StudAudio

Allowing Users to School On-The-Go with Audio

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Project Name and Value Proposition

Project Name

StudAudio

Value Proposition

Allow Users to School-On-The-Go with Audio

Team Members and Roles

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Problem and Solution Overview

StudAudio addresses the pain points of older adult students with hectic schedules by providing a solution that aligns with their busy lifestyles and external stressors.

First, StudAudio helps with time management and busy schedules because the app allows users to record assignments through audio, enabling older students to stay productive even when they are on the go. The ability to convert audio to text streamlines the process of organizing and managing tasks efficiently.

Secondly, StudAudio works to reduce stress of students. StudAudio offers a convenient way to convert readings to audio, transforming the studying experience into a podcast-like format. This not only caters to different learning preferences but also helps

in reducing the stress associated with traditional reading methods. The app serves as a tool for reframing the mindset, making learning more enjoyable and less burdensome.

Lastly, StudAudio increases social connection and academic confidence by enabling users to share their notes with other students as well as connect with other students who are nearby and taking the same courses. Fostering a sense of community among older students who may feel socially disconnected from the traditional student body is key to providing a better experience for older adult students returning to school. This sharing platform not only promotes collaboration but also serves as a reminder that older students have valuable insights and experiences to contribute, reinforcing their academic worth.

By addressing these pain points, StudAudio becomes more than just an academic tool; it becomes a companion that understands and supports the unique challenges faced by older students, ultimately helping them find productivity, reduce stress, and reinforce their sense of purpose and capability in the academic environment all while managing busy schedules and responsibilities. Thus, StudAudio is **allowing users to school-on-the-go with audio**.

Needfinding

Overview

For our needfinding process, we first identified participants for interviews, next, we then conducted the interviews, and lastly analyzed and synthesized the data to gather insights about the user.

In each of our interviews, we hoped to learn more about the individual's relationship with learning and experience with returning back to school to continue their education. We also wanted to understand what are some of the challenges that older adult students tend to face upon returning to school.

Some of the questions we asked them were:

1. What's your educational background?
2. What's your earliest memory of learning?
3. Memorable challenges or experiences associated with learning?
4. What challenges are you facing as an older adult student returning to school?
5. How do you see your social life impacted by attending school?
6. What's your day to day like?
7. What's your community like inside of school and outside of school?

8. What goals do you have for after education?

Interviews

*****NOTE: For each of these interviewees, we have replaced their names with a pseudonym for privacy reasons.*****

Interview 1: We interviewed Sam, a retired engineer and sales associate who is currently studying to complete his Masters in Liberal Arts at Stanford University. In the interview, Sam shared that he takes classes with his friends, however, he gets more out of his education in comparison to his friends given that he does not have other responsibilities like work. On the other hand, "His friends love it but they would tell us that they are stressed out" because they struggle to balance school and work responsibilities. (Sam).

Interview 2: We interviewed Layla, a full-time Bank of America employee who returned to school in the Bay Area to study nursing. When asked about her experience with being back in school while working, she shared that it has been "very challenging, school itself is very fast paced even though it is a part time program." (Layla). It is more challenging if you are doing it alone and do not have a support system at school or at home. (Layla). Luckily, for her, she has her family to support her and give her space when she needs to study.

Interview 3: We interviewed Peter, an administrator in academic programs at Stanford. During his interview, he shared how he's noticed that older students struggle with time management and tend to feel out of place within the undergraduate/graduation population on campus. (Peter). Moreover, many older students feel that there is a "stigma"as an older student in a classroom with a younger population. This overlaps with some of the feelings shared by other interviewees.

Interview 4: We interviewed Monica, a paraeducator at an elementary school who is considering returning to school part-time to explore a career in accounting or teaching. When asked about her thoughts on returning to school and if she would take multiple courses at the same time, she shared that she felt worried she would struggle with balancing all of her coursework along with her work and family responsibilities. She also shared she was hesitant to return to school because she would be one of the older students, afraid that she would be out of place.

Interview 5: We interviewed Rachel, a current SWE at Intuit Considering returning to school full-time to aid in career shift. When asked about her thoughts and feelings on returning to school, she shared that she has a negative association with education given that in college her emotional and mental health was not very good given that she was constantly stressed. One of her hesitations in returning is the feeling of being stressed and being able to manage that with her current job (which also demands a lot of time).

Synthesis

In our interviews with these 5 people, we came across a few common themes and topics surrounding the domain of adults returning to education. Specifically, there were a couple of similar reasons people gave for deciding to return to higher education, along with similar struggles that inhibited their experience. In this section, we've listed a couple of them.

Reasons for returning to education

The people we interviewed commonly spoke about some specific reasons that informed their decision to return to school. A couple of those include:

1. **Changing careers**: Multiple people mentioned that a significant consideration in returning to school was the ability to switch jobs. This was the main population that Peter worked to serve in his role as administrator here at Stanford. People wanted to go back in order to set themselves up with the degree that would allow them to go into another job. This included people who were looking to stay in a similar discipline but thought it would be easier than trying to switch within a company, as in the case of Rebecca, or people who wanted to get a job in a completely new field, as in the case of Layla.
2. **Learning something new:** Others mentioned that learning something new was something that motivated them to return to school. This includes Sam, who, as a retired engineer, saw his new school as a way to scratch an itch that maybe he wasn't able to do as much in his previous career.

Issues

There were a couple of things that people dealing directly with the space noted as potential concerns that had come up, which we'll term "pain points." These pain points include:

1. **Time Management:** The most common theme that we saw was that older students had concerns about their ability to balance schoolwork with their other responsibilities and considerations. This came up throughout pretty much every interview that we did, from Peter mentioning it from the administrative standpoint as such as Layla and Monica, who both expressed hesitations and issues with

balancing their work and family responsibilities, or even simply in terms of looking after their mental and social health, as Rebecca mentioned.

2. **Connection and Support:** Another common theme that we saw was that older students felt like they were out of place socially with their peers. Some of that was related to an age difference between them and their younger peers, as Monica mentioned. However, a more pertinent problem was the fact that because older students were more likely to be working online, they had no avenue to meet fellow students taking the same classes. This not only impacted their feelings of connectedness with the school socially, but also academically, since they could not ask other students questions about material in their classes or create study groups with classmates, something that Sam explicitly mentioned he really enjoyed about taking classes full-time in comparison to some of his other colleagues going back to work part-time.

Example of an Empathy Map:

POVs and Experience Prototypes

POV 1

We met Sam, a retired engineer and sales associate who is currently studying to complete his Masters in Liberal Arts at Stanford. **We were surprised to notice** that this year he genuinely felt as if he was connected to Stanford once he started interacting with the student body more by coming to classes in the daytime. **We wonder if this means** that older students want to feel connected in some sense to the institution that they're learning from, not just that they want a degree. **It would be game-changing** to create an environment where older students don't have to literally be on campus during school hours to feel like they are part of a learning community.

How might we…

1. HMW leverages classmates located in nearby areas to reduce stress and improve academic success?
2. HMW make Sam feel more comfortable about his return to school?
3. HMW remove the stigma/judgment around returning adult students?

POV 2

We met Jake, an administrator in academic programs at Stanford. **We were surprised to** learn that the biggest challenges he noticed had more-so to do with the various types of adult learners rather than the types of technology being used. **We wonder if this means** he believes that improving adults' individual skill sets should be prioritized over improving technology. **It would be game-changing** to tailor academic programs to the specific skills and needs of each adult learner. It would be game changing to tailor academic programs to the specific skills and needs of each adult learner.

How might we…

1. HMW empower adults returning to school from the workforce to build and sustain lifelong connections with their classmates?
2. HMW make it easier to maintain some sort of work-life balance?
3. HMW create a more open environment where students are empowered to share their struggles and receive support from other students?

POV 3

We met Layla, a full-time Bank of America employee who returned to school in the Bay Area to study nursing. **We were surprised to notice** that while she appreciated the usefulness that technology provided, she thought it didn't completely provide an adequate replacement to in-person college education. **We wonder if this means** older students learn better with something resembling an in-person education in some capacity. **It would be game-changing** to give older students some form of an in-person education system even within the online options that so many prefer.

How might we…

1. HMW leverages classmates located in nearby areas to reduce stress and improve academic success?
2. HMW help students find the necessary study materials for lectures/exams to help manage the fast paced learning environment?
3. HMW help returning students with other responsibilities fit in 15-20 hours of work into their schedule?

Top 3 Solutions

We picked the top three solutions from our generated HMW's:

1. What if we institute a cross-university program that uses partnerships to give students access to more resources across degree programs?
2. Interactive game with the goal to connect with as many different people as possible and receive weekly challenges to connect with specific people each week, and every new connection gets added to the user's list of friends for future communication?
3. What if we institute a platform where students can find and create local support groups to stay on top of work, share their experiences and inspirations, and find community within school?
4. What if we make an app that allows students to complete school work on the go by recording their answers and converting from audio to text?

Note: Our team changed project ideas after A4, therefore we did not design experience prototypes for the fourth solution.

Experience Prototypes

Solution 1:

What if we institute a cross-university program that uses partnerships to give students access to more resources across degree programs?

Critical Assumption: Older students who are taking classes virtually still value access to in-person support resources like tutoring, constant feedback from instructors, and group work.

Prototype Setup: Surveyed older students about their experiences taking online courses and asked the following questions:

- What was the most difficult online class you've taken?
- What did you like about taking that class online?
- What did you dislike about taking that class online?
- What kind of interactions did you have with your professor & office hours?
- Imagine there was a nearby school that offered resources specific to that course. Would that have helped you? Explain why or why not.
- Would you utilize services like in-person tutoring and group work sessions at a nearby school for that class?

Participants: Adults students around and GSB school

Results/Insights: Our qualitative data shows that students appreciate “flexibility”, “organized videos” and “high-quality images”. Participants also stated they dislike "not having live interaction” with professors and other students and also dislike lack of space for discussions because it is “not easy to connect”. From our results, 67% said they might have or would have reached out to a nearby school that offered in-person resources to help with their class 89% of participants said they might have or would have utilized the in person tutoring / group work sessions.

Solution 2:

Interactive game with the goal to connect with as many different people as possible and receive weekly challenges to connect with specific people each week, and every new connection gets added to the user’s list of friends for future communication.

Critical Assumption: Older students see value in connecting with other students regardless of if they are taking the same courses.

Prototype Setup: Task students with going up to someone new, introducing themselves, and finding things they have in common. Ask them to get to know each other and find two similarities. We observed behaviors and debriefs, participants filling out a survey form about their experience.

Participants: Graduates (GSB) who do not know each other.

Results/Insights: People were open and willing to go up to a stranger! Generally found it interesting to meet someone new. Some participants looked more excited

than others. When we asked, no participant felt that the experience worsened their day.

Solution 3: What if we institute a platform where students can find and create local support groups to stay on top of work, share their experiences and inspirations, and find community within school?

Critical Assumption: Older students feel motivated and supported when they can share their goals and progress with others.

