

annotate

Final Project Report

INTRODUCTION

Meet the Team



Lindsey R.
Team Manager



Samuel H.
*Software Engineering
Manager*



Mark O.
*Usability Testing
Manager*



Nicole HH.
*Design
Manager*

We are the team behind Annote, an application dedicated to creating a comfortable and productive environment for sharing thoughts and ideas about class material. Annote targets students in university environments with backgrounds and personality types that inhibit them from contributing their ideas to the classroom, because every classroom is stronger with a diversity of opinions and ideas.

Problem Statement



Our mission

Students enter the college classroom with unique backgrounds and varying personality types. For students coming from under-represented backgrounds, the classroom environment can feel intimidating or even unwelcoming. This results in their voices going unheard in the classroom, leading to a less diverse classroom environment.

Solution Overview



Our solution

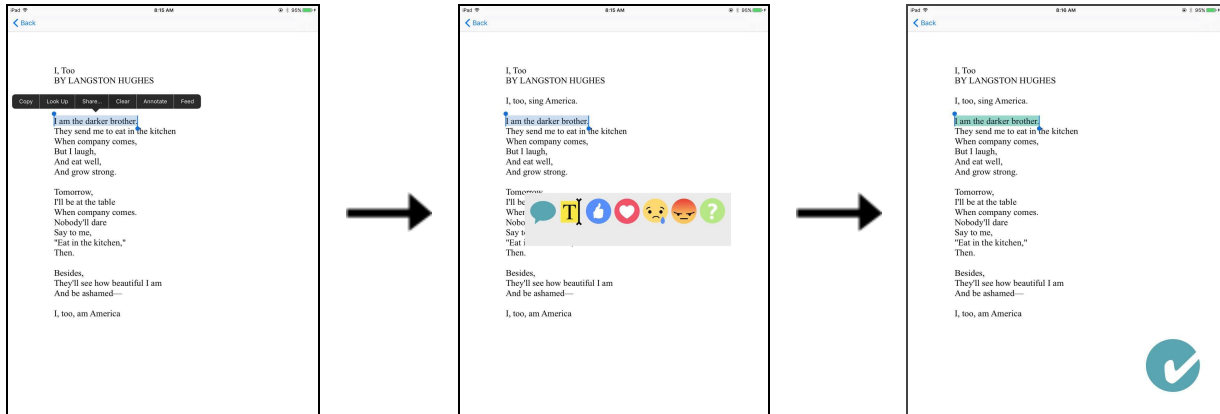
Annote aims to make all students into active, contributing members of the classroom community. We do this by turning every reading assignment into an online collaborative environment where these students can share and learn others' perspectives and insights in an intuitive and more comfortable way. With a number of annotation methods each with varying engagement levels, users will be able to annotate their readings exactly how they want to.

Tasks and Final Interface Scenarios



Simple Task: Annotate to share your perspective

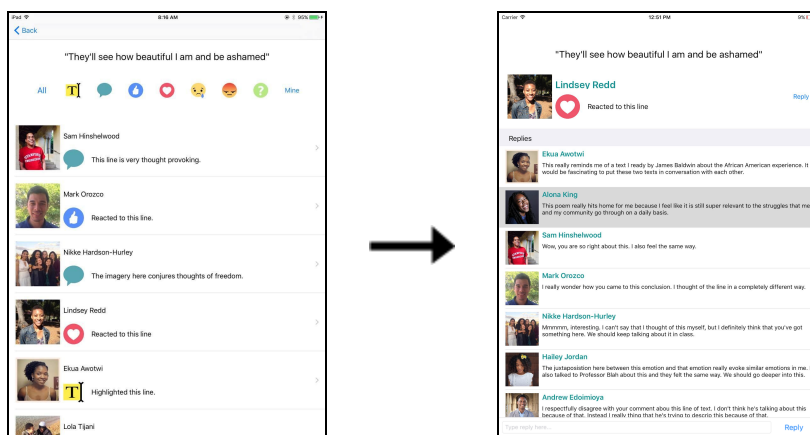
We chose this as our simple task because it is the fundamental interaction that we want users to do on our platform. As a collaborative annotation platform, we expect our users to primarily be students who already annotate their readings, but who want the extra features available through Annote.



Moderate Task: Learn from and discuss by reading and responding to their annotations.



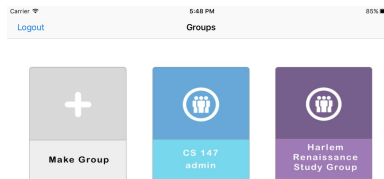
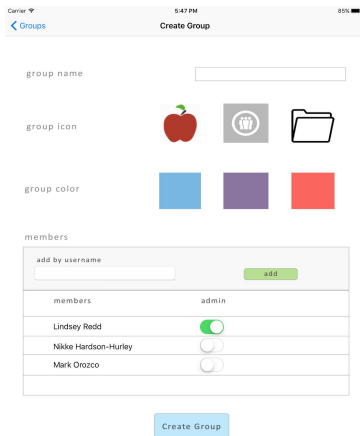
Beyond just annotating their readings, users can gain further insight by viewing the annotations of their classmates. Furthermore, they will be able to respond to certain annotations in order to start discussion similar to a simple online forum or message thread. All of these actions are not necessary to the use of this platform but are ways for readers to further contribute to the online micro-community.





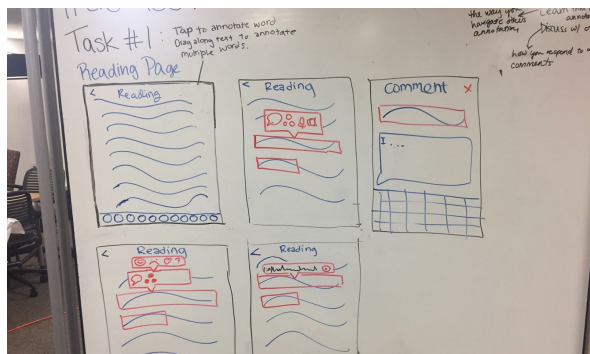
Complex Task: Manage a group of readers by uploading readings, adding members to the group, and viewing group statistics.

Relatively few users will have the need to create and manage groups, as that task will usually be reserved for teachers, TAs, or study group leaders. But for these users, we've built functionality that will allow them to easily manage groups and view certain logistical information about them. This task flow is mostly useless to your average user, but is essential for that specific pool of users.



