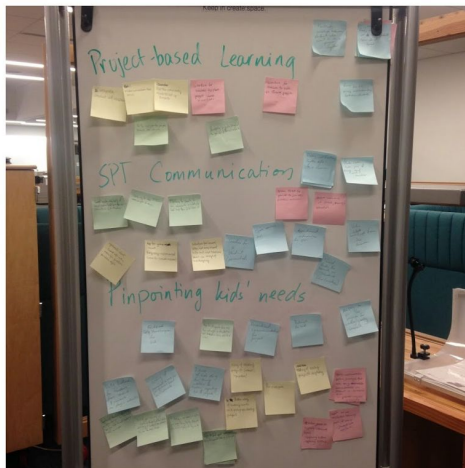
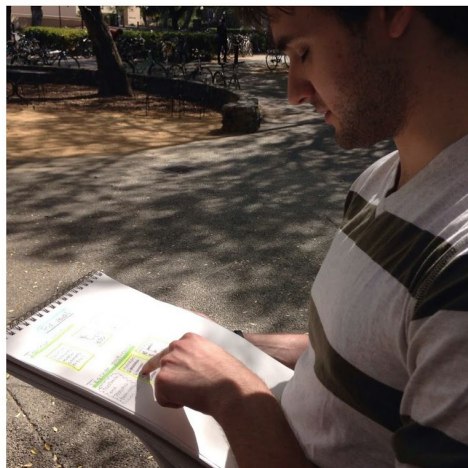


Team EduConnect: Ikechi A., Gerardo S., Filippa K., Priyanka R.

Project Perfect

Painless class projects



Problem and Solution Overview

Take-home projects provide excellent opportunities for students to internalize knowledge through hands-on activities. However, in their current state, these projects come with a unique set of challenges: teachers may struggle designing clear and thorough specifications, they may distribute paper handouts that never make it home, parents and students may have questions that never get answered, and submitting

deliverables can be a nightmare of its own. At EduConnect, we believe that all of this friction can be eliminated. Our mission is to bring painless class projects to classrooms everywhere by creating a virtual platform where teachers can easily create and assign projects, and students can easily complete and submit them. In this report, we discuss the design evolution, heuristic evaluation, usability problems, and prototype implementation of our product, **Project Perfect**.

Tasks & Final Interface Scenarios

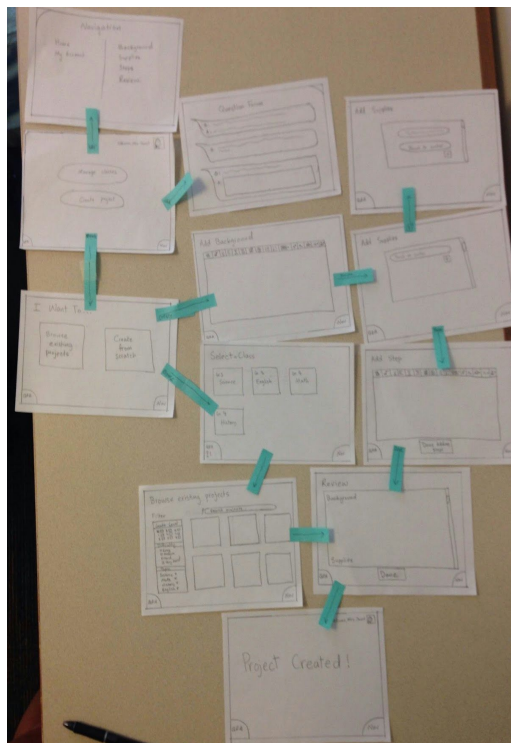
Task No.	Task	Complexity	Interface Scenario
1	Teacher assigns a class project with background info, a list of supplies, and steps for students to follow.	Complex	Ms. Karrfelt, a 5th grade teacher, needs to reinforce students' understanding of class material and decides to do so through a class project. Now, Ms. Karrfelt needs to create and assign the project to her students.
2	Student works through project step-by-step.	Medium	Shalini, a student in Ms. Karrfelt's class, goes through the project guidelines and starts following the directions at home.
3	Student submits completed class project to teacher for review.	Simple	Shalini has finished the project. Now, she needs to submit it to Ms. Karrfelt.

