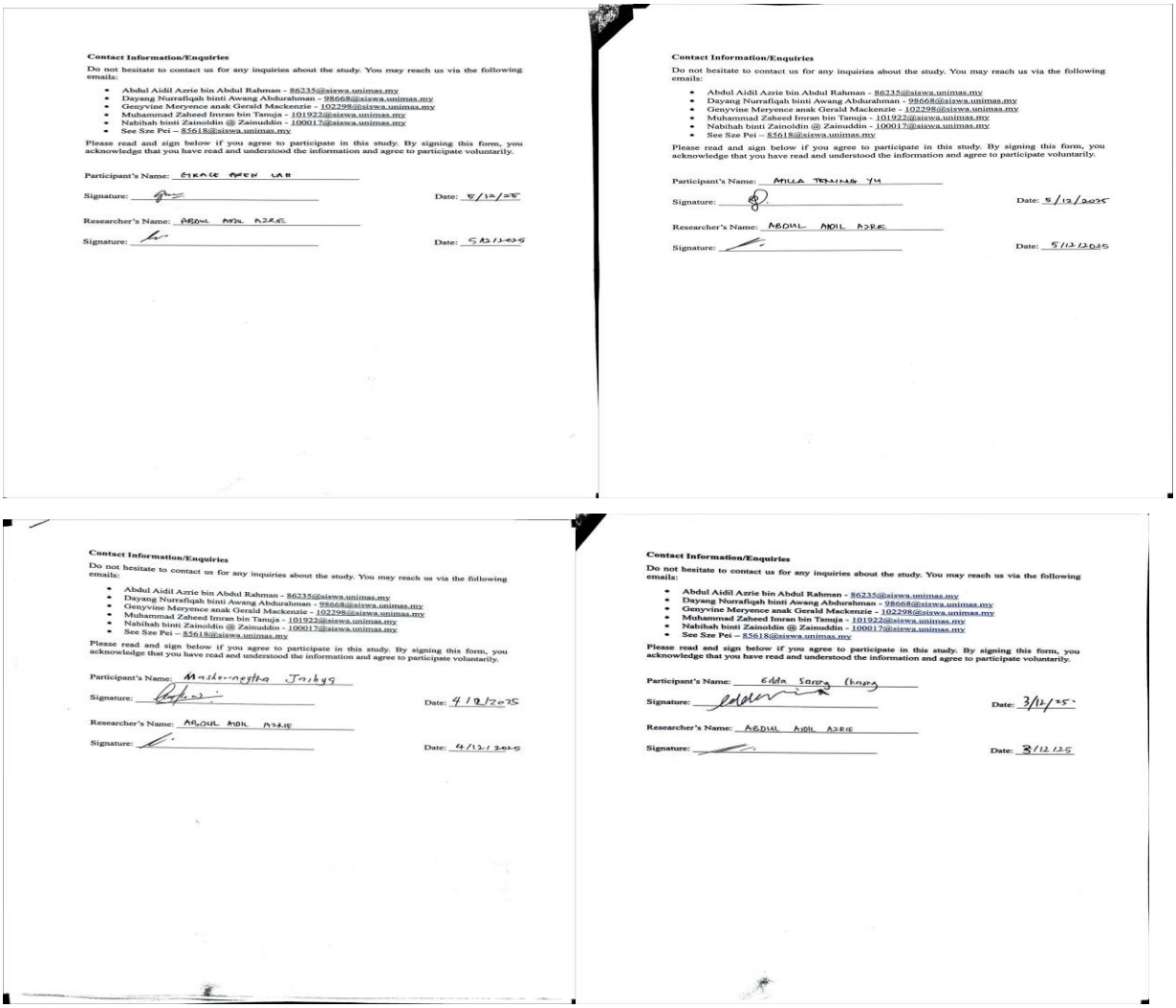
User 2: https://youtu.be/bI2OLIoHEqM?si=fZIhKddbshMlER6g

User 3: https://youtu.be/Urd9dAk6SJ0?si=LWZSH2FmK81ha91n

User 4: https://youtu.be/QFuen-INcDM?feature=shared

User 5: https://youtu.be/YysBH9bRmdM?feature=shared

Appendix B: Consent Forms



Contact Information/Enquiries

Do not hesitate to contact us for any inquiries about the study. You may reach us via the following emails:

- Abdul Aidil Azrie bin Abdul Rahman - 86235@siswa.unimas.my
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Please read and sign below if you agree to participate in this study. By signing this form, you acknowledge that you have read and understood the information and agree to participate voluntarily.

