



CS3240

DESIGN EXERCISE

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DESIGN TASK 4

VOCABULARY LEARNING MOBILE APPLICATION

TASK BRIEF

To create a design of a Vocabulary Learning mobile application that utilizes the lessons learnt from the 2 articles provided.

TAKEAWAYS FROM THE ARTICLES

- Current performance is not necessarily the best index of learning
- Creating difficulties during learning through variation, spacing, and interleaving etc. has desirable and undesirable outcomes
 - Desirable: responding to difficulties successfully engages the processes that support learning, comprehension and remembering
 - Undesirable: negligible outcomes if learner is unequipped to respond to difficulties successfully
- Testing
 - Triggers the act of knowledge retrieval, which is a potent learning event
 - Advantages of testing over restudying apparent after a delay
 - Short-term advantages of restudying over testing is artificial
- Restudying strengthens all of the to-be remembered items, while initial testing strengthens only the items successfully retrieved
- The active process of generating a response rather than selecting one is better for the learning process
- Harder-to-learn condition, from English to French, imposed a desirable difficulty that resulted in long-term benefits to memory and retention

DESIGN CONSIDERATIONS

Considerations regarding the learning process

- The harder-to-learn condition (English-to-French) should be adopted.
- Provide users with the option to re-study, but tests taken immediately after should not include words from this learning session.

Considerations regarding the testing process

- Should be performed once immediately after a learning session, during which the users learn new words through the application.
- Should be performed a few more times, with a given duration, perhaps a week, between these delayed tests.
- The delayed tests should have some degree of difficulty, achieved using techniques such as variation and interleaving. Questions used in these tests should be different from previous tests, and also quiz users on words from multiple learning sessions.
- The format of tests should not be multiple-choice, or other modes of testing where users select correct answer(s) from a given set of potential answers. Instead, users should have to come up with their own answers.
- Tests should not have visual cues that may help users.

General considerations

- Appealing to users
 - Simple to use, so that users are more focused on learning vocabulary than learning how to use the application.
 - In-application awards to gamify the learning process for users.
 - A social network to provide a community for users to clarify their doubts.
- Should be short, and accommodate to users' schedules
 - Users may not have the time or the attention span to go through long learning sessions.
 - Have short learning sessions, teaching no more than 10 words, that do not take up more than 15 - 20 minutes.

USER JOURNEY



Shawn Chan, 22 (NUS undergraduate, majoring in Information Systems)

Shawn is an admirer of French culture and language. Shawn had previously taken the language modules LAF1201 (French 1) and LAF2201 (French 2) in NUS, and thus has a good foundation with French grammar. However, he is unable to proceed further with French language modules in the university due to timetable constraints. Still, he wishes to continue learning French, expanding his vocabulary of French words during his free time.

	Prepare	Explore	Learn	Testing	Track	Clarify
User's Goals <i>Goals of potential users</i>	To start learning French based on his level of proficiency with the French language.	To find a lesson that will interest him.	To learn new French words.	To check on the user's learning progress	To be able to have an overview of what they have learned, and where they are with their learning.	To learn more, or to clarify doubts from others.
User's Actions <i>Actions typically taken by potential users</i>	Find online tests/ self-determine the user's own proficiency with the French language.	Find courses/ lessons online.	Learn French words from resources found online.	Takes a test, be it self-testing, or tests found online.	Consolidate their learning with their own notes.	Find online communities dedicated to learning French.
Problems <i>Problems typically faced by potential users</i>	Difficult to accurately gauge the user's proficiency.	Too many resources online, could be overwhelming for users.	Users may not have the attention span or available time to go through long learning sessions	Difficult to conduct self-testing effectively/ difficult to find a suitable test online.	Notes have to be handwritten/typed, which is time-consuming process <ul style="list-style-type: none"> • Can be seen as a form of re-studying, which, as seen in the readings, has negligible benefits. • Notes can also be misplaced/ lost 	Many such communities, such as the subreddit r/learnfrench, are not very active, and might not be very helpful.
Possible Solutions <i>How my application could solve such problems</i>	Have a quiz that tests words based on their commonness, i.e., if the user is able to get 5 very common words right, then the next 5 words tested will be less common and so on.	<ul style="list-style-type: none"> • Provide suggestions on how the user can start his learning journey • Provide curriculum(s) that users can follow 	Have short learning sessions that should not exceed 20 minutes, where users learn up to 10 words at a time.	Implement algorithm(s) in the application that creates tests based on the aforementioned considerations.	Automatically update the user's progress by keeping track of the words learnt, the words that the user is able to recall correctly during tests, and the words that the user has problems with.	To create and foster a community where users can help each other with their learning. Award badges and other in-application rewards could incentivize users to help other users.
User Experience	Excited	Uncertain	Uncertain	Anxious	Frustrated	Confused