Design Evolution

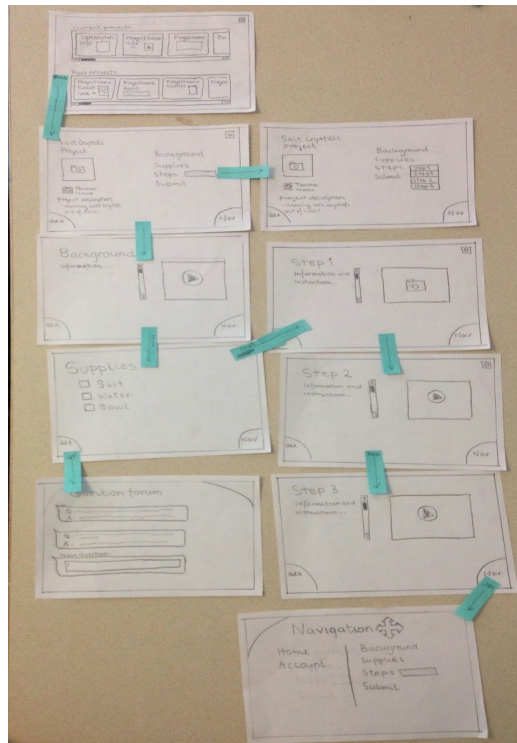
We began our design process by brainstorming rough realizations on different kinds of devices (iPad, desktop, mobile). We eventually selected the iPad as our target device because of the mobility and touch based interaction it provides to our target audience while they are doing projects, which often get messy.

For our low-fi prototype sketches, we focused on creating a modern, functional, and minimalistic design. For the teacher's interaction with the app, we thought that something in the style of Microsoft Word would be intuitive and easy to understand, though possibly cumbersome for extensive text entry. For the student tasks, we designed our app so that a left/right swipe moves you backward/forward through the project. We made this design choice because we thought it was in line with the kind of interaction currently prevalent in books/reading apps. We also made the navigation and Q/A features of the app accessible on every screen of the app. We designed them so that a diagonal swipe could pull out the screen and a reverse diagonal swipe could push back the screen. Since we were targeting the iPad, we further decided to leverage the photo taking capability of the iPad in our submission page for the student.

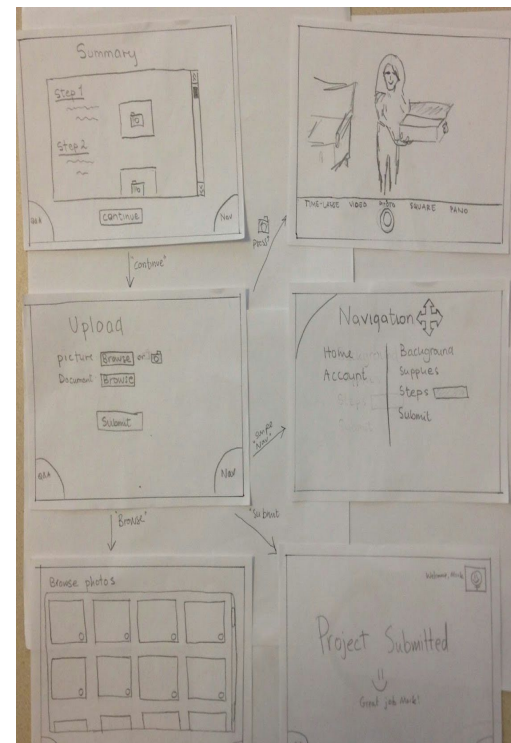
Task 1



Task 2

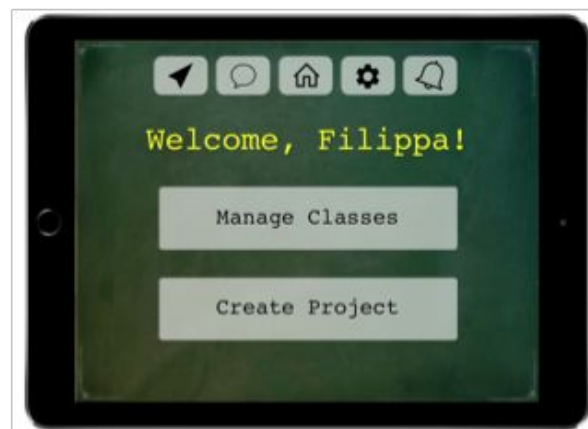
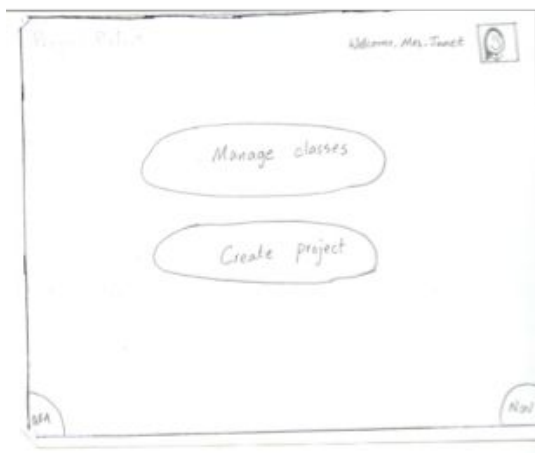