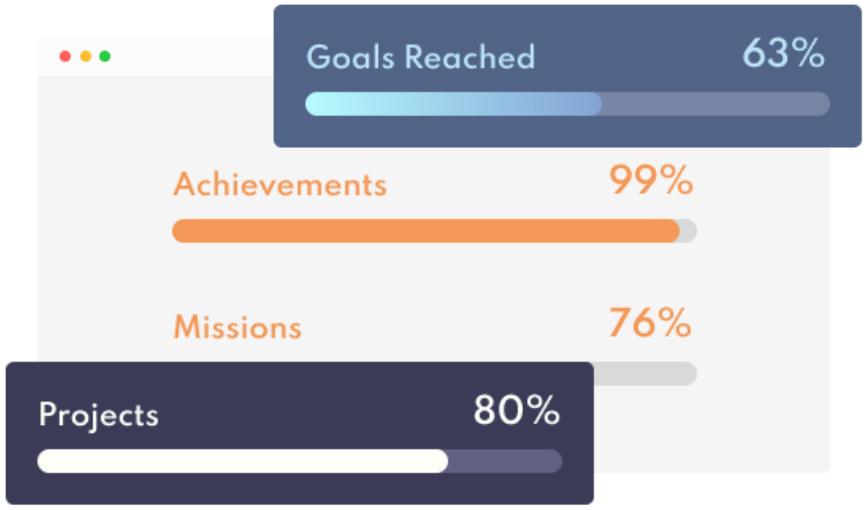
Prototype Experience: Show students photos of progress bars and …

- Ask them how they would feel about it, knowing it was a classmate of theirs?
- How comfortable do you feel sharing your goals and progress with others?
- Do you like sharing your goals with others as a form of motivation?
- Do you find it motivating to work towards a goal with others?
- What effects does seeing others' progress bars have on you?

Participants: Graduates (GSB) and students around tressider.

Results/Insights: Adult students generally find it motivating to work towards their goals with others, enjoy having the progress bar to see their progress but not the progress of their peers, and like to share their progress/goals as a form of motivation.

Example Of Progress Bar



Design Evolution

Final Solution

Our final solution is grounded in StudAudio, where we are allowing users to school on the go. With StudAudio, we are tackling many of the pain points that were brought up during our needfinding process.

To reiterate, some of the pain points are:

- Struggles with time management (work, other responsibilities, and school)
- External stress from work and school (too many responsibilities is overwhelming)
- Lack of connection with other students (feeling alone or out of place at school)

Description

A platform that allows older adult students returning to school to manage their time, responsibilities, and education better. Aside from allowing users to school on the go, we added an additional feature that allows users to make new friends through the platform by connecting with students taking similar classes.

Target Audience

Our solution app targets older adult students returning to school.

Who might be left out

Users who are not tech savvy at all, users who are hard of hearing.

Ethical Implications

Privacy concerns regarding what we do with their collected information, voice audios. Some other implications can be if a bad actor decides to use the connection feature to stalk other users.

Tasks

Simple Task

Our simple task is to have a user submit an assignment through the app. We labeled this as our simple task because we believe that being able to do this task is the most essential function of the app. More specifically, a lot of time in classes is spent on assignments and homework that typically requires one to be in front of a computer. Being able to do such an active function solely through audio would be really important in establishing the use of this app as a way to do classes “on-the-go”.

Moderate Task

Our moderate task is to have users upload readings and listen to them as if they are podcasts.This task brings value to the user because give users flexibility to complete their assigned readings anywhere they are. It allows for them to take advantage of any time in their busy schedule to make progress towards their educational goals.

Complex Task

Our complex task is to have users take quick audio notes, which are then transcribed in real time to be used later for reference, as well as have the ability to share these notes with others. We chose this task to be our complex because it is also a leeway into providing users a chance for connecting with other students and finding those support groups to enhance their learning experience.

Design Evolution Visualizations(s) and rationale

1. Mobile App, Augmented Reality, and Wearable Realizations

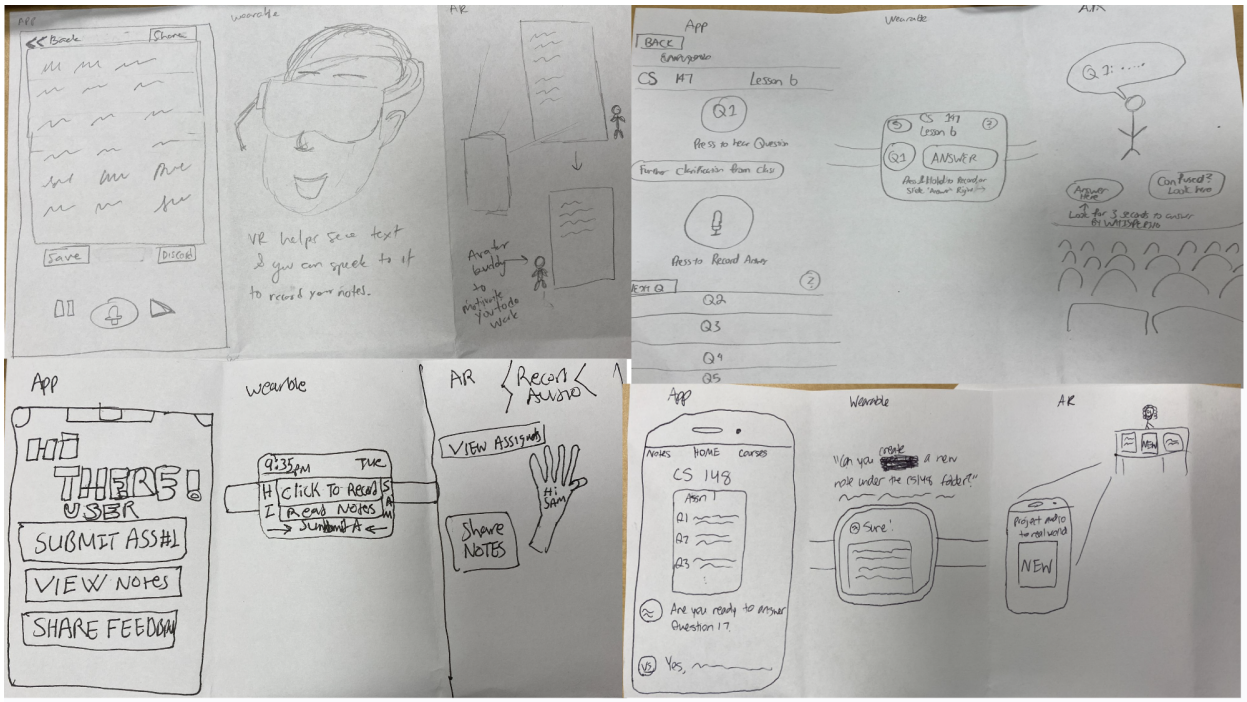


Figure 1. This figure shows each of our team members' realizations split into 3 boxes. Left most is an app, the middle is a wearable device, and rightmost is an AR realization.

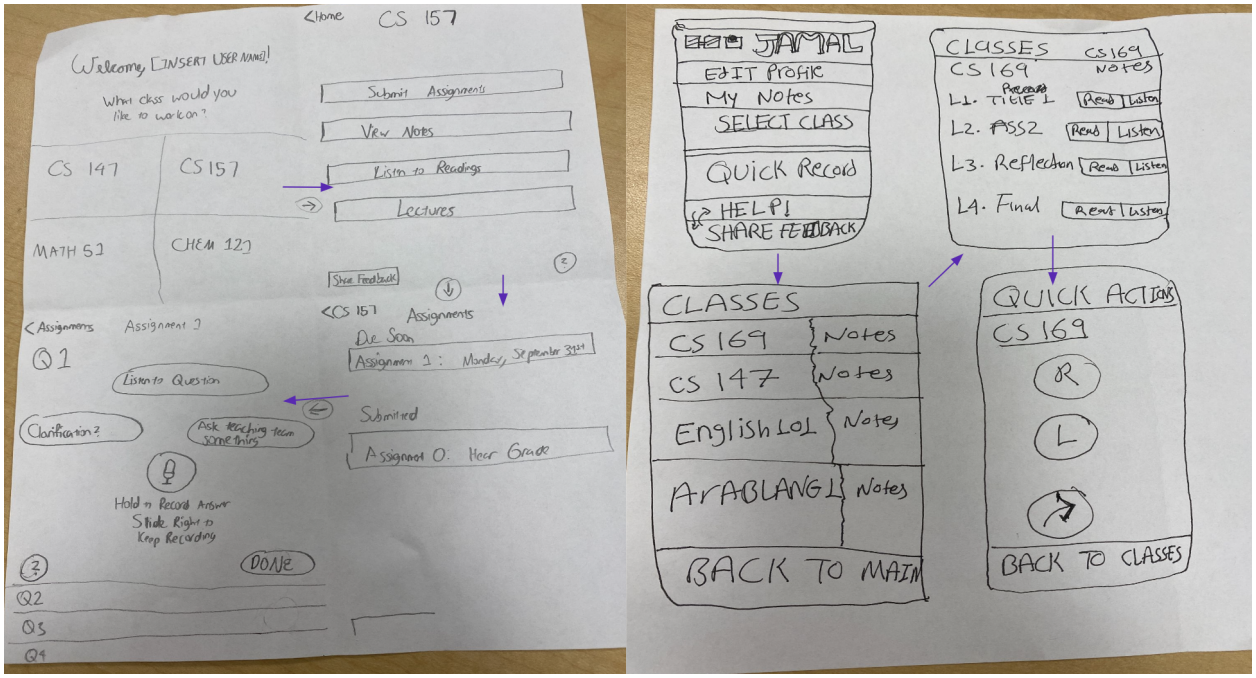


Figure 2. A more indepth realization of a mobile app. These sketches contain ideas for homescreen and what later becomes our simple task.

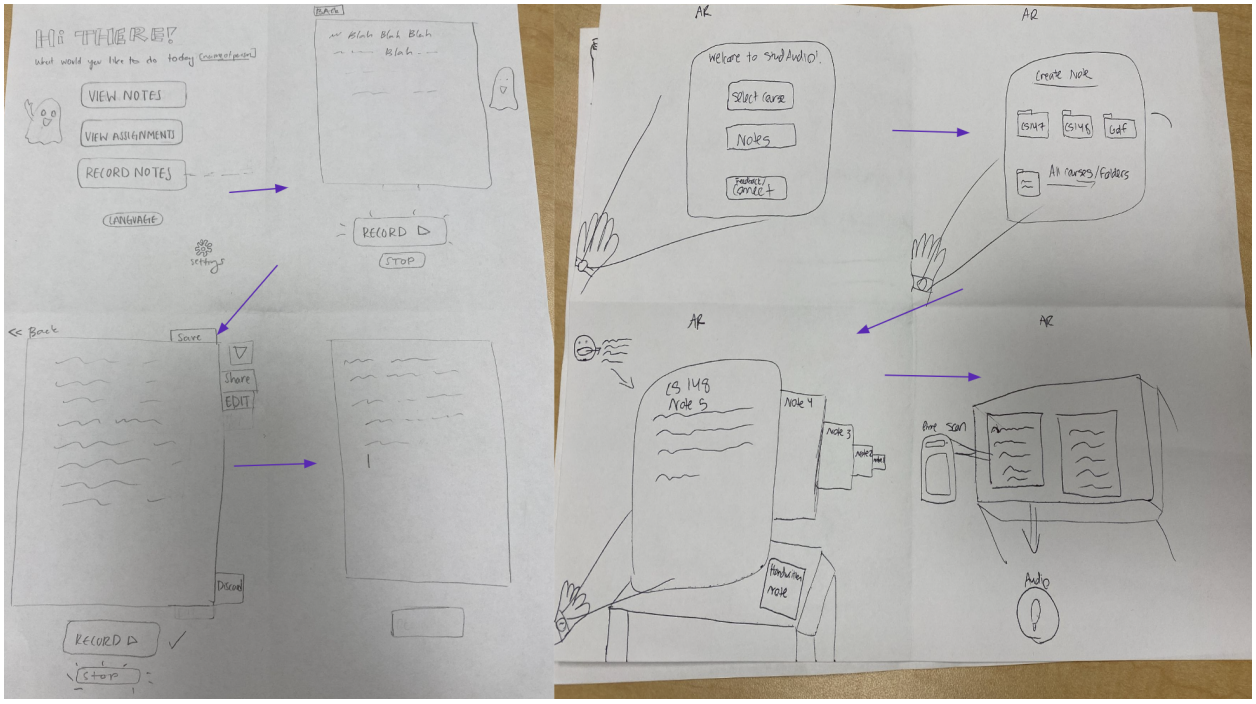


Figure 3. These screens are more in depth AR realizations. You can see that the left sketch shows the idea for transcribing text to speech and vice versa, one of our main ideas for our app solution.