miro

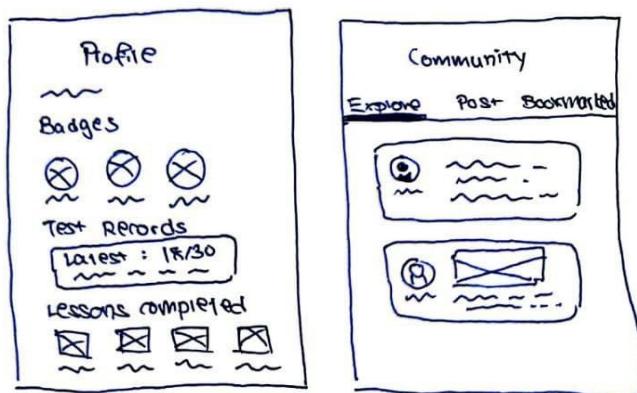
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SKETCHES



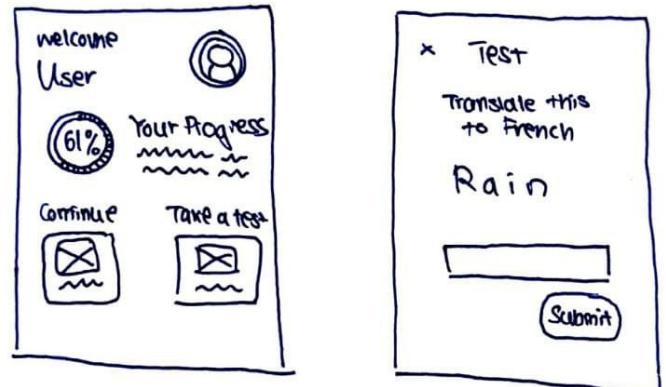
Navigation bar

- Fixed at the bottom of the application.
- Allows users to navigate through the application with ease.
- Links to:
 - Homepage
 - Lessons
 - Profile
 - Community



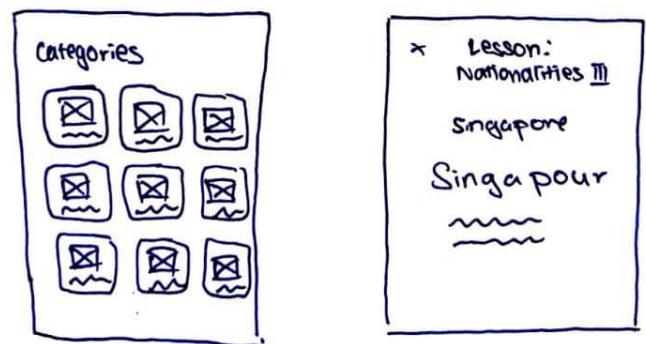
Profile Page (left), Community Page (right)

- *Profile Page* displays:
 - The user's in-game awards.
 - The user's test records and statistics.
 - The user's completed lessons.
- *Community Page* allows users to:
 - Look at others' posts
 - Create a post
 - Bookmark others' posts and comments for ease of future referencing.