Task 3



Our usability testing feedback for the low-fi prototype strongly resonated around the trade-off between intuitiveness and ease of use. For example, the teacher we conducted a usability test on found the text entry to be off-putting but also liked the ease by which she could format the text and customize text to her unique teaching style. The students found the swiping between project pages useful and even enjoyable once they discovered the feature, but not intuitive at first sight. We factored this feedback into our medium-fi prototype design iteration.

For our medium-fi prototype, we mainly changed the navigation bar, how students move along pages in the project, and how the teacher creates the project. For example, in the low-fi prototype below, the navigation option was in the form of a quarter-circle that would have to be diagonally swiped. To fix the problem of this not being intuitive (though useful), we replaced it with a familiar navigation bar that still appears on every page (see



below):

Fig. Low-fi prototype navigation was a quarter-circle, whereas medium-fi prototype navigation was a more familiar bar.

We also changed the medium-fi prototype so that students move along pages in the project by clicking on arrows that better indicate what they do. Previously, our design had students swipe to move along in the project.



One other major change we made was in how the teacher creates a project. We changed this creation process from a customizable text-editing design to a design where unlimited “pages” could be added and information could be parsed pulled from google docs. We thought this would be easier to use on a device such as the iPad and still customizable since multiple unique pages (one with pictures, one with text) could be added to the project.

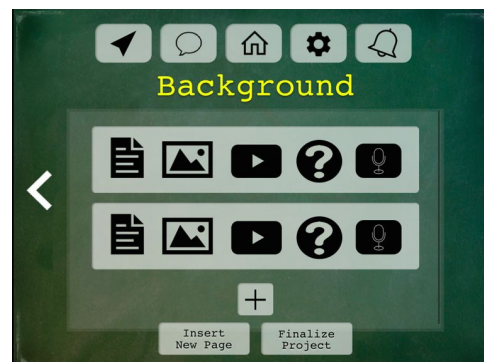
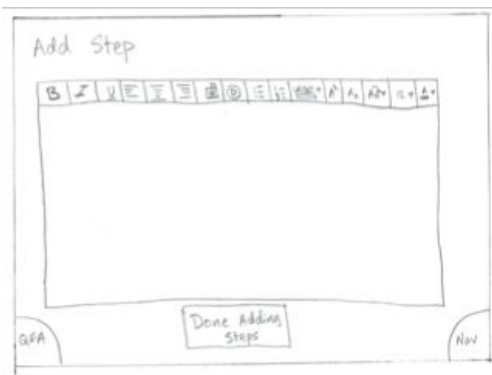


Fig. In the low-fi prototype, text is entered as in a text-editor. In the medium-fi prototype, data can be pre populated from google docs or urls.

Major Usability Problems Addressed

Once we finished the medium-fi prototype, we received heuristic evaluation feedback from other students in the class.