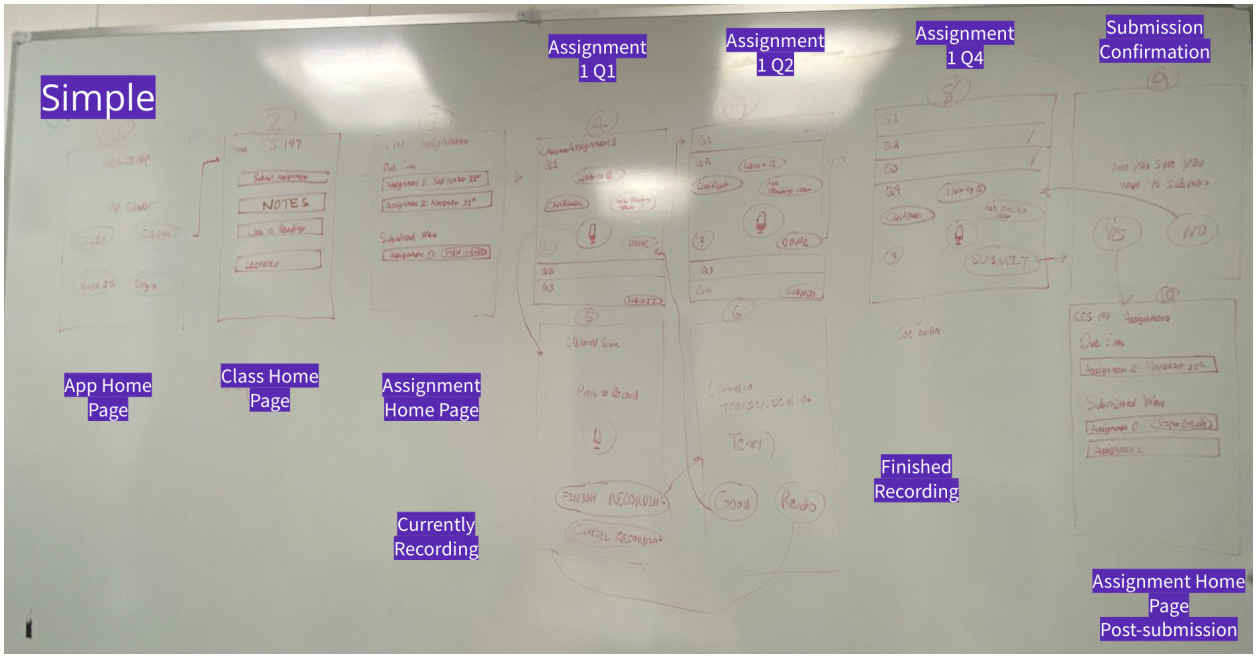


Figure 4. Initial storyboard of our simple task flow.

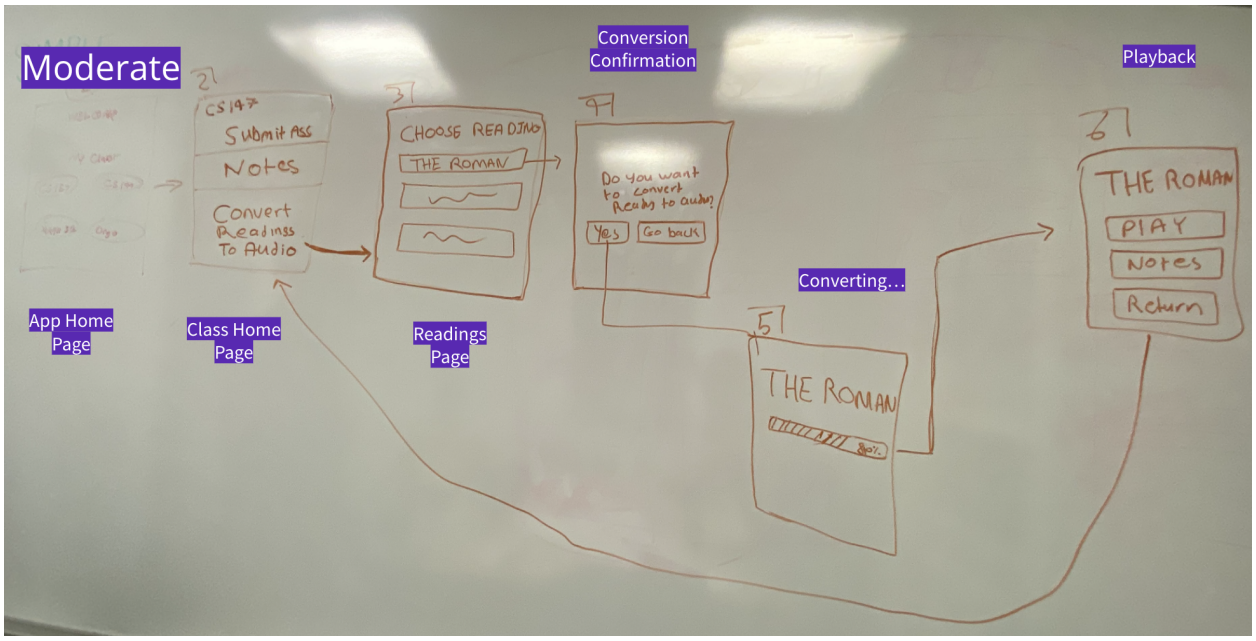


Figure 5. Initial storyboard of our moderate task flow.

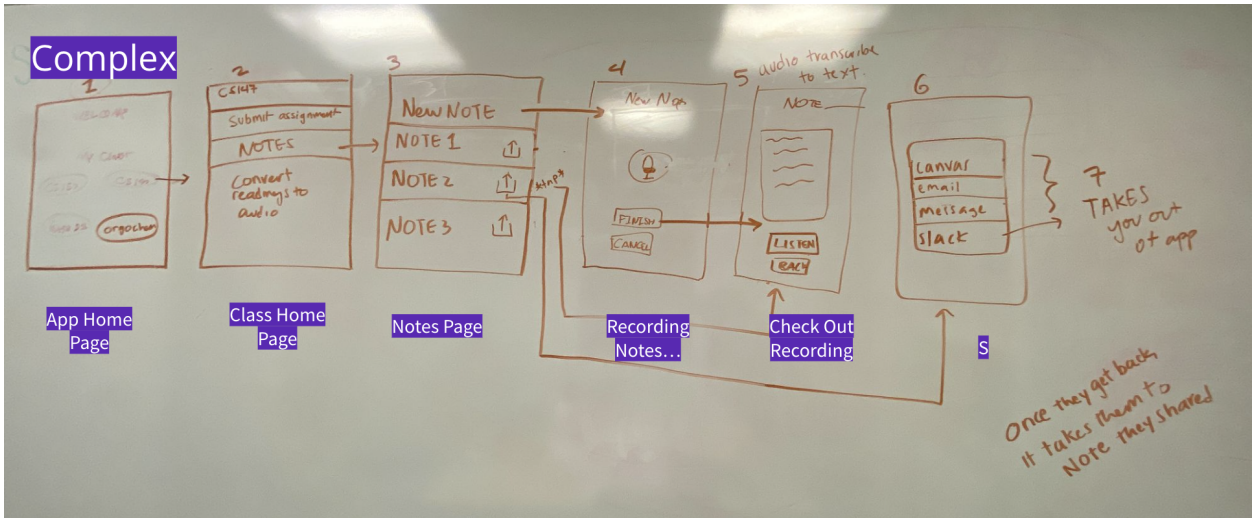


Figure 6. Initial storyboard of our complex task flow.

Low-Fidelity Prototype

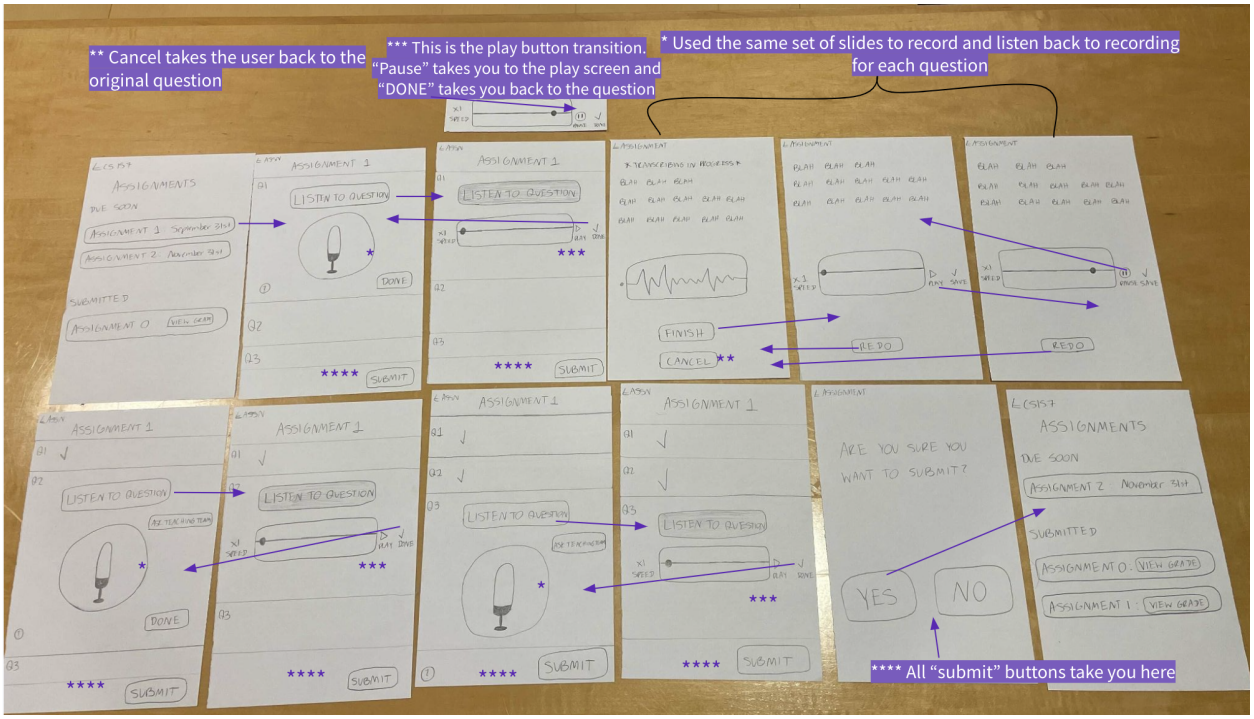


Figure 7. Our low-fidelity prototype for the simple task that we made to use for usability testing.