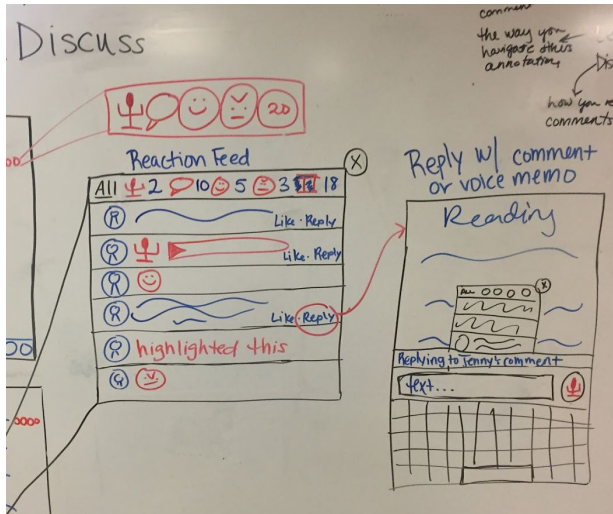
Design Evolution

Initial Sketch



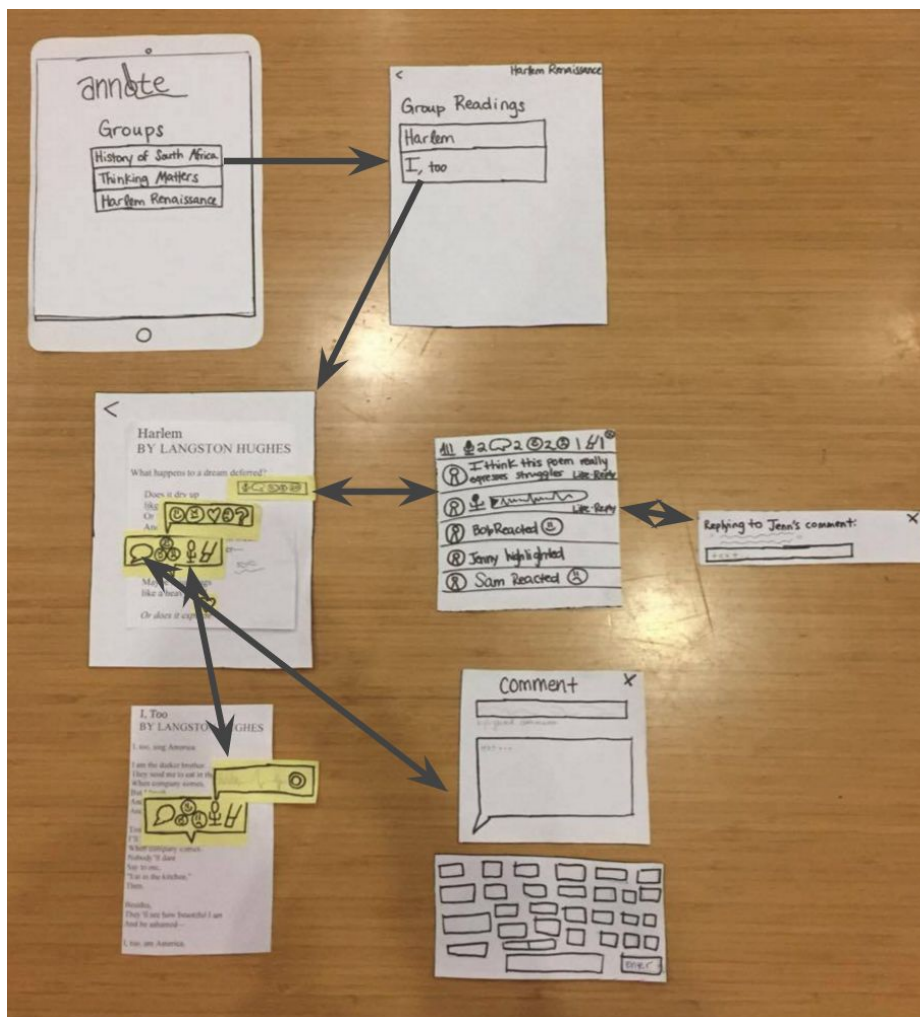
Annotate text

Explore others' annotations



Discuss with others

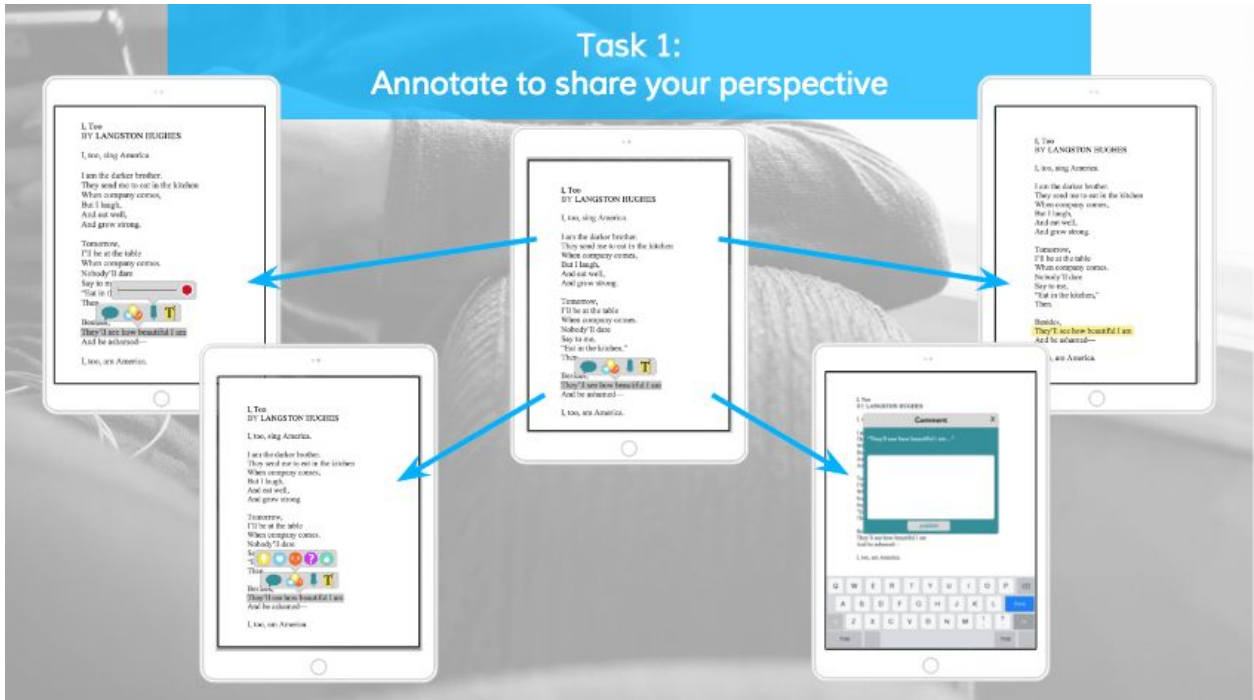
Lo-fi prototype



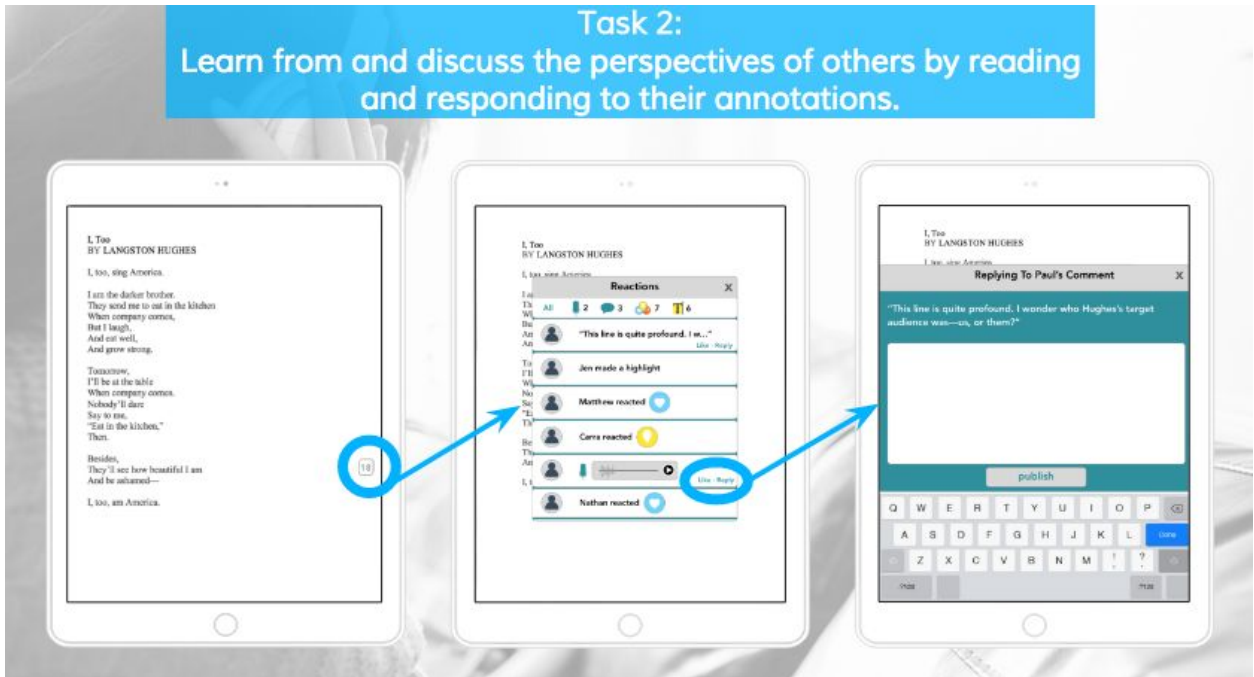