Participant's Name: EDDA SARAH LAH

Signature: Date: 5/12/25

Researcher's Name: ABDUL AIDIL AZRIE

Signature: Date: 5/12/2025

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Participant's Name: AMILA TANJAH YM

Signature: Date: 5/12/2025

Researcher's Name: ABDUL AIDIL AZRIE

Signature: Date: 5/12/2025

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Participant's Name: Maisharaetta Jaihys

Signature: Date: 4/12/2025

Researcher's Name: ABDUL AIDIL AZRIE

Signature: Date: 4/12/2025

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Participant's Name: Edda Sarah Lah

Signature: Date: 3/12/25

Researcher's Name: ABDUL AIDIL AZRIE

Signature: Date: 3/12/25

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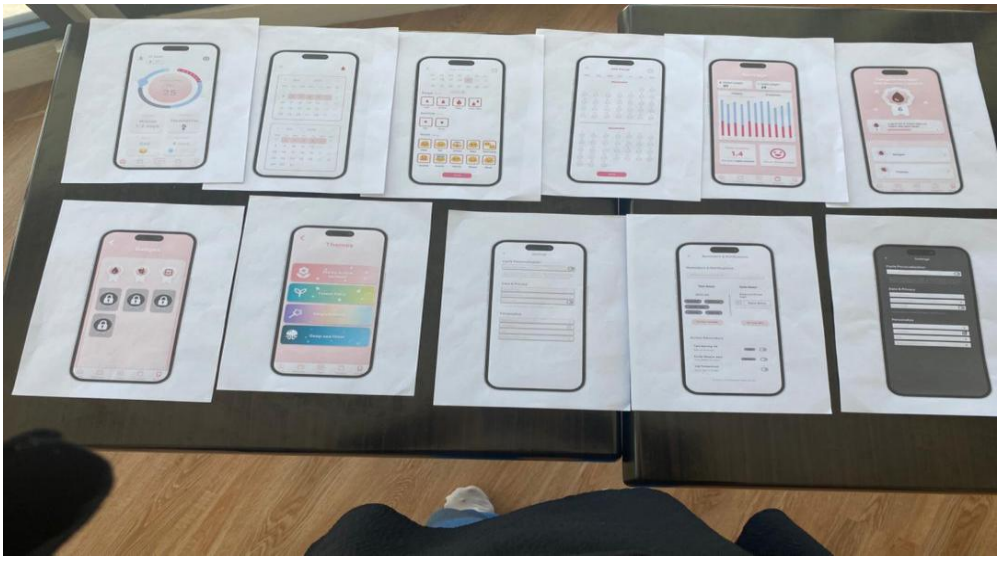
Participant's Name: Sandra George Juin

Signature: [signature] Date: 05th Dec 2025

Researcher's Name: ABDUL AIDIL AZRIE

Signature: [signature] Date: 5/12/2025

Appendix C: Paper Prototype Screens



Task Contribution:

Name	Contribution
Abdul Aidil Azrie	- Group leader - Editing task for users - Conducted the evaluation with users - Print prototype into Paper-Based
Genyvine Meryence	- Group co-leader - Find participants as target users - Conducted the evaluation with users
Muhammad Zaheed Imran	- Active member - Prepared consent form - Edit video
Dayang Nurrafiqah	- Active member - Plan task for users - Print prototype into Paper-Based - Conducted the evaluation with users
Nabihah	- Active member - Videographer - Edit video
Sze Sze Pei	- Active member