Homepage (left), Test Page (right)

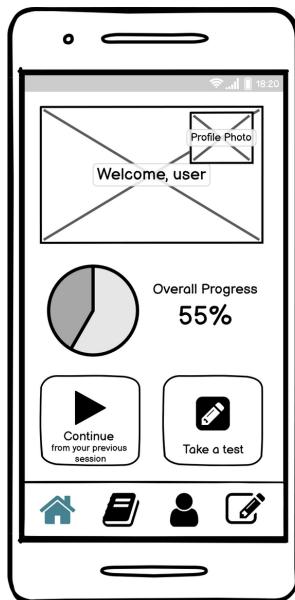
- *Homepage* displays:
 - The user's overall progress.
 - A button that allows the user to continue where he left off in the previous learning session.
 - A button that would allow the user to take a test.
- Tests would require users to provide a text input.



Topics Page (left), Lesson Page (right)

- *Topics Page* displays categories of vocabulary (e.g., Places, Food, Nationalities etc.)
- Each category contains lessons, each of which do not exceed more than 10 words.
- Lessons adopt the more challenging English-to-French direction

WIREFRAMES

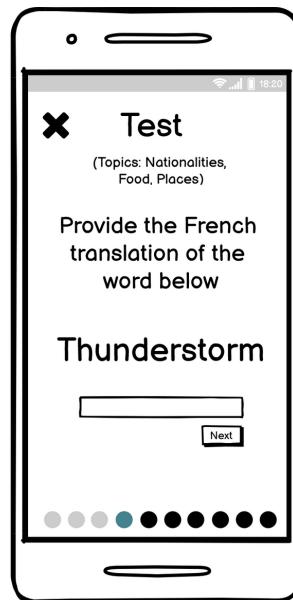


Homepage

When the user opens the application, he is greeted with the *Homepage*.

Here, he is able to:

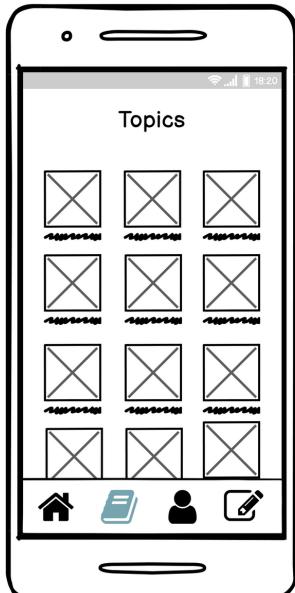
- View his overall progress
- Quickly continue from where he left off in his previous
- Take a test



Test Page

When the user taps on the *Take a test* button from the *Homepage*, he is brought to the *Test Page*.

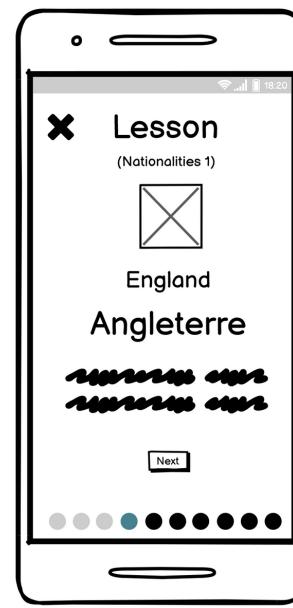
The tests would quiz the user on words from lessons completed. The words would be chosen at random, and from lessons completed at least a week ago. Focus will be on lessons completed almost exactly a week ago.



Topics Page

When the user taps the *Topics* tab in the navigation bar, he is brought to the *Topics page*.

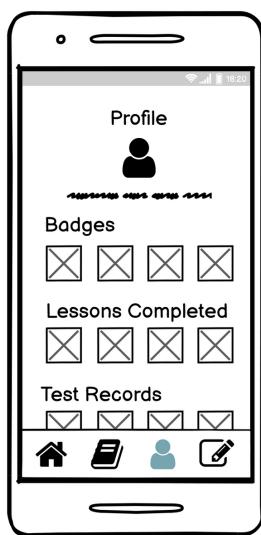
Here, he is able to view the various topics provided by the application. Each topic will have various short lessons.