Entire system

Medium-fi prototype

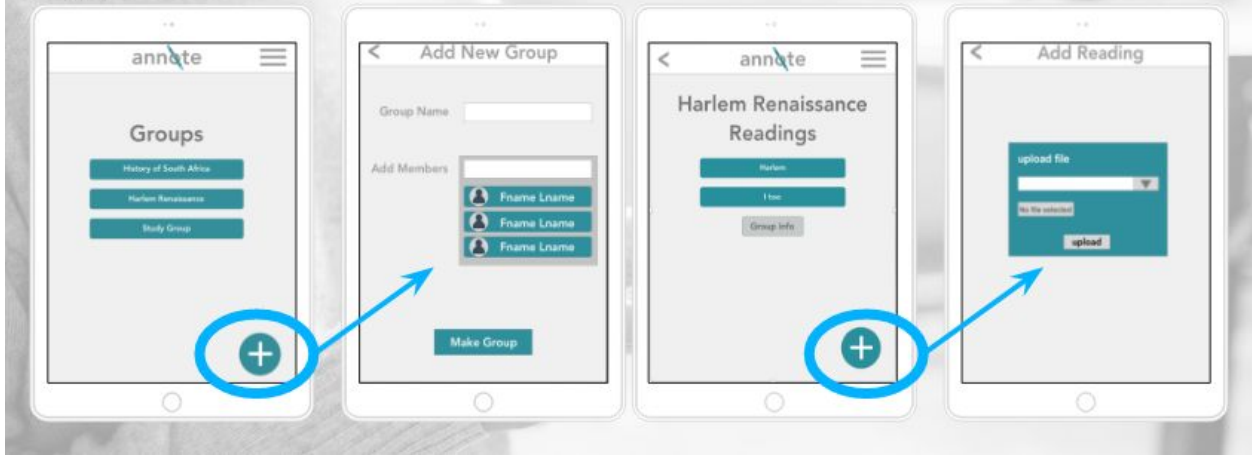
Task 1: Annotate to share your perspective



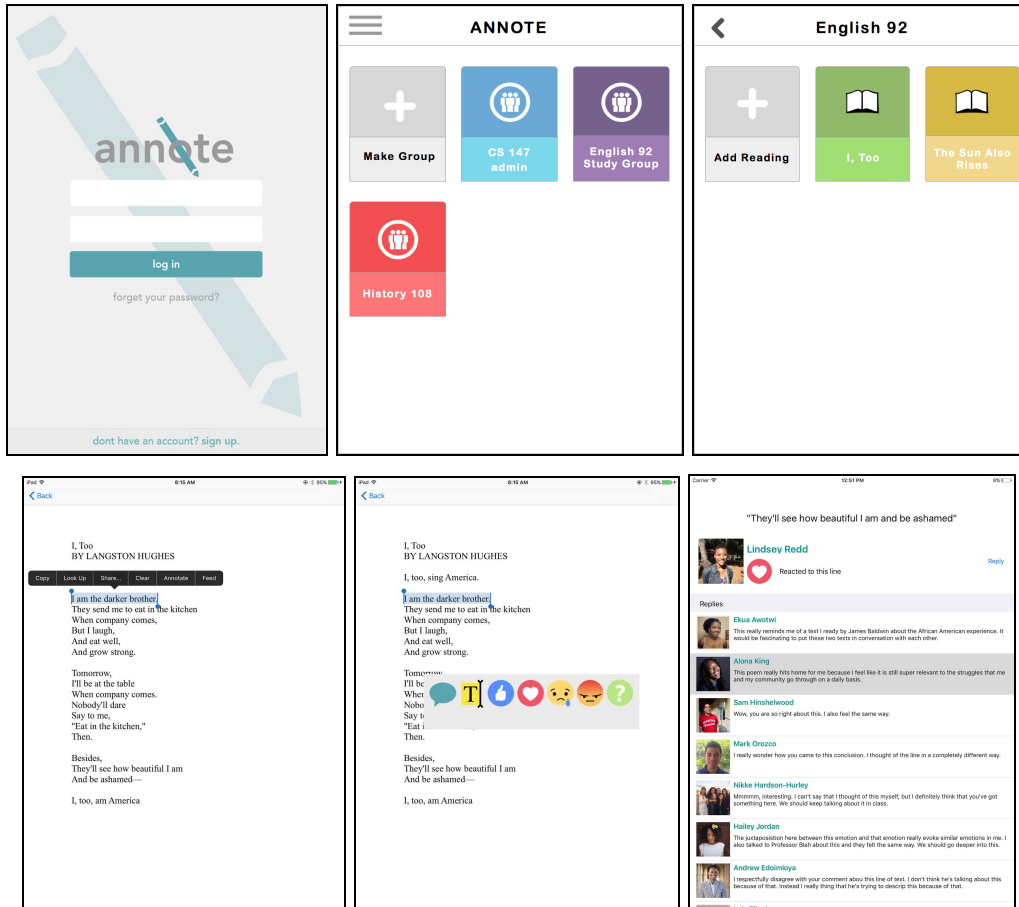
Task 2: Learn from and discuss the perspectives of others by reading and responding to their annotations.