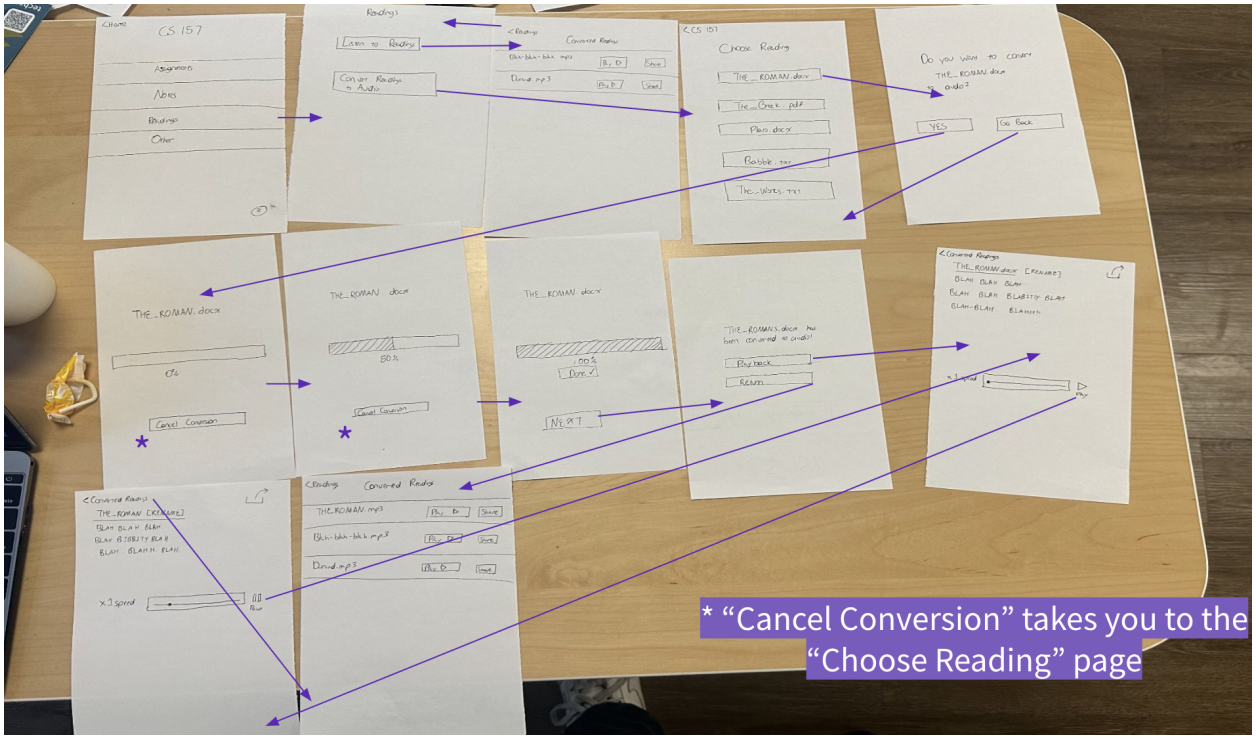


Figure 8. Our low-fidelity prototype for the moderate task that we made to use for usability testing.

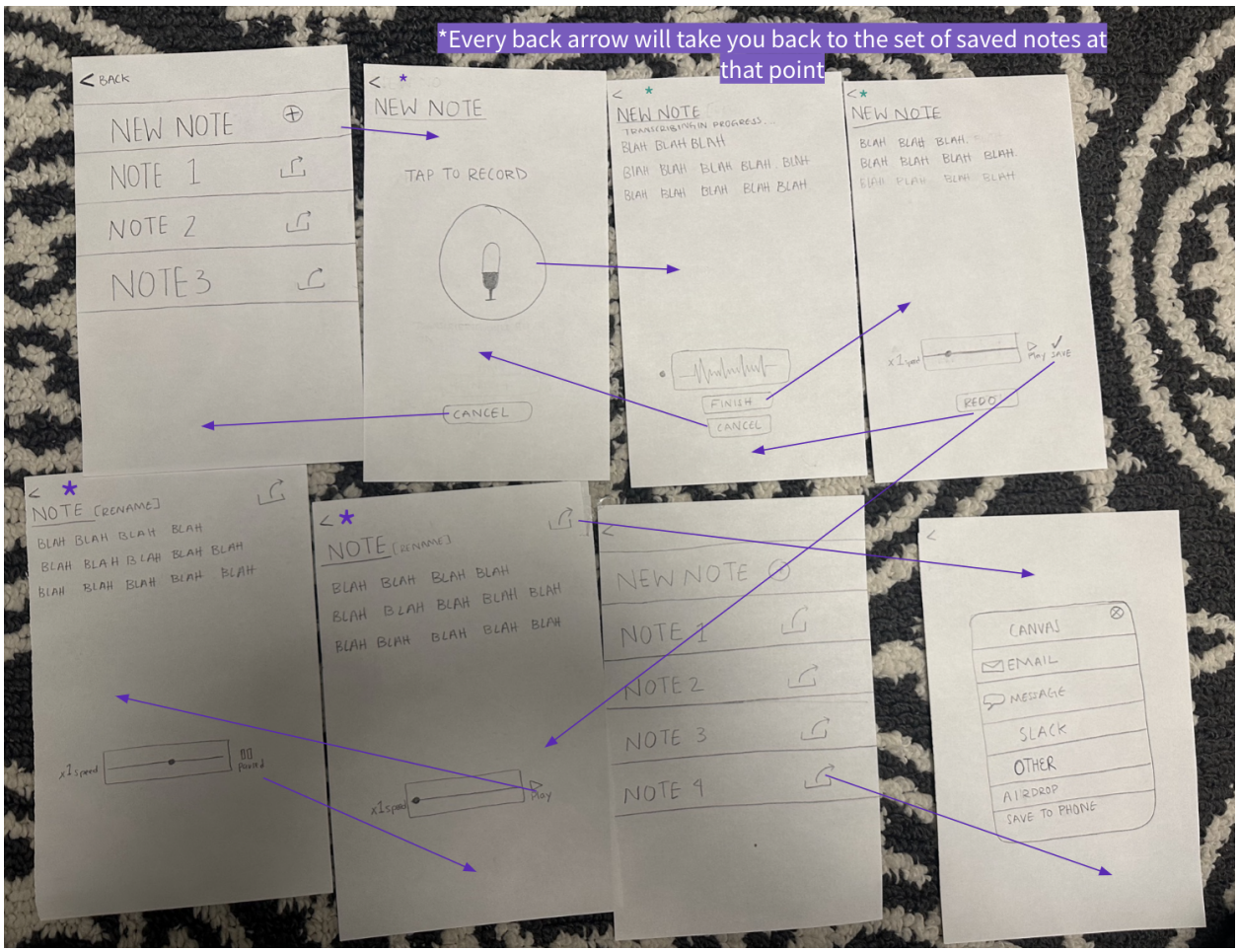


Figure 9. Our low-fidelity prototype for the complex task that we made to use for usability testing.

Usability Testing

Figure 10. Testing location: Foothill Community College.

Participants

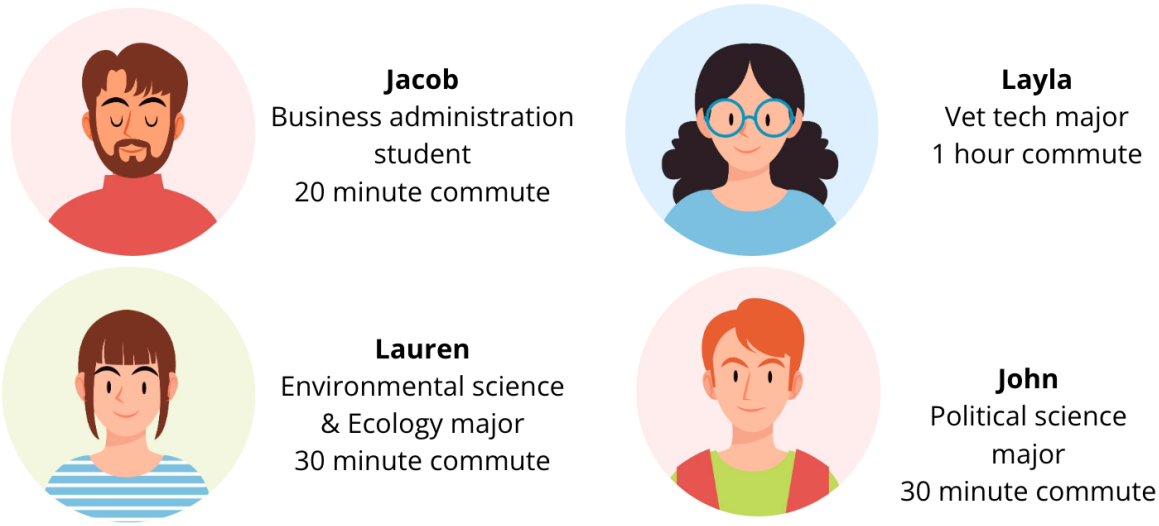


Figure 11. Here are the participants from Foothill Community College who tested our low-fidelity prototype.

Testing Methodology

- Think-Aloud Testing
    - Encourage users to verbalize their thoughts and actions as they interact with the low-fidelity prototype. This helps you understand their decision-making processes

and uncover usability issues

- Qualitative Feedback
    - Gather qualitative feedback from users about their overall impressions, expectations, and any pain points they encounter while interacting with the low-fi prototype. Open-ended questions can provide valuable insights.

Testing Procedure

- Ask students if they are willing to join, briefly **preface the project** and class, ask for **consent** to participate and record.
- Briefly outline the experiment and prototype, emphasize to them to **speak out loud as they go through the prototype** and reassure them that this is not a test.
- Ask participants to **perform each task** and then return to the home screen.
    - **Simple**: Please submit Assignment 1 in CS 157.
    - **Moderate**: Convert the reading titled “The Roman” in CS157 into an audio file and listen to it.
    - **Complex**: Create a new note and attempt to share it.
- After all 3 tasks are completed, ask participants for **feedback** on what they liked and didn’t like, and anything else they want to know, thank them for participation and time.

Usability Goals

- Consistency - Reduce cognitive load with consistency in design and interaction patterns to help users predict how the product works.
- Learnability - Intuitive design, clear instructions, and minimal learning curve contribute to high learnability.
- Efficiency - Faster task completion and fewer steps or clicks are indicators of higher efficiency.
- Value - How useful it would be to have an app like this in the market.

Key Measurements

- **Task Completion Time**: This measurement evaluates the time it takes for users to complete a task, and faster task completion times often indicate higher efficiency.
- **Error Rate**: The error rate quantifies the number of errors users make while performing tasks. We observed to distinguish minor vs major errors, where major errors need to be corrected.
- **Task Success and Failure**: this measurement categorizes users' task outcomes as successful, partially successful, or failed. Partial success may involve users completing

the task but encountering difficulties along the way.

- **Task Completion Path**: Analyzing the path users take to complete a task can reveal where they encounter challenges or confusion. This information can help improve task flow and navigation.
- **Time on Task**: Time on task measures the amount of time users spend on a specific task. We observed if prolonged task durations may indicate usability issues.

Results

From this usability test, we observe that for all of the four participants, the complex task was really easy to complete within less than a minute. Generally, participants had some confusion about the meanings of buttons (i.e. if buttons did similar things). Moreover, most participants shared that the process of completing simple task 1 was long in comparison to the other tasks. Similarly, 2 Participants were confused about how to find readings (whether to read or view) pressed buttons back to back, and not understanding they needed to wait between presses. This let us know that this was a usability issue on our end that we would need to improve in our medium-fidelity prototype. Some additional feedback that a participant suggested was that the share button should be placed in a more visible location, and assignment questions should be available in text to read, not just audio. Moreover, they also suggested the option to edit the transcribed note, in the case that it contains typos from what was said to it.

Bottom-Line Data

- Average time spent per task
  - Simple Task: 4 minutes
  - Moderate Task: 2 minutes
  - Complex Task: 2 minutes
- 2 “incorrect” clicks (button not leading to expected page)
- 2 double-clicks (back-to-back presses without wait)
- 1 mis-click (pressed wrong button accidentally)

Medium-Fidelity

Key Changes

Some changes we made from the low-fidelity prototype to our medium-fidelity prototype was the simple task outline. In our medium-fi prototype, we include assignments, assignments due soon, and give cues to users as to which assignments to prioritize. We added colors to the homescreen to make it more attractive to users, however this design feature was later removed in our high-fidelity prototype, which we will get into more detail later.