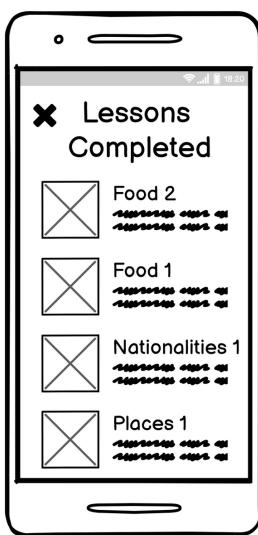
Lessons Page

Lessons will be kept short, not exceeding 10 words per lesson.

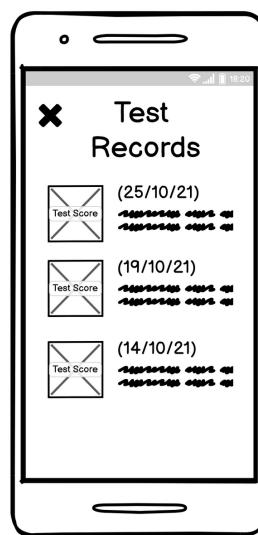
WIREFRAMES



Profile Page



Lessons Completed

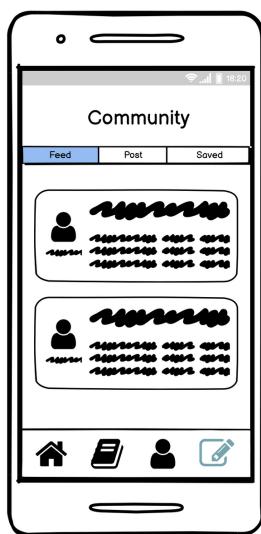


Test Records

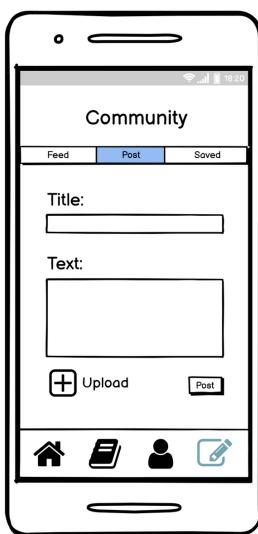
When the user taps on the *Profile* tab in the navigation bar, he is brought to the *Profile Page*

Here, he is able to:

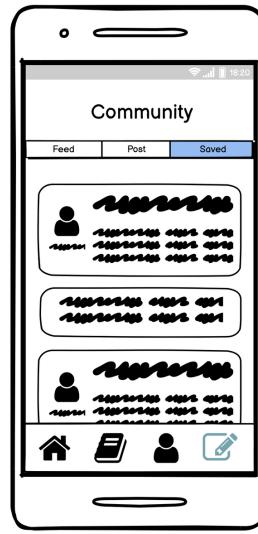
- View his badges (in-game awards)
- Be directed to the *Lessons Completed* page, where he is able to view the lessons he has completed.
 - Information beneficial to his learning, such as the words that the user has problems with in his tests, will be shown here.
- Be directed to the *Test Records* page, where he can view his past test scores.



Community Page (Feed)



Community Page (Post)



Community Page (Saved)

When the user taps on the *Community* tab in the navigation bar, he is brought to the *Community Page*

Here, he is able to:

- Browse through his *Feed*; this is where other users' posts and comments can be seen.
- Create posts.
- View posts that he has bookmarked.

HI-FIDELITY PROTOTYPE (MAIN INTERFACE)



Splash Screen



Home



Topics



Profile



Community

Figma link: <https://www.figma.com/proto/lS5Ea06LYKYalUUzIshDOr/CS3240-Indiv-Design-Exercise?node-id=54%3A2054&scaling=scale-down&page-id=0%3A1&starting-point-node-id=54%3A2054>

HI-FIDELITY PROTOTYPE (LESSON)