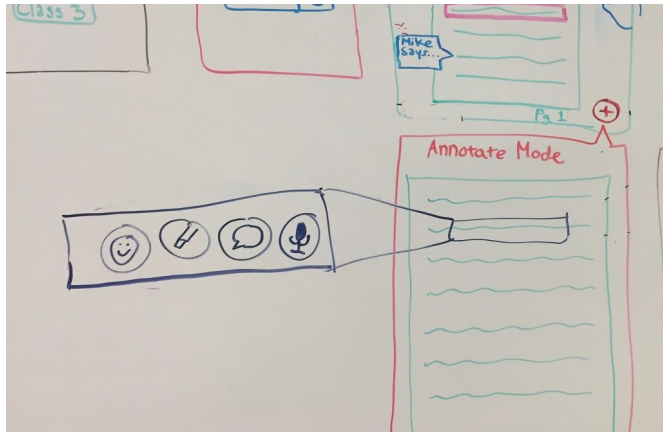
Task 3: Manage a group of readers by uploading readings, adding members to the group, and viewing group statistics.



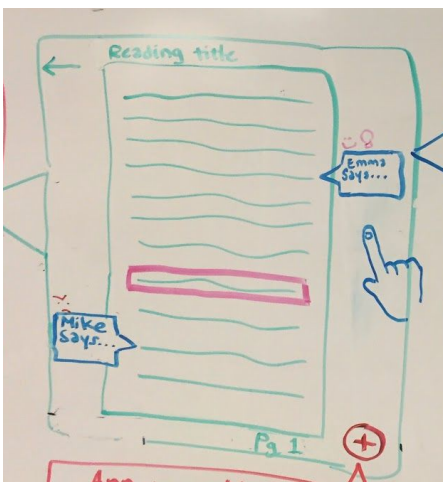
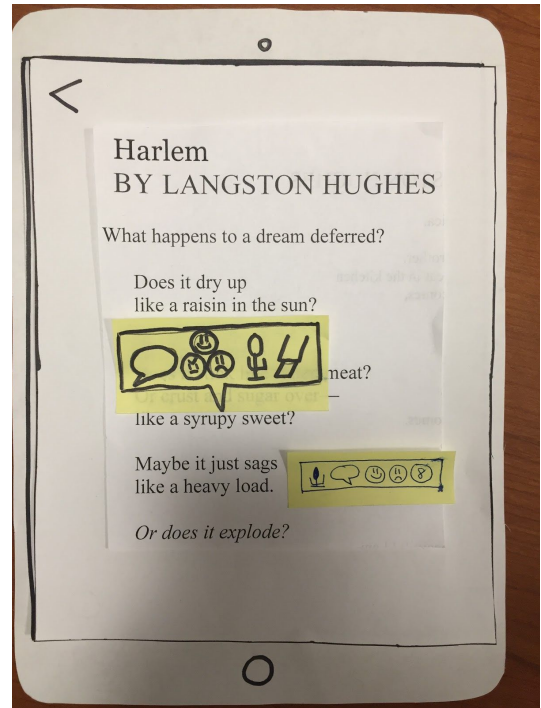
Final design



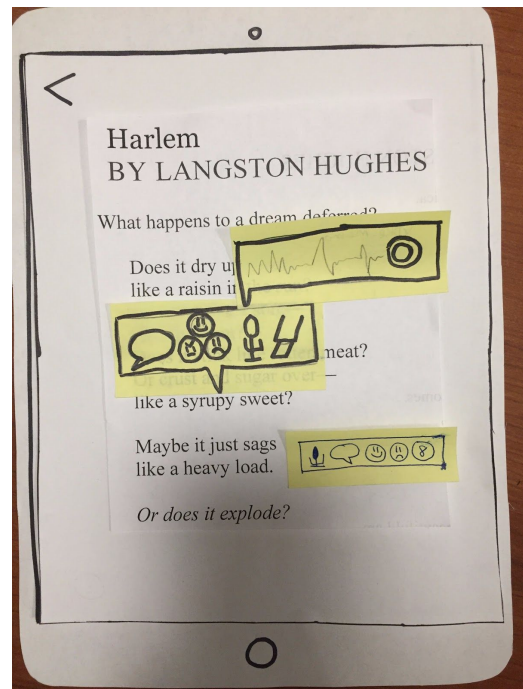
Design evolution: initial sketch -> lo-fi prototype



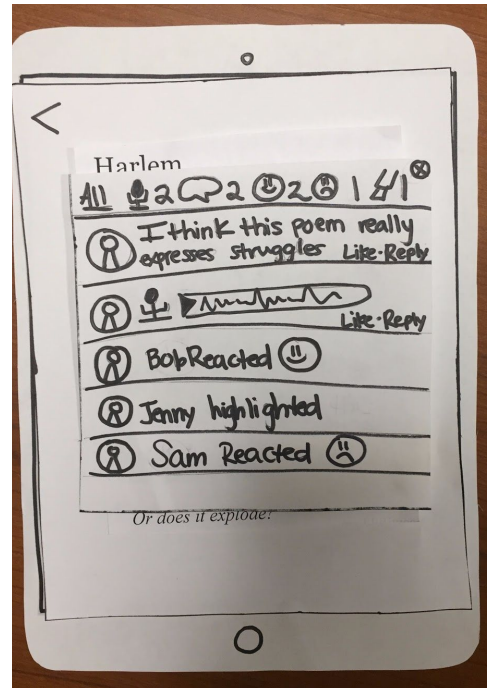
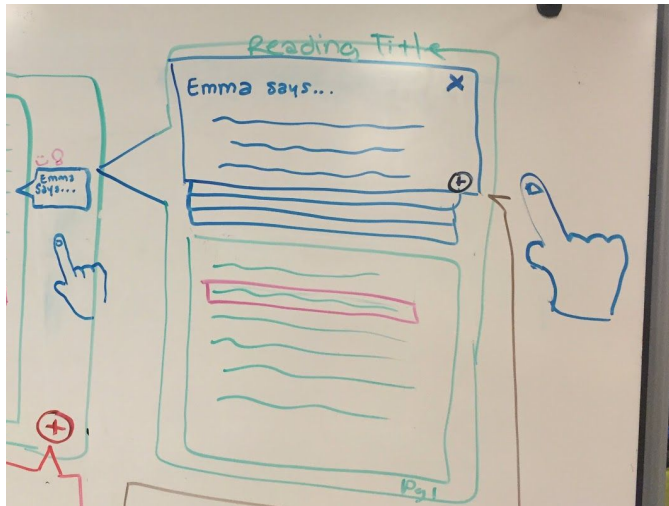
Change 1: In the initial sketch, we were unsure of how to display the annotation type selector bar on the page. Also, we required users to press a red + button on the bottom right of the screen before selecting the text to annotate. In the lo-fi prototype, we decided to overlay the annotation selector bar over the text, and we removed the + button in favor of simply allowing users to slide their finger across text to annotate it.