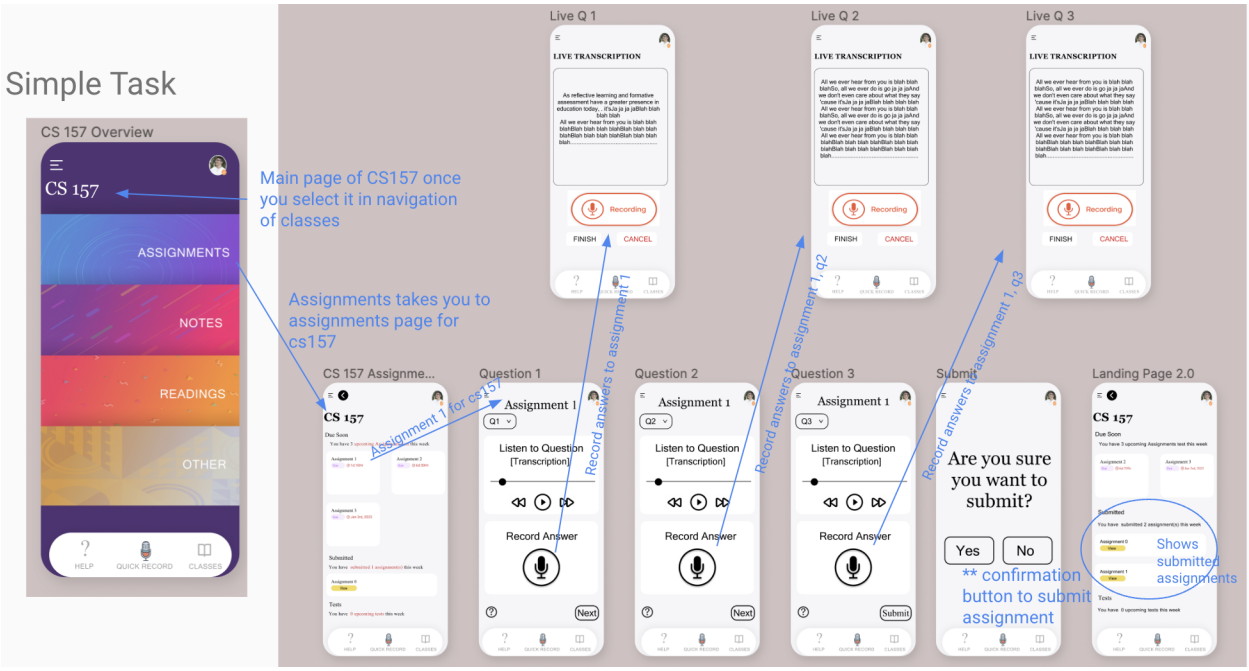


Figure 12. Shows the simple task from our medium-fi prototype. This shows the process of the user going to the “assignments” screen, where they record and submit verbal responses to the course assignments.

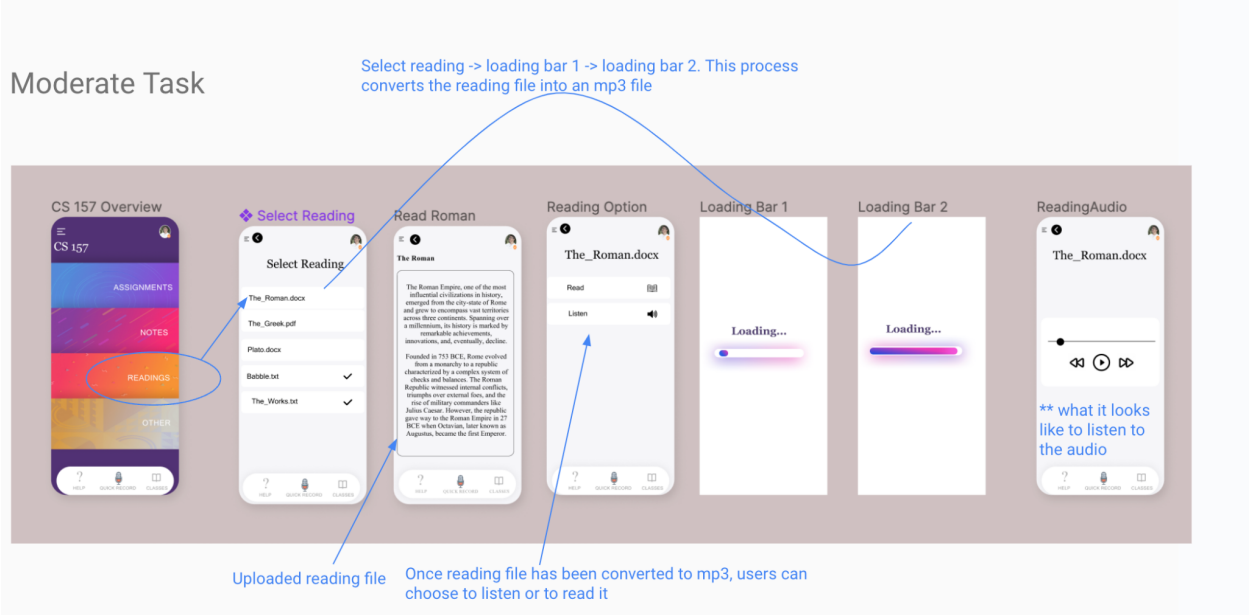


Figure 13. Shows the moderate task from our medium-fi prototype. Task flow is made to show the process of selecting "readings" button from the homescreen, and selecting a reading to listen to, which is then converted to an audio.

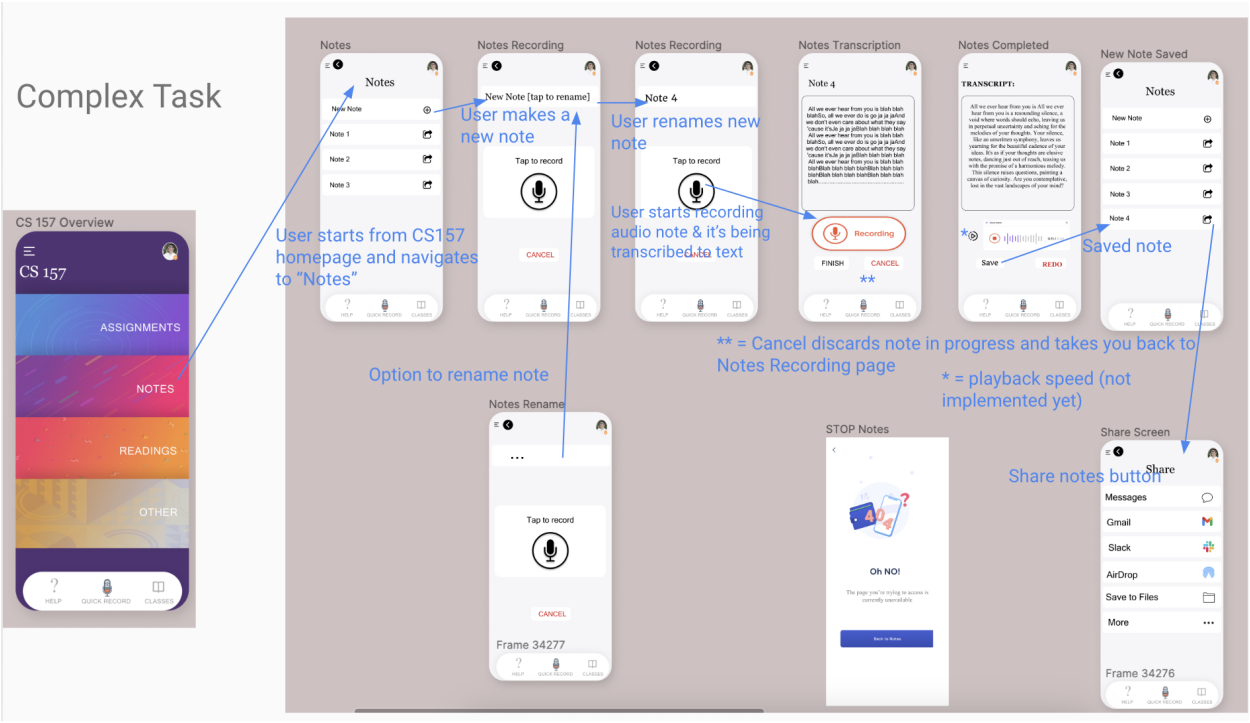


Figure 14. Shows the complex task from our medium-fi prototype. This shows how users can navigate to the "notes" page, where they can create a new note, speak into their phone and have their words be transcribed in real time. Users can redo the note or save it and share it with contacts.

High-Fidelity

As we moved into our high-fidelity, we ran our medium-fidelity prototype by a group of heuristic evaluators, who provided us with feedback for areas of growth.

Summary of Violations

Category	# Viol. (sev 0)	# Viol. (sev 1)	# Viol. (sev 2)	# Viol. (sev 3)	# Viol. (sev 4)	# Viol. (total)
H1: Visibility of Status	0	0	4	1	0	5
H2: Match Sys & World	0	1	0	0	1	2
H3: User Control	0	1	1	0	0	2
H4: Consistency & Standards	0	5	2	1	0	8
H5: Error Prevention	0	1	1	1	0	3
H6: Recognition not Recall	0	0	2	0	0	2
H7: Efficiency of Use	0	0	4	0	0	4
H8: Minimalist Design	0	5	0	0	0	5
H9: Help Users with Errors	0	0	0	0	0	0
H10: Help & Documentation	0	0	0	0	0	0
H11: Accessible	0	1	0	2	2	5
H12: Value Alignment & Inclusion	0	0	0	1	0	1
Total Violations by Severity	0	14	14	6	3	37

36
total violations

Figure 15. StudAudio had repeated violation (#33 and #34) so we went with a total of 36.

Summary of Violations

Category	# Viol. (sev 0)	# Viol. (sev 1)	# Viol. (sev 2)	# Viol. (sev 3)	# Viol. (sev 4)	# Viol. (total)
H1: Visibility of Status	0	0	4	1	0	5
H2: Match Sys & World	0	1	0	0	1	2
H3: User Control	0	1	1	0	0	2
H4: Consistency & Standards	0	5	2	1	0	8
H5: Error Prevention	0	1	1	1	0	3
H6: Recognition not Recall	0	0	2	0	0	2
H7: Efficiency of Use	0	0	4	0	0	4
H8: Minimalist Design	0	5	0	0	0	5
H9: Help Users with Errors	0	0	0	0	0	0
H10: Help & Documentation	0	0	0	0	0	0
H11: Accessible	0	1	0	2	2	5
H12: Value Alignment & Inclusion	0	0	0	1	0	1
Total Violations by Severity	0	14	14	6	3	37

22%
H4 violations

Figure 16. Total of 8 H4 violations for consistency standards, which made up 22% of our violations.

Summary of Violations

Category	# Viol. (sev 0)	# Viol. (sev 1)	# Viol. (sev 2)	# Viol. (sev 3)	# Viol. (sev 4)	# Viol. (total)
H1: Visibility of Status	0	0	4	1	0	5
H2: Match Sys & World	0	1	0	0	1	2
H3: User Control	0	1	1	0	0	2
H4: Consistency & Standards	0	5	2	1	0	8
H5: Error Prevention	0	1	1	1	0	3
H6: Recognition not Recall	0	0	2	0	0	2
H7: Efficiency of Use	0	0	4	0	0	4
H8: Minimalist Design	0	5	0	0	0	5
H9: Help Users with Errors	0	0	0	0	0	0
H10: Help & Documentation	0	0	0	0	0	0
H11: Accessible	0	1	0	2	2	5
H12: Value Alignment & Inclusion	0	0	0	1	0	1
Total Violations by Severity	0	14	14	6	3	37

8

severe violations

Figure 17. Total of 8 severe violations of ratings 3 and 4.

Themes in Feedback

1. Consistency - This is for aesthetics and text sizes. We needed to have consistent fonts and make the aesthetic consistent throughout tasks. Moreover, the buttons should be aligned in each of our screens.
2. Clarity - provide buttons that allow users to switch between screens. Reconsider colors in task 1 to make it less confusing to users what is due soon. Reformat layout task 1 as there is a lot going on from users POV.
3. Accessible Design - making text bigger and easier to view for others, and reconsider colors in task 1 (some are not accessible for everyone), and reformat the simple task layout because some buttons were too small and too much is going on.