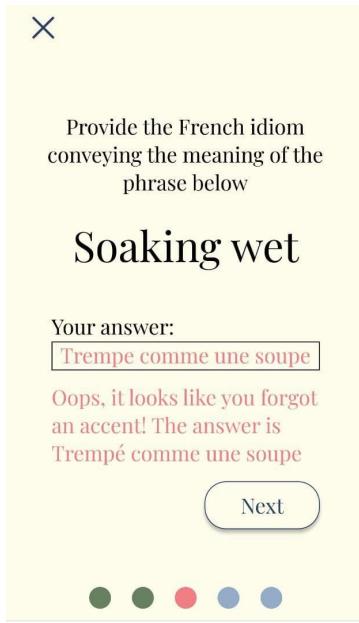
Selecting a lesson



Starting a lesson



Lesson



Quiz

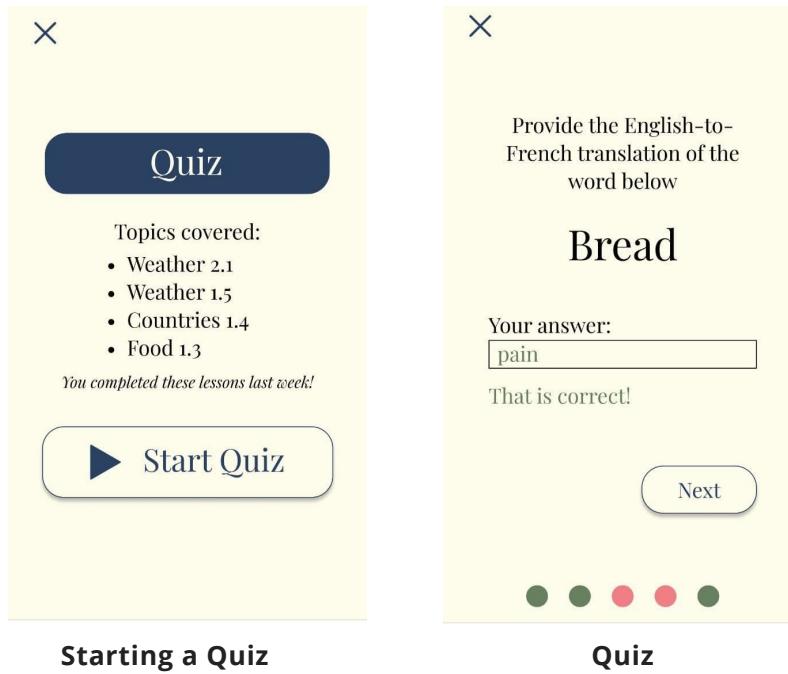
Learning Process

Through the application, the user is able to expand his vocabulary by though the application's lessons. The lessons can be accessed from the Homepage and the *Topics Page*.

The lessons follows the English-to-French direction. A flashcard-like style is adopted, with each card showing an English word/phrase and its French translation, along with a sentence in French using the translation. This would show users how the word/phrase is used in French, which should be beneficial with the user's learning process.

After the lesson is completed, the user has to go through a quiz. The order of the words/phrases in the quiz are random, and the quiz is conducted in an English-to-French direction.

HI-FIDELITY PROTOTYPE (QUIZ)



Testing Process

Through the application, the user is able to check his learning through quizzes. These quizzes would test the user based on lessons he had completed a week ago. The quiz is accessible from the *Homepage*.

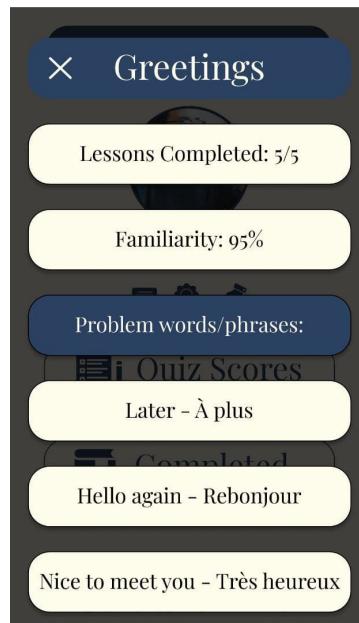
The quizzes will be developed with use of an algorithm. They will adopt interleaving and variation to make them more challenging. Words/phrases tested in the quizzes will be randomly picked from multiple lessons (provided that the user had completed multiple lessons in the previous week). Words/phrases that the user got wrong in the previous quizzes would have a higher chance of showing up in the current quiz.

