



# **Final Year Project Proposal**

**TU856**

**Project Smart learning**

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# Declaration

I hereby declare that the work described in this dissertation is, except where otherwise stated, entirely my own work and has not been submitted as an exercise for a degree at this or any other university.

Signed:

*Demi Aina*

Oludemilade Aina

03/10/2024

## Summary

The app will focus project idea is a studying app. This study app focuses on helping users retain knowledge and build better learning habits. It allows users to focus on specific skills or topics without feeling overwhelmed.

An example are generalists, who love to study multiple skills at once, however, the challenge is you can forget them naturally over time because you haven't used a skill often enough, however, sometimes you have skills you need to develop quicker than others and this is where we add some cognitive science and prioritisation to help learn efficiently. This ensures that a person can rotate between skills effectively and target skills that are important now.

The important aspect of this app is to allow users to use other apps such as: that they use for time management, knowledge and to-do lists and take the information and process it to give recommendations from changing calendars to updating to-lists based on focus. This is so users don't have to change their workflow, and this can simultaneously add my app in. This is because, generally when you add more apps for people to use, after a while they might drop as they become overwhelmed.

This app helps improve routines shows users their progress and adapts to their progress on each skill.

## Background (and References)

I cannot stress the importance of effective learning and long-term retention of information. Academic, personal relationships, personal development and skills, all improve. This is because the typical way we study, which is by rereading and memorisation, is generally inefficient and does not lead to memory retention. This has been backed by studies and through my personal experience. Justin Sung has been the main way I learnt about a lot of these techniques that I apply to my own life and his course is my main reference. However, he used books and research papers and tested them on students which is why I believe this app will just help reduce the overwhelming nature of taking some of his teaching.

- Sung, J. (2023) *Justin Sung Course*. Available at: <https://programs.icanstudy.com/academic-1#col-YkGvzcA3G-> (Accessed: 3 October 2024).

The forgetting curve was introduced by Hermann Ebbinghaus. His studies and hypothesis, show memory declines over time without any reinforcement. A periodic review of information is needed to reinforce memory and prevent forgetting. Most applications include this.

- **Ebbinghaus, H.** (1885) *Memory: A Contribution to Experimental Psychology*. Cannot access.

- **Wikipedia contributors** (2024) *Forgetting curve*. Available at: [https://en.wikipedia.org/wiki/Forgetting\\_curve](https://en.wikipedia.org/wiki/Forgetting_curve) (Accessed: 3 October 2024).

Spaced repetition was a technique developed in Hermann study and active recall however, I do not know who created active recall, as I learned it from Justin Sung course and Barbara Oakley, she has Learning How To Learn course and book.

- **Coursera** (n.d.) *Learning how to learn*. Available at: <https://www.coursera.org/learn/learning-how-to-learn> (Accessed: 3 October 2024).
- **Coursera** (n.d.) *Learning how to learn*. Available at: <https://www.coursera.org/learn/learning-how-to-learn> (Accessed: 3 October 2024).
- **Sung, J.** (2023) *Justin Sung Course*. Available at: <https://programs.icanstudy.com/academic-1#col-YkGvzcA3G-> (Accessed: 3 October 2024).
- **AnkiWeb** (n.d.) *Anki*. Available at: <https://apps.ankiweb.net> (Accessed: 13 October 2024).

Building habits is another important skill one must develop. It makes you consistently do the correct actions automatically. This reduces the chances of you not being able to study and use effective techniques while studying because it is easier to do, due to the systems and routines you have created.

- **Clear, J.** (2018) *Atomic habits: An easy & proven way to build good habits & break bad ones*. Available at: <https://www.amazon.co.uk/Atomic-Habits-Proven-Build-Break/dp/1847941834> (Accessed: 3 October 2024).

While many apps cover aspects of spaced repetition, habit tracking, and productivity, there's a gap in combining these features with a user-centered approach. In my research, I found that UX/UI design plays a crucial role. Most tools focus on individual features, but I want my app to integrate smoothly with other productivity systems, making it more versatile and user-friendly.