Change 2: In the initial sketch, we recognized that we needed icons to represent text that has been annotated by fellow classmates, but after doing further in-team analysis on the strengths and weaknesses of our sketch, we realized that the icons were rather large, clunky, and not organized very well. We changed this design in the lo-fi by making the annotation indicator a

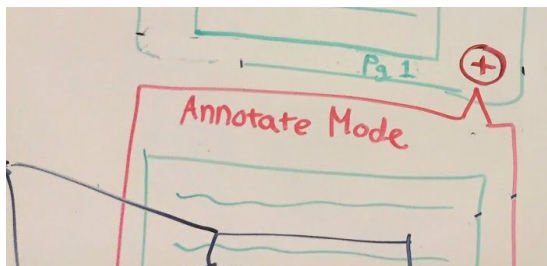


straight, organized bar that displays the types of number of annotations associated with that line.



Change 3:

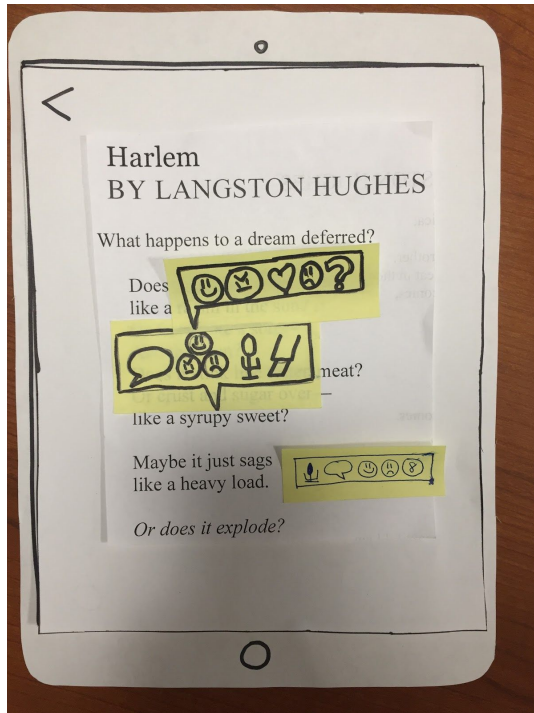
In the original sketch, pressing another users' annotation indicator icon will bring up information related to that specific annotation. For example, pressing the comment bubble would bring up Emma's comment. However, we realized that this limited us in how many comments we can represent in the reading and that users may have difficulty reading the small text in the comment box icon. We changed the design to an annotation activity feed that will pop up when you click the annotation indicator bar. This feed displays all annotations associated with the line, and the number of a specific type of annotation.



Change 4:

We got rid of the concept of an annotation mode entirely. In our in-group analysis, we decided that a button that separates a user from reading and annotating is superfluous, and that it would be easier for a user to annotate directly from the reading page.

Design evolution: lo-fi -> medium-fi prototype



I, Too
BY LANGSTON HUGHES

I, too, sing America.

I am the darker brother.
They send me to eat in the kitchen
When company comes,
But I laugh,
And eat well,
And grow strong.

Tomorrow,
I'll be at the table
When company comes.
Nobody'll dare

Se
"E
Then

Besides,
They'll see how beautiful I am
And be ashamed—

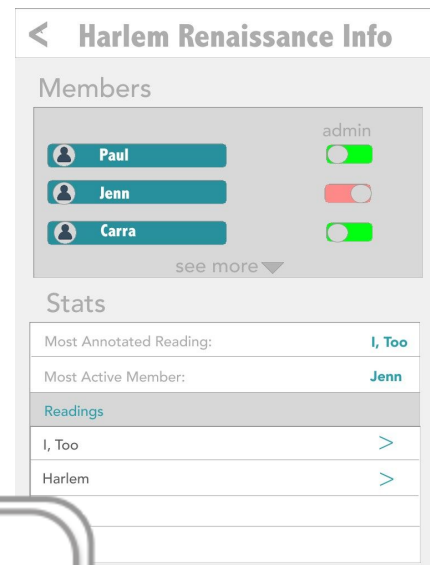
I, too, am America.

Change 1:

In the lo-fi prototype testing, we received some feedback that the icons weren't always clear in regards to what they allowed the user to do and that the popup took a lot of space. We made a more aesthetically pleasing design for the annotation popup in our medium-fi testing that took less space, and more clearly indicated what each button was for.

Change 2:

Some feedback that our team received when presenting the lo-fi prototype results to the class was that it was unclear how users would be able to initialize and manage groups. Our TA suggested that we make the management of groups an entirely separate task. Therefore, we designed group and reading management pages for group owners to view. These pages include stats to help the group owner understand group dynamic.



Change

18

3:

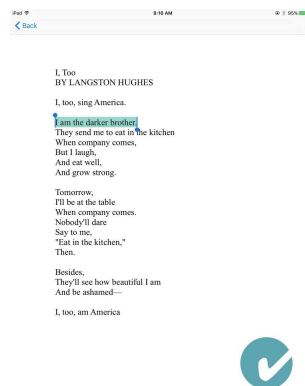
In our lo-fi prototype testing, almost every user had difficulty telling the difference between an annotation indicator bar and the annotation selector. We decided that the best way to remove this ambiguity and to reduce the amount of space that the annotation indicator occupies was to switch to a very simplistic design that only displays the number of annotations associated with that line.

Major Usability Problems Addressed

2. H2-1: Visibility and Status / Severity 3

There is no indication of whether a comment or a reaction was successfully published. Without instant feedback, users may not realize if there was an error posting a reaction/comment (i.e. due to poor network connections/other system failure). Should find a way to focus user's attention to the increased number of comments to the right of the text.

Now when someone annotates a line a small check appears on the screen for a couple of seconds. Additionally, the line will stay annotated. By going to the feed the user can see their annotation.



3. H2-1: Visibility and Status - Severity 4

There are five different tab controls (All, Voice Memos, Comments, Reactions, and Highlighted Text) at the top of the Reactions list, but it is unclear which tab is currently selected. Selected tab controls should be highlighted, bolded, or be in a different color to easily indicate that users are currently on that specific tab.