Violations Severity 3

- H1 Visibility of System Status
    - Description: In Task 2, when looking at all the readings that have been transcribed, there is no indication of reading statuses such as “To-Do, in-Progress at time xx:xx, Due, etc”.
    - Solution: Given that the readings would be populated using data from Canvas, since Canvas does not track whether an assigned reading is in

progress, due, etc, we decided to stay consistent with this approach and not track these statuses.

- H4 Consistency & Standards
    - Description: Alignment of buttons and texts are inconsistent across screens.
    - Solution: Fixed to using consistent styling for fonts and texts, as well as for buttons across all screens.
- H5: Error Prevention
    - Description: User is only given “yes” or “no” choices to whether they want to submit an assignment
    - Solution: Still have a yes or no choice when submitting an assignment, but now ensures that the user can always exit the assignment by using the back buttons or using the bottom tab to navigate to different pages.
- H11. Accessible Design
    - Description: Overall throughout the Medium-Fidelity Prototype, there are some portions where the font is small and can be difficult for users who are visually impaired to read.
    - Solution: Increased font sizes throughout the app, with headers having the biggest font size and all other text smaller, but still readable
- H12 Value alignment and Inclusion
    - Description: Long process to submit an Assignment that makes a user have to read a lot of stuff.
    - Solution: Reduced the number of steps needed to save a question from three to two to ensure the process to submit an assignment is not too long and does not include unnecessary repetition, and reduced the number of questions in the prototype from 3 to 2 as well.

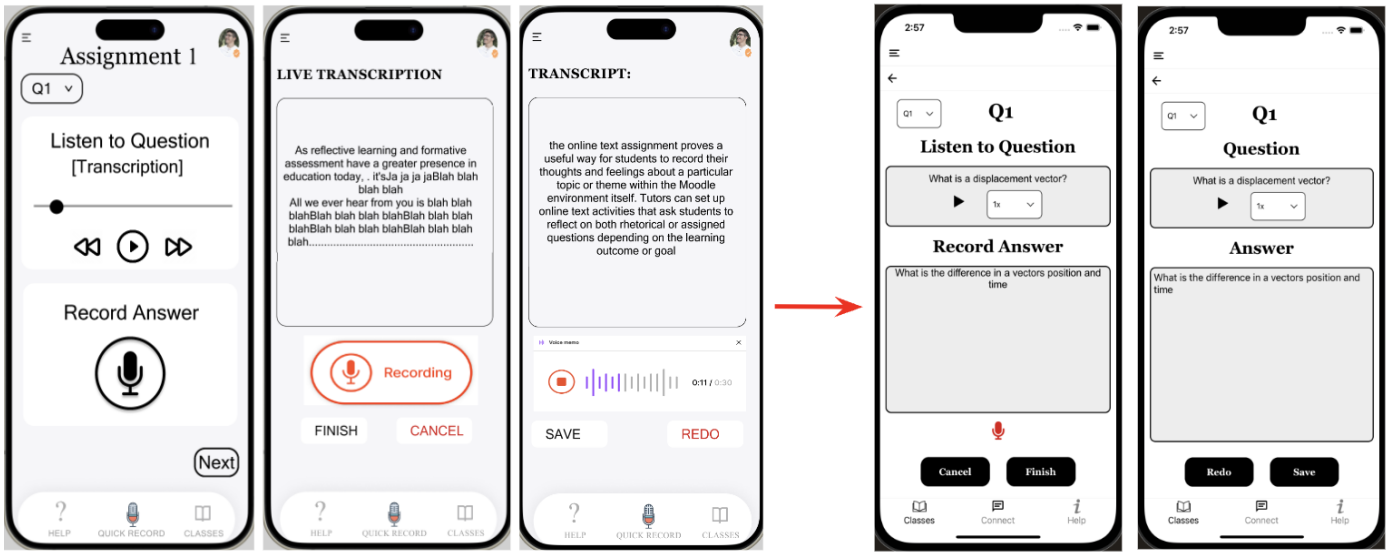


Figure 18. Submitting an assignment flow before and after heuristic evaluation. Reduced number of screens needed to save a question while still keeping functionality the same.

Violations Severity 4

- H2 Match between system and the real world
    - Description: The affirmative action buttons (Yes, Next, Submit) are on the left, and the dismissive action buttons (No, Cancel) are on the right.
    - Solution: Switched ordering so affirmative action buttons are on the right, and dismissive action buttons are on the left.

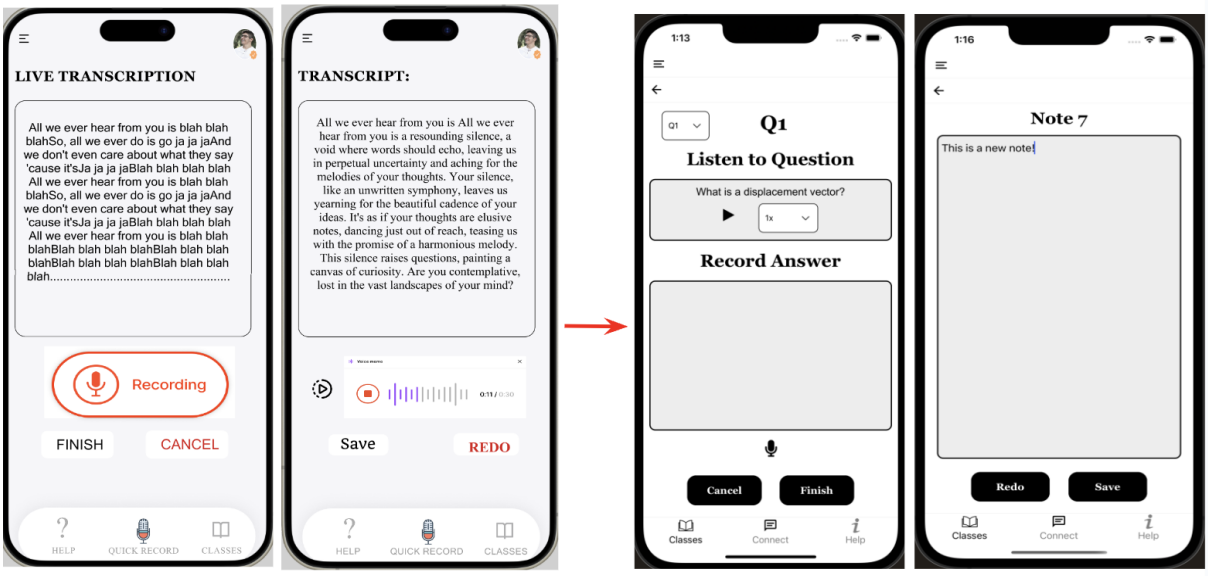


Figure 19. Affirmative and dismissive action buttons ordering and styling before and after heuristic evaluation.

- H11 Accessible Design
    - Description: There is no option to both read and listen to the audio at the same time.
    - Solution: Changed so that when selecting a specific reading, users can choose to read, listen, or read and listen simultaneously.

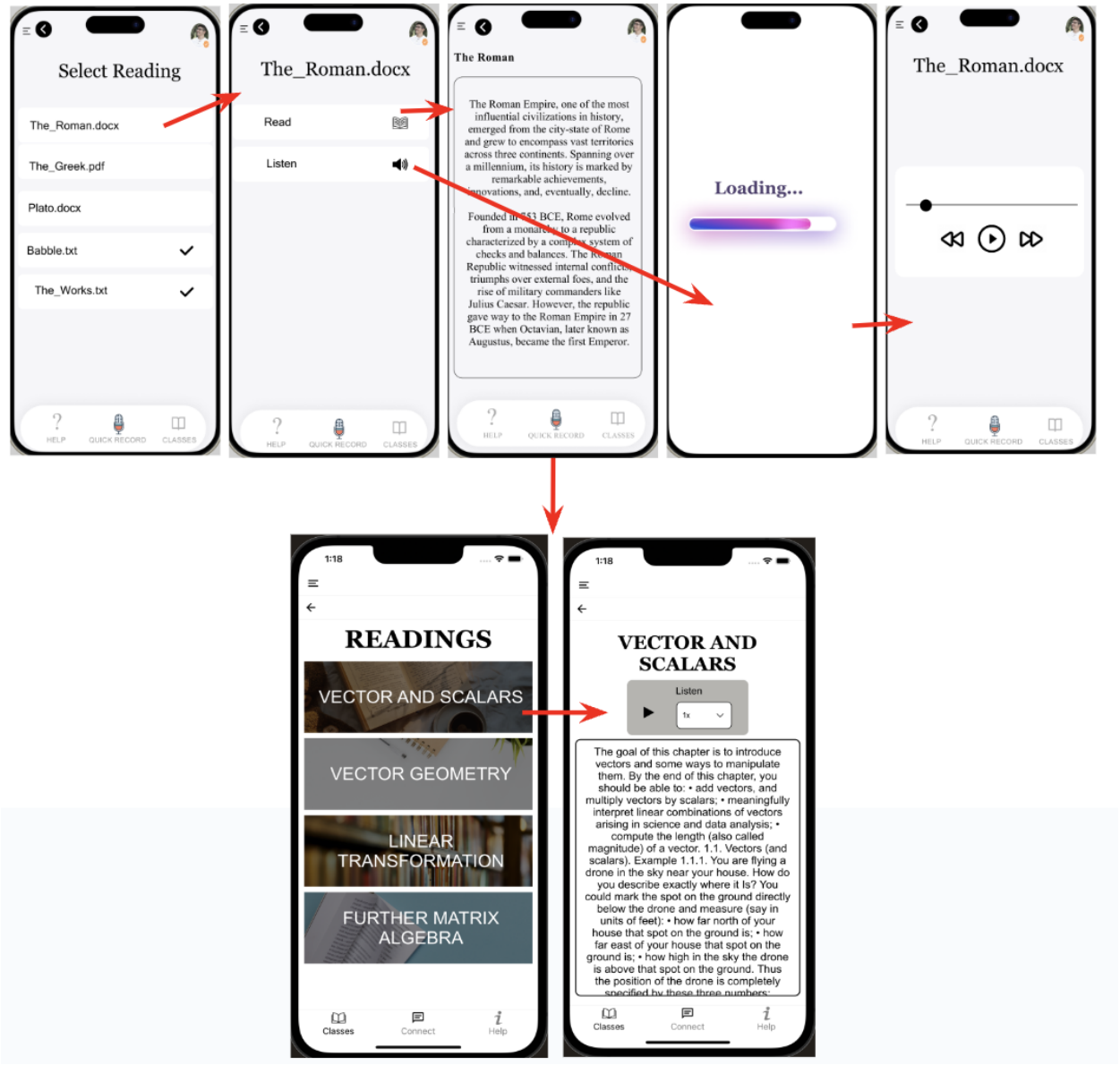


Figure 20. Flow for listening/reading a reading before and after heuristic evaluation. Significantly reduced the number of screens in the updated flow, and removed unnecessary loading screens. Combined the ability to listen and read into one page for added user flexibility.