Additionally, the quizzes are open-ended, requiring the user to generate a response rather than selecting one.

HI-FIDELITY PROTOTYPE (USER'S STATISTICS AND QUIZ RECORDS)



Topics Completed



**Statistics for
each topic**



**Record of Quiz
Scores**

User's statistics and quiz records

The user is able to view the statistics for each topic completed and a record of his past quizzes from the *Profile Page*. The statistics shown include words/phrases that the application has detected that the user has problems with, which could be helpful to the user.

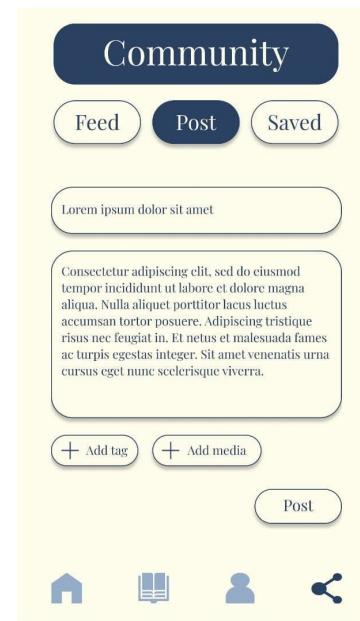
HI-FIDELITY PROTOTYPE (COMMUNITY)



Community Feed



Viewing a post from the Feed



Creating a Post



Viewing saved posts

Community

Through the *Community Page*, the application allows the user to communicate with other users. This would encourage the user with his learning journey, while also providing a platform on which the user can clarify doubts pertaining to French vocabulary with other users.

The user is able to:

- view posts
- comment on posts
- view others' comments,
- save posts and comments
- create a post
- view saved posts and comments

REFLECTIONS

Much of what was taught in the module applied to the Individual Design Exercise. For example, making a user journey map for a potential user expanding his French vocabulary without my application allowed me to better identify problems experienced by such people. This in turn, helps me think of solutions for such problems.

I had also applied concepts regarding Visual Design taught in the module. I made sure to not have light-colored words on a dark background so as for easier viewing. I also made sure to make clickable widgets distinct from non-clickable widgets by adding a shadow effect to them. Fonts, colors and icons are standardized throughout the application. Italics are used sparingly, and not at all in chunks of texts that users have to spend some time reading.

Nielsen's Heuristics were also used when developing the hi-fidelity prototype. I was unable to seek sufficient individuals for user evaluation and thus I had to conduct heuristic evaluation. Some of the heuristics I tried to adhere to are:

- **User control and freedom:** I ensured that the user would always be able to back out of a process by having a cross button at the top left side of the screen. On top of having a cross button, pop-ups can also be dismissed by tapping anywhere else on the screen.
- **Match between system and the real world:** There is no internal jargon used. Terms and icons used are straightforward and commonly used in the real world (e.g., quiz, lessons). Lessons in the application are also conducted in a manner that is similar to flipping through a deck of flashcards.
- **Aesthetic and minimalist design:** The interface of the application is kept simple. Only 5 colors are used, of which 2 are used sparingly (they are only used to indicate to the user that their response is correct/wrong). Complex images are never used, and the icons used are simple, filled icons.

APPENDIX

Miro link: https://miro.com/app/board/o9J_lqcuTVI/?invite_link_id=377714169237

Figma link: <https://www.figma.com/proto/ls5Ea06LYKYalUUZiShDOr/CS3240-Indiv-Design-Exercise?node-id=54%3A2054&scaling=scale-down&page-id=0%3A1&starting-point-node-id=54%3A2054>

All images used are from <https://unsplash.com/>

All icons used are from <https://thenounproject.com/>



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