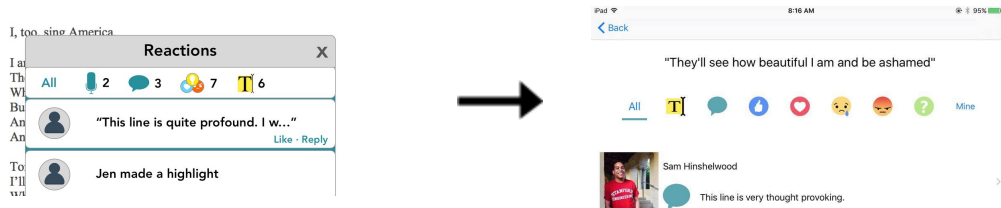
We added an underline that would serve to indicate what icon is selected. We felt this would serve as a clear indication to the user. The design unfortunately was difficult to add to the actual implementation but it will be included if we continue the project.



4. H2-1: Visibility of System Status / Severity 3

There is no specificity what part of a line other users have reacted to in the action flow (i.e.: Jen made a highlight: was it because of a specific word or phrase?) This violates the heuristic because the user may be confused without specific information on what part of the text is getting which reactions. I would suggest adding the option of an explanation for icon or highlight reactions

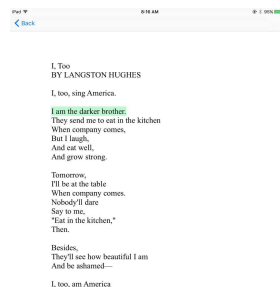
We added the line being responded to to the top of the feed. It is not clear to the user what line the comments and reactions are referring to.



5. H2-1: Visibility of System Status

There is no indication as to whether a line has been commented on already. For example, when I published a comment, nothing signaled to me that that line had been tackled already. This violates the heuristic because the user may lose track of whether they have already addressed and annotated a part of the literature. I would suggest that the line should be highlighted or underlined as indication that it has already been interacted with.

User annotations now stay highlighted to indicate that they have interacted with a piece of text. Now users can read aware that all highlights are their annotations.

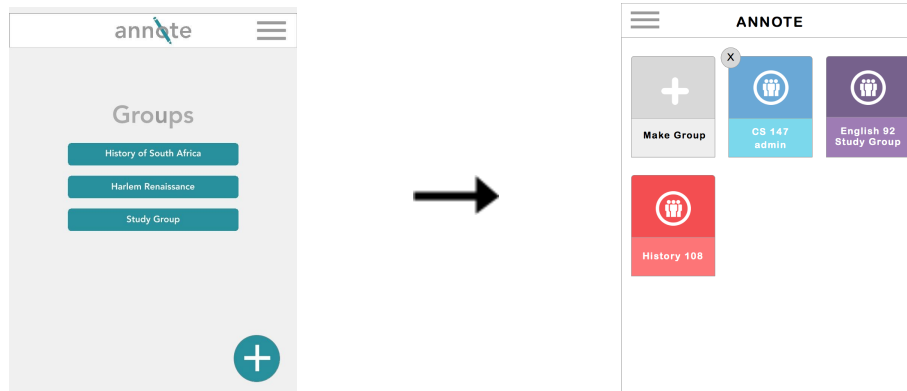


****The highlight is the user's annotation which can be viewed in the feed.****

6. H2-1: Visibility and Status / Severity 3

The group info screen should have higher color contrast text for users with low vision. The light grey text on white or grey background is very difficult to read. Should use darker text color for better contrast.

We moved from the grey on grey text to the black on grey or white on color text. We hope that the contrast between these colors will be more visible.



8. H2-1: Visibility and Status / Severity 4

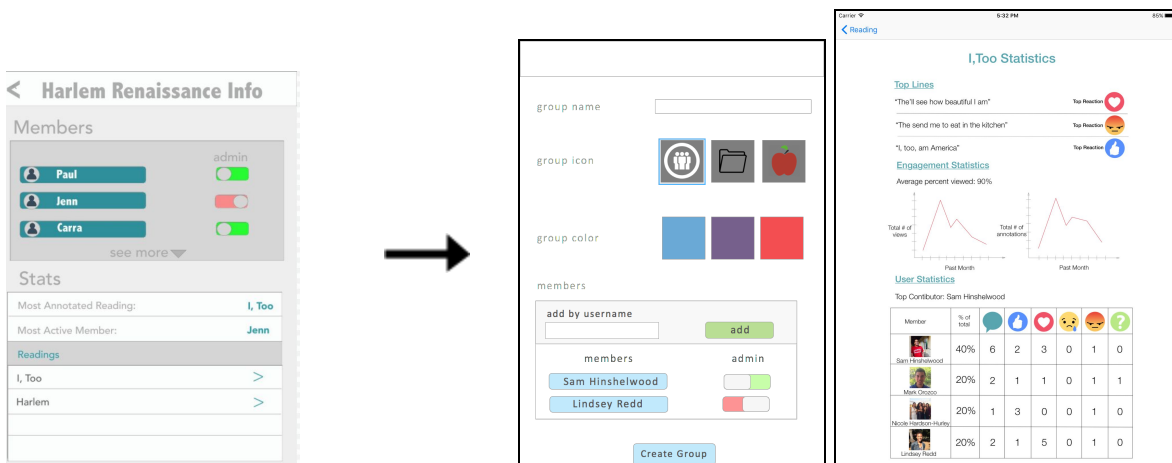
Inside a group (in the reading list screen) there is no indication whether the user is an admin or not. This status will probably affect a user's ability to add files into the group. Should have a section to indicate the user's status in the group.

This violation was a small confusion on the part of our evaluators. The ability to add a reading will only be available if you are an admin. So the + button and group settings pages on the readings pages will simply disappear if you are not a group admin.

11. H2-2: Match Sys & World / Severity 3

On the Group Info screen, readings or stats come after members. Since I assume classes are relatively static but the readings or stats are not, the latter should take a priority and first read of the screen since those would be things most checked on.

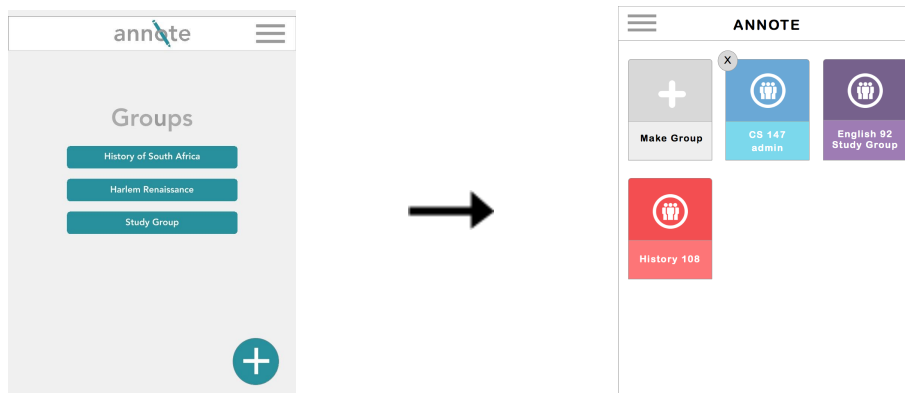
We decided to switch the Group info screen into two separate screens. There is now a group settings screen and a reading stats screen. This will allow admins of groups to separate the two sub-tasks of changing the members of the groups and exploring the group statistics. We hope that this conceptual split will be clearer and more seamless.