- H11 Accessible Design
    - Description: The body text is quite small, including the due dates.
    - Solution: Increased the text size of the due dates, as well as with the remainder of the body text throughout all screens

Simple Task: Submitting an Assignment

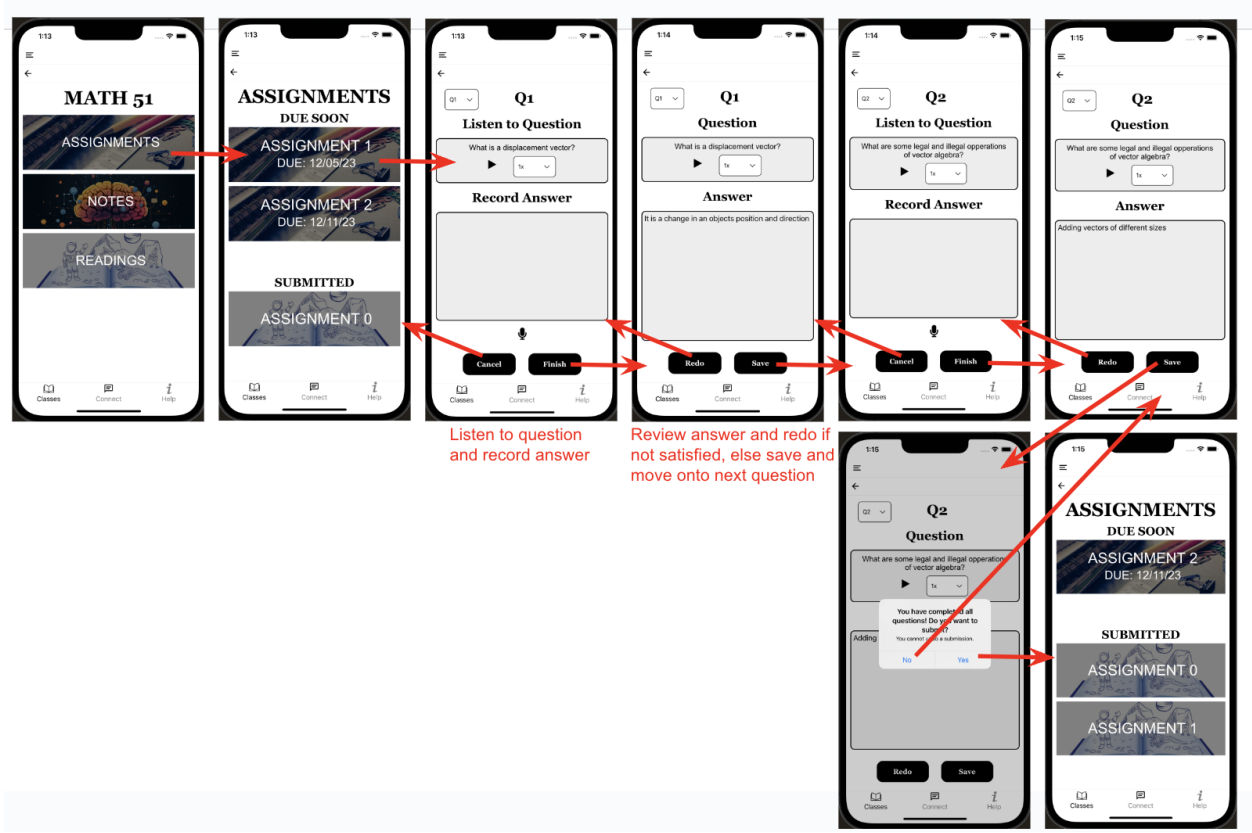


Figure 21. Submitting an assignment flow: This shows the process a user needs to take in order to submit an assignment. They have the option to read or listen to each question, and press the microphone button to record an answer. After recording an answer, the user has the option to redo the recording if they are not satisfied, or save their answer and move onto the next question. Once finished, the user can press “Yes” to submit the assignment or “No” to continue working on the assignment. This updated flow requires less screens to submit the assignment, increased the font sizes of the body and “Due” text, and uses the same style of buttons throughout.

Moderate Task: Listening to Readings

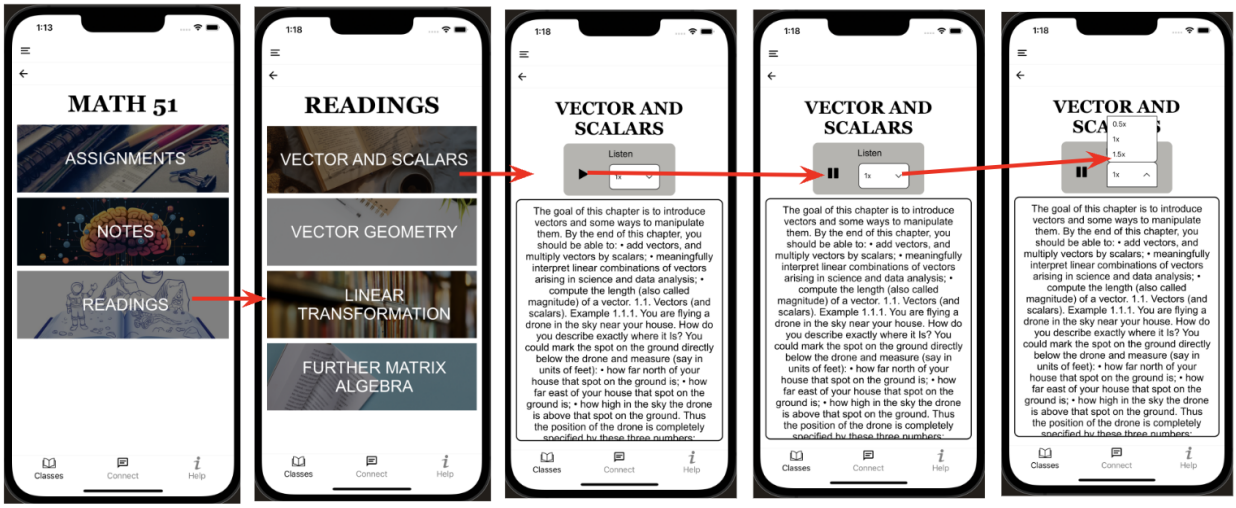


Figure 22. Listening to a reading flow: This shows the process a user needs to take in order to read or listen to a reading. After selecting the desired reading, the user is immediately presented with a “Listen” section at the top, where they can press the play button to listen to the reading aloud and adjust the speed with the dropdown bar. In addition, the user can also read the text underneath the “Listen” section, scrolling to view all the text. This updated flow allows the user to quickly listen to a reading without having to wait for it to be loaded into the app or separating the listening and reading components.

Complex Task: Create and Share Notes

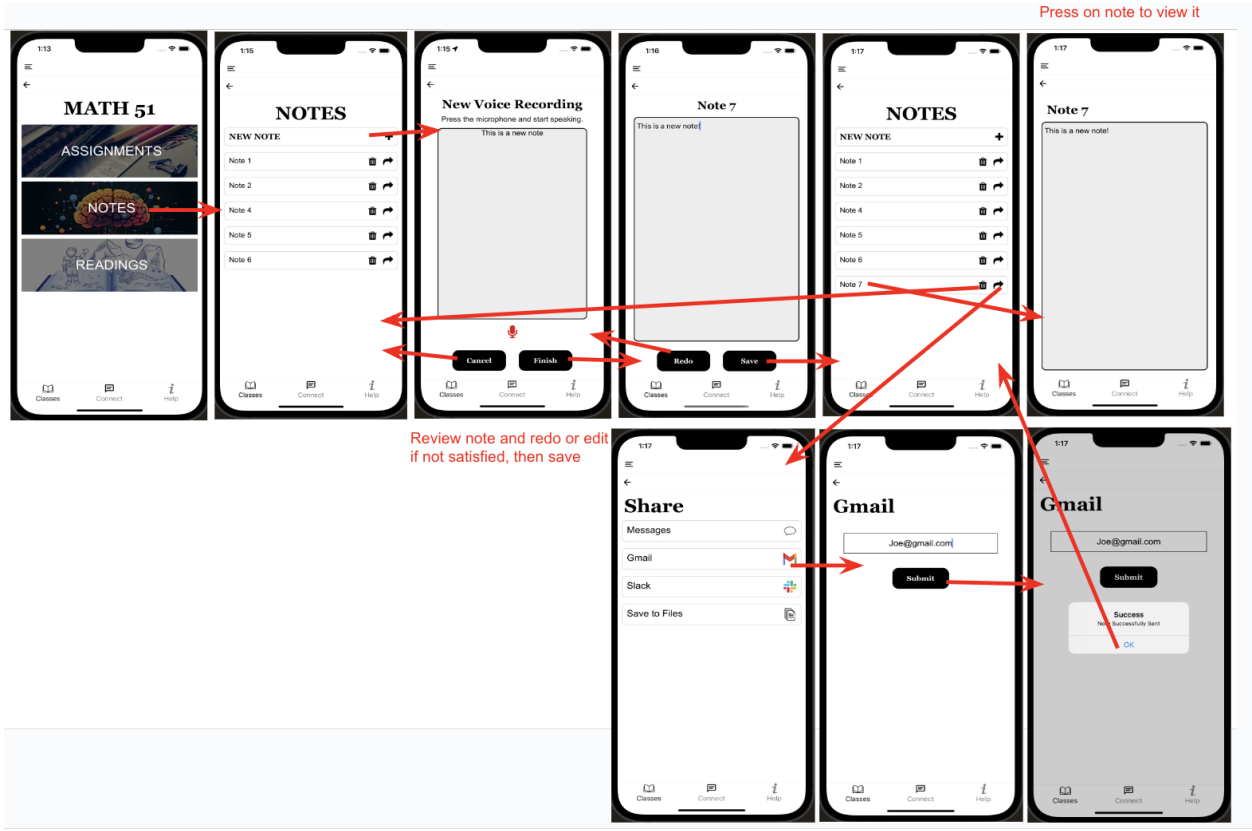


Figure 23. Creating and sharing note flow. Users can create a new note by pressing on the "New Note" row, and pressing on the microphone to record a note and saving it similarly to in the submit an assignment flow. The user can always view the note by clicking on the note name. This updated flow allows users to delete notes, as well as share it with others on a variety of platforms including Messages, Gmail, Slack, etc. This flow also allows users to edit the note name and content both when recording, and after saving, a desired feature after the heuristic evaluations.

Additional Screens

Sign In & Home Page

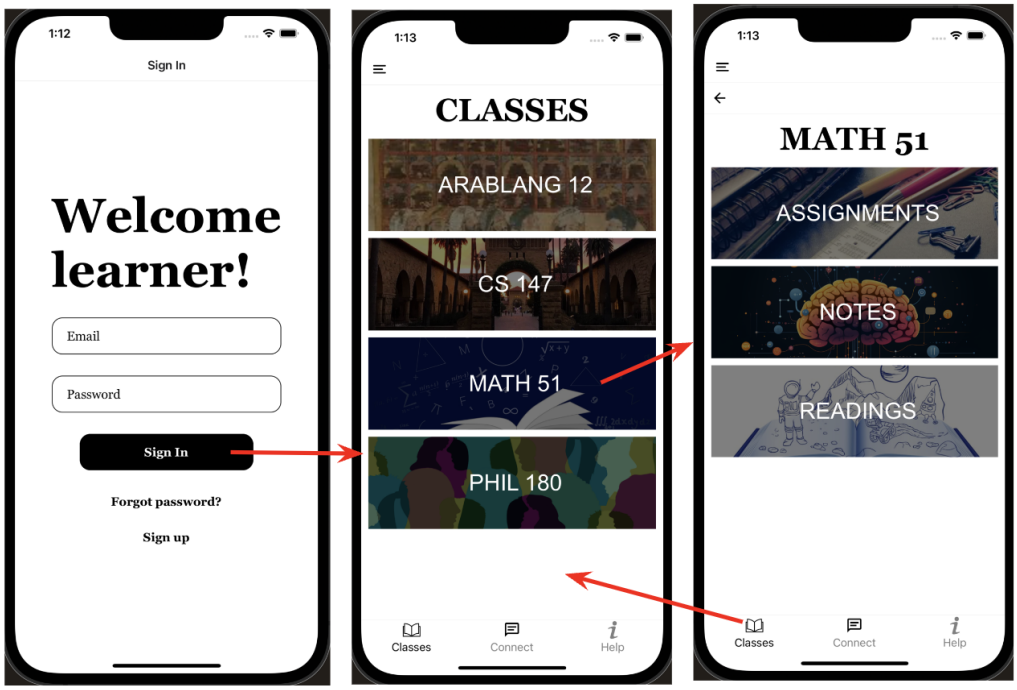


Figure 24. Sign In Screen leading into the homepage which lists all classes a user is currently taking. After pressing on a course, the user is presented with three options representing our three key tasks: assignments (submitting an assignment), notes (creating and sharing notes), and readings (listen/read).