- **AnkiWeb** (n.d.) *Anki*. Available at: <https://apps.ankiweb.net/> (Accessed: 3 October 2024).
- **Todoist** (n.d.) *Todoist*. Available at: <https://todoist.com/> (Accessed: 3 October 2024).
- **Todoist** (n.d.) *Todoist*. Available at: <https://todoist.com/> (Accessed: 3 October 2024).
- **Obsidian** (n.d.) *Obsidian*. Available at: <https://obsidian.md/> (Accessed: 3 October 2024).

## *Proposed Approach*

My approach breaks the project into multiple sections, with clear guiding principles throughout. It moves step by step from design to building and testing, while focusing on constant feedback and quick improvements. The idea is to keep refining things until they work well, and once the key parts are solid, I'll make sure the app is strong and reliable for long-term use.

The main focus of this app is creating an environment for anyone to have an amazing user experience in which adaptive learning, properties and habit formation and works seamlessly with other applications that people are already using.

## *Design and Research*

I will be developing user personas centered around different types of learners: those who struggle with time management, balancing multiple skills, or remembering topics and applying them with ease. These personas will guide the app's design to meet their unique challenges.

Additionally, I will try to do is conduct surveys or interviews with students to identify the friction between the tools they currently use and what can be improved. For example, Notion, Obsidian, Todoist etc

Wireframes and prototypes will be done with Figma, having both low and high-fidelity for many of my screens, dashboards, scheduling, skill tree and habit tracking.

It will also have user journeys, showing how users will add skills, set priorities and review their daily schedules.

Another key aspect I plan to implement is a clean and user-friendly interface. I'll achieve this by using established design systems, like Material UI or Apple Design, while adding my own branding to give it a unique touch. This ensures the app feels native to the platform it's used on. My goal is to keep the design minimalistic and intuitive, so users can easily navigate and feel comfortable, as it aligns with the conventions, they're already familiar with from other apps

## *Implementation*

I intend for the application to have a separation of concerns, meaning the frontend the backend, the database and the APIs should not affect other parts of the application.

For the front end, I'll be deciding between Flutter and React, depending on whether I develop for web, web app, or native app. This choice is important because it can directly impact the user experience across different platforms.

As for the backend, I am debating on using go (because I know it), or Node JS (so I can rapidly iterate between as I'll be using a lot of 3<sup>rd</sup> party APIs). However, if I do data processing it might make sense to use Python, yet the scheduling algorithms need to be fast

For the database, I am debating between using two separate databases such as Postgres for now to figure out my data shape. If I believe MongoDB makes more sense: I can move to it instead of getting locked into the document style of the database and using it in conjunction with Neo4j for the mapping of relationships between skills and sub-skills.

As for the third-party APIs, I'll be investigating which applications students use to study and then use their APIs to develop my application. This is so they can use my app in conjunction with my other applications.

### *Testing and Maintenance*

Once I have figured out the shape, feel and systems of my application, I will be writing unit tests for the core functionalities of the application, which are the scheduling algorithm, skill tree and notification system.

There will be an integration test for any third-party applications to make sure they are correctly doing what I want them to do in my system. For example, Google Calendar changing on the Google service once changed on my own app.

Getting user feedback, seeing if people are enjoying the usage of my app and noting what maybe needs to be improved will also be important steps.

Performance testing will also be used in order to ensure the app works well when even managing a lot of skills, tasks and notes because people may have a lot from all the years of them using their choice of app.

### *Deliverables*

#### User Interface Design

- Low and High-fidelity Prototypes and wireframes

#### Minimum Viable Product

- Enough to present the app in a functional state
- Skill tree and syncing with 3<sup>rd</sup> party tools

There will also be Final Year Report will also be made. It will document what has been done each week, why I have changed from my original proposal in this document and the reason I have made decisions and architecture decisions and give some of the challenges I faced during the making of the app.

## *Conclusion*

The studying app proposed uses cognitive science principles and habit tracking to be more seamless, so people are able to improve their learning, prioritisation and habit tracking while focusing more on the user experience, hence allowing user to use the tools they are still comfortable with.

The project is unique due to combinations of adapting schedules and positive reinforcement to encourage users to stay consistent with the feeling of being overwhelmed or guilty about mining tasks.