14. H2-3: User Control & Freedom Severity 4

There is no way for users to search a group or leave a group there are already in. Users need control of their group activity within the app. Should include an option in the group info screen to leave that group if they wish to.

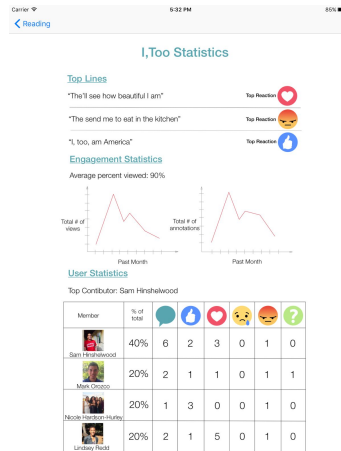
Our design has shifted from a list of groups to something more similar to the Apple app page design on the iPhone/iPad. We were hoping that this design would lead users to attempt deletion of groups and readings via a very similar method. They can hold a group and a deletion 'x' will show up on the top left corner. This is preferable to the missing functionality that was in our original design. Feature currently not implemented.



17. H2-4: Consistency and standards / Severity 3

For the Group Info screen, the Stats screen shows how the most read is "I, too" and the most active member is Jenn, leading me to believe Jenn was the active member on that reading. However it is actually Paul is the largest contributor to that reading. Stats should be grouped in which related records are put physically together on the screen.

We edited the stats screen so that now, there is a table filled with all of the stats of each user. This reduces the ambiguity stated in this violation, while also making the reading stats page more comprehensive in general.



22. H2-4: Consistency and Standards / Severity 3

There is ambiguity between highlight and comment icons. The “T” for highlighting can easily be mistaken for typing a comment. This violates the heuristic because it may confuse the user as to the difference in functionality between the two icons. I would suggest using an image of a highlighter instead of the “T” for the highlight option.

We decided to keep the current highlight icon style (although we revamped the design a bit) because it is the style that certain other platforms use (Adobe Acrobat Reader), however, after some feedback from the showcase, we may actually change this with future development.

23. H2-4: Consistency and standards / Severity 3

There’s no button to add new members into a group on the group info page. It’d be maybe more intuitive to have ways to delete

We added the ability to add members from the create group and the group info pages. This is essential feature for admin to modify the group members.

Group settings page

The screenshot shows a 'Group settings' page. It includes a 'group name' text input, a 'group icon' selection with three icons (a group of people, a folder, and an apple), and a 'group color' selection with three color swatches (blue, purple, red). Below these is a 'members' section with an 'add by username' input and an 'add' button, followed by a table with one member listed as 'admin' and an 'update group' button at the bottom.

25. H2-5: Error Prevention / Severity 3

The administrator toggle switch in the group info page is solely indicated by green and red. This is bad for color deficient users. Should have alternate symbols like a checkbox to indicate administrators.

We did not address this issue within this prototype, although it is definitely one that we would like to address with future development. Hopefully, some users will be attuned to ios's switch standards (left is on, right is off), but I understand the limits of this.

26. H2-5: Error Prevention / Severity 4

There is no way to delete/undo an annotation. Should have a separate tab under the Reactions list called "My Reactions" where users can manage their comments and reactions.

We have not yet implemented the ability to delete or undo your annotations. We fully support the ability to do this, as it is a basic ability of standard paper and pen annotations, but we were unable to do so within this prototype due to time restraints.

28. H2-5: Error Prevention / Severity 4

Users seem to be able to access administrator assignment privileges without necessarily being administrators themselves through the "Group Info" button. This violates the heuristic because arbitrary assignment makes the whole principle of administrators redundant and can also lead to user errors since people will be able to edit files without owning the group. I would suggest restricting access (both editing and viewing) to these options if the user is not an administrator himself.

This is a definite problem that we would need to address with further implementation. Currently, the sample "user" only has groups in which they are the admin, so we circumvented this issue, but it will need to be addressed in further development.

29. H2-6: Recognition, not Recall / Severity 3

In the reading screen, not clear on how to actually make an annotation. Should have explicit instructions on how to use the annotation interface.

We have included a help section within the reading, accessible through a right-side slide out nav bar, that outlines how to interact with the reading. We figured that this was very important to onboard users during their first few interactions with the app. Also, we are using IOS's default text highlighting feature to make annotations which is, we think, rather intuitive for new users to use.

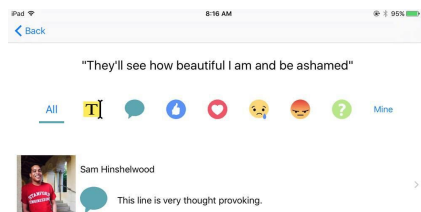
**This is the help screen,
easily accesible from**

the readings page

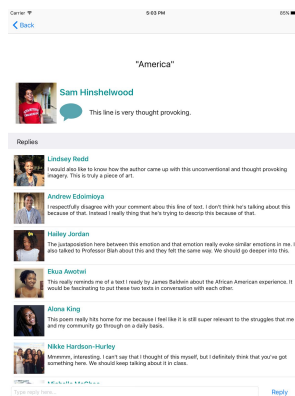
31. H2-7: Flexibility & Efficiency of Use / Severity 4

In the Reactions screen, there is no way to read a full comment without clicking the reply button. Users should be able to read full comments before choosing to like or reply to them. Should either make the reaction tables larger to fit an entire comment, or have users be able to tap on a comment to expand the table cell to view the entire comment.

Users can now tap on a comment to view the entire comment as well as all responses associated with it. This allows users to be able to read longer comments before choosing to reply to them.



If this comment was too long to fit on the screen, you can simply tap it...