Connect Screen

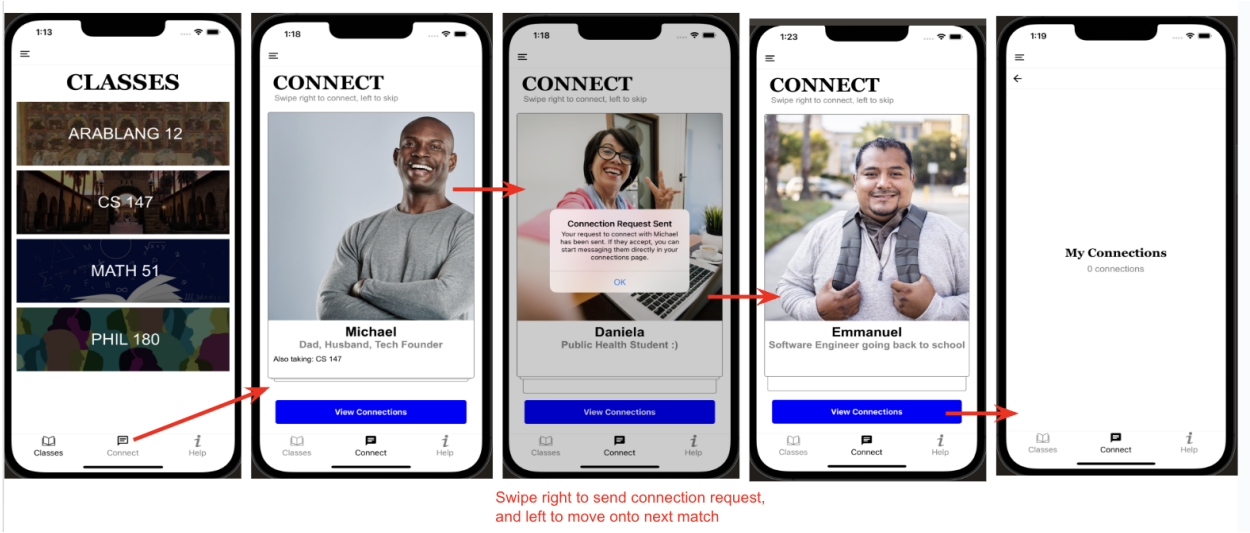


Figure 25. Connect Screen. In this page, the user is recommended with classmates who are also taking the same classes as them. The user can choose to swipe right, sending a connection

request, or swipe left and move onto the next match. This component allows the app to still target the strong social component that adult students returning to school may be yearning for but have not had the opportunity to explore.

FAQ Screen

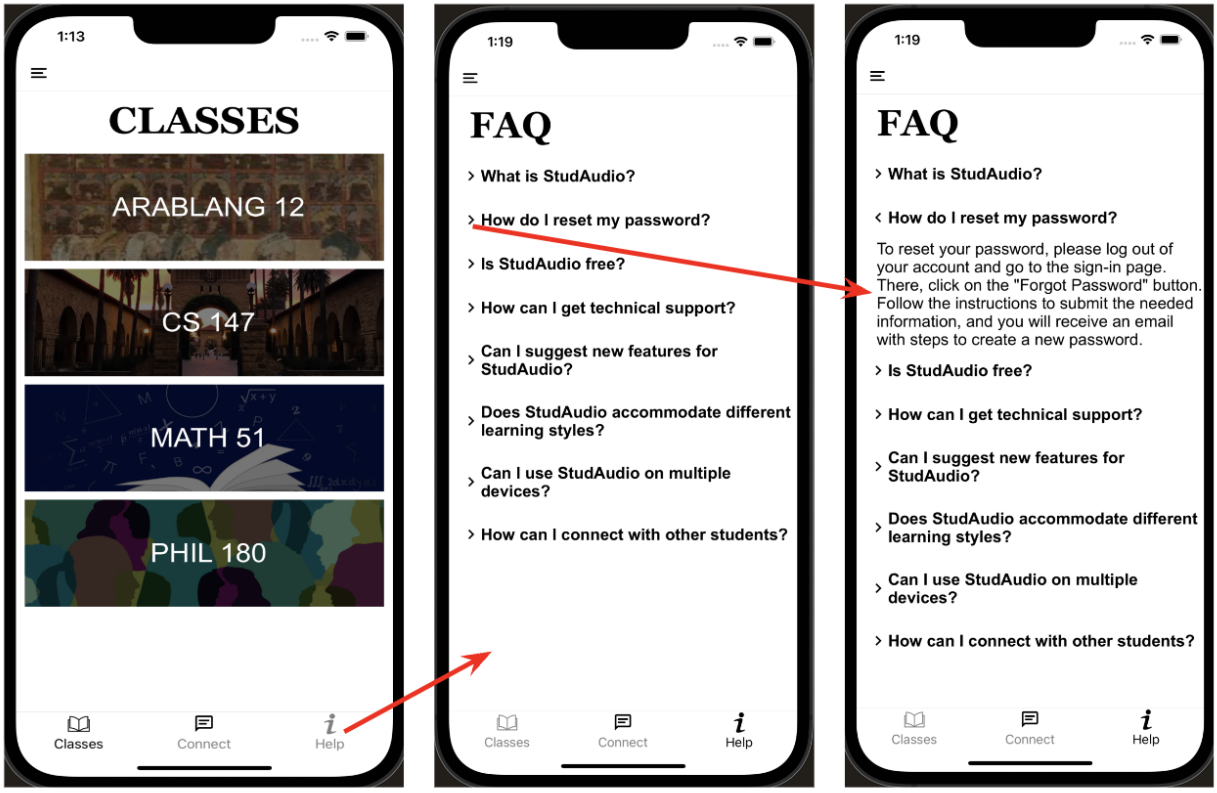


Figure 26. FAQ Page. This page contains frequently asked questions and answers to provide clarity for users on problems or aspects of the app they may be confused about.

Values in Design

1. **Workflow Efficiency**

    The biggest benefit of our solution as we see it is to help older students be able to be more efficient with their time. By being able to use their voice to complete assignments, take notes, and being able to listen to readings, users can do school without having to literally be staring at a computer or phone the whole time. This will allow users to be able to school at any point - they could be on their commute, they could be doing yard work, or they could be working out while doing their classwork. Efficiency, then, is a core value of our product.

2. **Simplicity and User-friendliness**

    We wanted to make this solution as easy to use as we possibly could, with the goal that the app would be easy and intuitive for our main target audience of older students to use. With this in mind, our navigation options in the app are very straightforward, with simple icons and minimal clutter. In addition, we have placed the Help buttons and the corresponding FAQs section very prominently in the home page and throughout each page of the app.

3. **Community Engagement**

    We believe that an important part of class is being able to collaborate with classmates and fellow students, whether that is through working on projects, studying together, or generally discussing classes and topics. That's why one of our key tasks is being able to create and then share a note with a friend in the same class; by being able to share notes with each other, we believe students will be able to better work together and improve their own educational outcomes.

4. **Accessibility**

    In our app's focus on being able to help older students to do the functions of school through audio, we also see that this also can be of use for students who might have visual impairment issues. By being able to hear assignment questions and readings out loud and to be able to answer through their voice, no student needs to have perfect vision to be able to complete schoolwork.

Value Tensions

Workflow Efficiency vs. Simplicity and User-friendliness

The tension arises here when trying to streamline processes, because there is a risk that we could streamline too much so that features may not be intuitive to use. This could introduce complexity and reduce user-friendliness for older students, a domain that is not always tech-savvy. We really tried to address this by having other people testing our prototypes throughout the different stages even beyond our lo-fi prototype. By asking people and seeing where they had confusion, even if they were able to figure the app out quickly, we were able to adjust the app to make it as simple as possible without making it confusing and to add hints when necessary.

Simplicity and User-friendliness vs. Accessibility

The tension here comes when adding text-to-speech functionality may require additional elements in the interface, potentially complicating the design for older students who might not have interacted with any text-to-speech capabilities beforehand. In designing our product, we worked to make it as simple as possible in a couple of ways. First of all, we borrowed the typical recording layout and icons that most apps use in order to reduce the confusion for older adults during their first time using the app. Second, we wanted to make it as clear as possible what it looks like when one is recording, so we coded the button color to change from black to red when recording is happening, along with the user being able to see their words come up as text to represent that they are being heard.

Final Prototype Implementation

Tools Used and Their Pros and Cons

We used **Figma** for our medium-fidelity design. It was hard to test out audio given that the platform does not support audio which is a significant component of our app. However, we were able to test out the main screens and what information is needed per screen . For the hi-fi, we used **Expo framework, Visual Studio Code, and Github** to develop our app and collaborate on the app. Some limitations include not being able to code at the same time because Github can easily cause an overlap in code–leading to errors and crashing. Another limitation was that our app was unable to run with Expo Go due to using a react-native API. However, these tools allowed us to ramp up quickly and build the hi-fi completely from scratch and create a usable app in just a few weeks.

Wizard-of-Oz Techniques

1. **Connection Profiles**: Profiles will be suggested to the user based on preferences for proximity and if taking the same courses.
2. **Course Lis**t: Ideally, users will be able to add the courses they are enrolled in. Our app simulates the experience of being enrolled in courses.
3. **Assignments**: Generally, assignments will be provided to the user based on their course enrollment.

Hard-Coded Aspects

- Names of the courses
- Connection profiles photos
- User Profile
- Readings
- Assignments

Reflection and Next Steps

This quarter, we learned a great deal through the design thinking process. Three core things we learned this quarter throughout our project are:

1. Importance of Empathizing with Users
2. Intentional Iteration
3. Usability Testing and Evaluation Methods

Empathizing with Users - Initially, we discovered the essential importance of actively listening to and empathizing with genuine users throughout the entire design process, spanning from identifying needs to conducting usability tests and beyond. Engaging directly with individuals proved to be incredibly beneficial in comprehending their requirements and preferences, leading to the development and implementation of numerous vital features in our app based directly on users' articulated needs.

Intentional Iteration - We gained insights into the effectiveness of iterative design and ongoing testing throughout each phase of the design process. Reflecting on the initial sketches of our tasks and tracing our progress to the ultimate high-fidelity prototype, the correlation between our design decisions and the lessons derived from continuous user testing becomes evident.

Usability Testing and Evaluation Methods - Employing various forms of user testing and evaluation to obtain comprehensive and varied design feedback was essential to our final solution. For instance, user feedback obtained from the usability testing of our low-fidelity prototype provided distinct insights compared to the outcomes of heuristic evaluations performed on our medium-fidelity prototype. Through usability tests, we were able to refine the task flow, whereas heuristic evaluations facilitated the optimization of critical screen elements such as button alignment, app layout and colors, as well as error handling.

If we had more time, we would want to add more transcription languages to make our app accessible for students of all backgrounds and whose first language was not English. We would also want to focus on adding more of an aesthetic to our app by exploring color palettes that are not distracting to the user. Moreover, we want to connect our app to Canvas, so that students can automatically have their courses added to the app once they register.

Lastly, special thank you to our TA, Tiffany, for all the support provided to us along the way of this project. Your feedback was invaluable and allowed us to think creatively and outside of the box. Lastly, thank you to Prof. James Landay for this course, as we have learned so much!