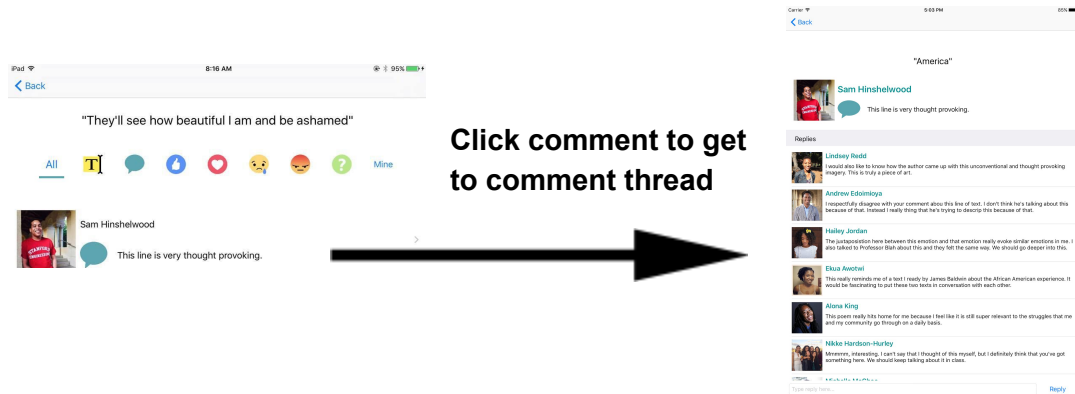


And see a more detailed comment thread.

32. H2-7: Flexibility & Efficiency of Use / Severity 4

There is no way to view the replies to comments in the Reactions screen. Each comment should indicate how many replies it has received and there should be a way to show all the replies to a specific comment. Similar to Violation #3, users should be able to click on a comment to “expand” the table cell where they can have access to the entire comment as well as the ability to scroll through all the replies.

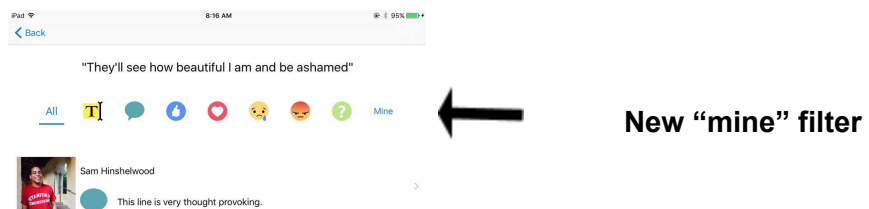
We included comment threads in our final prototype. This allows you to see all of the responses that yourself and other users have added to particular comments. You reach this by clicking on the comment within the reaction feed.



33. H2-7: Flexibility and Efficiency of Use / Severity 4

There is no way to filter reactions to a single user's (i.e.: or even the current user.) This violates the heuristic because it impairs the ease of usage since if a user wants to see his or her own reactions for example, he or she would have to scroll through the entire reaction action flow. I would suggest adding a user search function for reactions, or a "my reactions" tab.

We addressed this violation by adding a filter within the reaction feed to show only the user's annotations. However, we did not include filtering reactions based off of single users. That may be a feature we implement with future development, but our MVP does not yet have much attention on filtering by individual profiles.

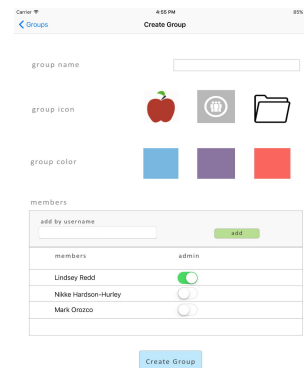


35. H2-7: Flexibility and Efficiency of Use / Severity 3

When adding group members, there's no way to change their admin permissions (or set them in the first place). Include an option to be able to have their admin permissions be set.

This was already an available option in the medium-fi prototype. The only thing we added was a way to add admin permissions from the create group screen, supplementing the already implemented feature in the groups setting screen.

We added an admin toggle



36. H2-7: Flexibility and Efficiency of Use / Severity 3

There is currently no way for users to automatically join groups or classes without brute-force writing down the name word for word. It would be ideal to provide a way for users to find class names more efficiently.

We did not include a feature for users to join groups of their own accord. For an MVP and based on our three tasks, this simply isn't essential, as administrators can easily add users to a group (which is what will usually happen, anyway)

38. H2-7: Flexibility and Efficiency of Use / Severity 3

The stats of each reading can only be accessed through a different flow than that of viewing the actual reading. I want to be able to check the stats freely while I'm reading the text without having to backtrack through several screens. The reading screen should be able to directly access the stats screen.

We included a menu in the reading page that, when opened, allows you to travel to the reading statistics page. This is a much quicker path than we had before.

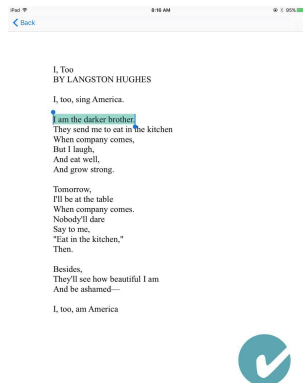
Click menu to
get nav bar



42. H2-9: Help Users Recognize, Diagnose, and Recover from Errors / Severity 3

Highlight disappears after looking at reactions screen (not sure if actual bug or just forgot to not link reaction screen if text is highlighted.) This violates the heuristic because it seems like an error that his or her highlight disappeared, but there is no indication or fix supplied. I would suggest an alert telling the user if their action is invalid or failed to register.

Our highlights are now pervasive and a brief popup appears on the reading indicating that an annotation has been added.



Prototype Implementation

To build our high-fi prototype we coded in Swift 3 utilizing Xcode. We also built several screen layouts in Sketch. Xcode was an excellent tool for building out our views and creating the storyboard for the overall tasks. Annotate was optimally formatted for a 9.7" iPad Pro. We used an outside library called SideMenu (<https://github.com/jonkykong/SideMenu>) installed using Cocoa Pods. Each tool was necessary for bringing our high-fi prototype to completeness, allowing for all three tasks to be executable. No tool proved unresourceful.

Data persistence was a Wizard of Oz technique that involved storing all user data in the overarching app navigation controller, then accessing it whenever needed, the app is not connected to an actual database. All of the current members, their photos, their comments, and their reactions are hardcoded to give the look and feel of a production app. Things to be further implemented: the "Add Reading" page is static, meaning you there are no implemented text

fields or buttons, as is the “Reading Statistics” page--both are action items for the future. Currently there is no database backing this application as well (any data persistence experienced--adding a group, text highlighting, your annotations and replies to annotations appearing in the annotation feed and the replies page respectively--is temporary and will be lost upon closing the app. This is also an action item for the future.

Summary

Designing Annote was a challenging, educational, and empowering project for all of us to work on. Although we came together with varying exposure to the design process, we all engaged in it seriously and reaped many benefits from that. We believe that our platform is a serious attempt at designing for an underserved population. The final prototype of Annote involved enhancing many aspects of the medium fi prototype that were half-baked and simply not implemented. We think that basing our improvements to the platform on this heuristic feedback was a useful way to determine where our development time was best placed. Developing Annote was a lofty goal for the amount of time we had. It aims to do a lot on a platform that most of us were not familiar in. In the last few weeks, we gained many interesting insights into the area where design meets implementation. We all have built a serious connection to Annote, and our next step is determining whether we want to continue development on it either in CS 194H, or through another outlet.