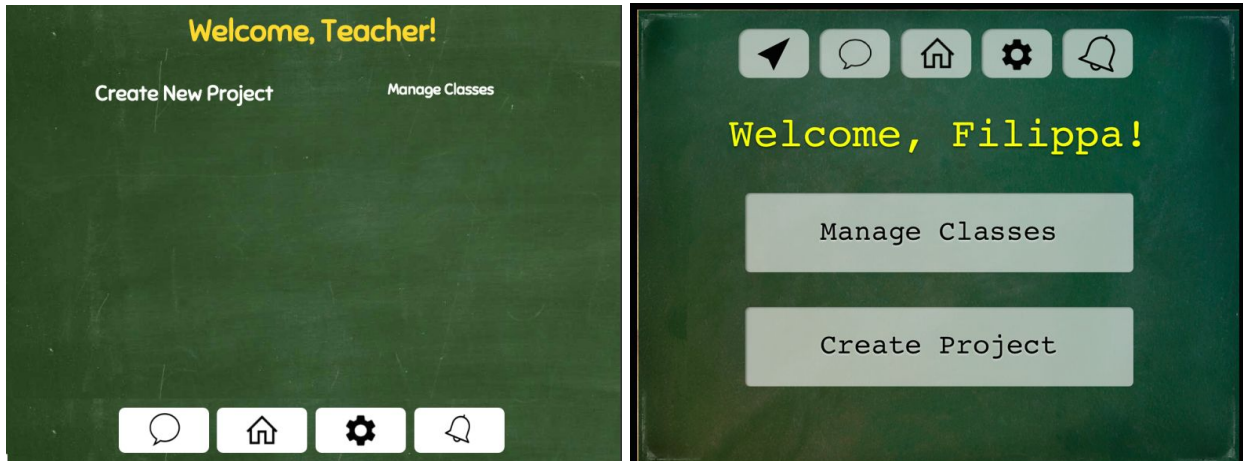
Heuristic Evaluation Feedback And Changes

Navigation and consistency

- Heuristic Evaluation Feedback:

- Where does 'home' 'nav' 'notifications' take you when in the app?

- What does the home button mean?
- Changes:
 - Make sure the navigation button links to the same place
 - Clarify the use of it



We decided to take out the navigation button in the teacher interface, since it was more confusing than it was necessary. If we would develop the app more, we would implement a tutorial to show what it does when in use.

Logging in and out

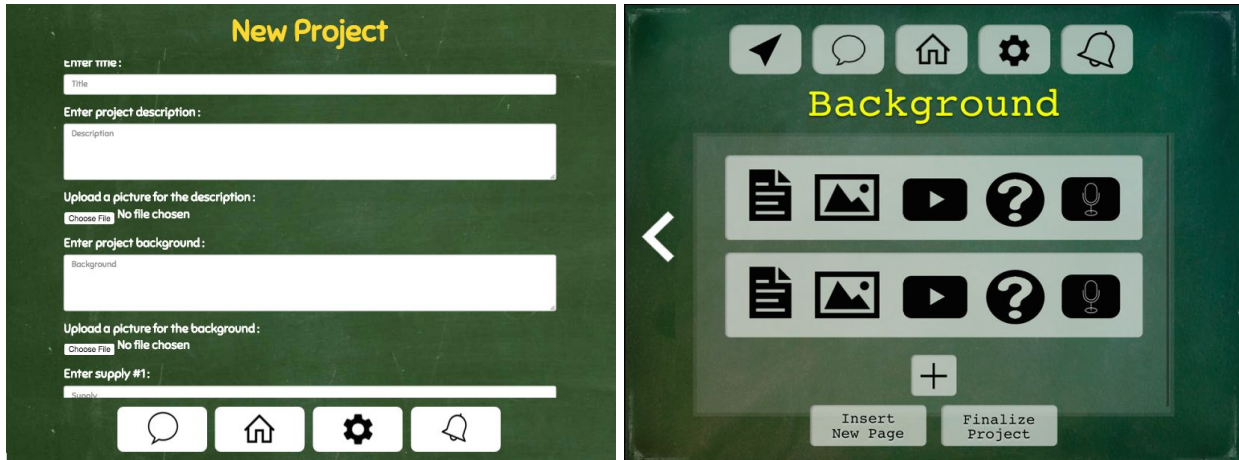
- Heuristic Evaluation Feedback:
 - Logging out and changing project -- or for teacher to go from creating to managing.
 - There was no log out, or changing from student to teacher.
- Changes:
 - Making transitions easier within the app and being consistent about where the 'home' button will lead.
 - Creating a log out option.



In the medium-fi prototype we did not have an option to log off. In the hi-fi prototype we added in a settings page where you have the option to log off.

Teacher creating a project

- Heuristic Evaluation Feedback:
 - How the teacher finalizes the project -- taking away unnecessary clicks and recall
 - Consistency in system status messages
 - Error prevention in the teacher creating project part (correcting mistakes in previous steps)
- Changes:
 - Making the creation project build more on affordances of as regular text editor.



where we in the medium-fi prototype had a separate page for each part of the project creation, we for the hi-fi prototype combined it all into one form. Instead of having the option of inserting different kind of media it would handle all of that through the upload file button (right now we can only hold text in the database - being able to handle different types of media is for the future).

Other Changes

We decided to move the navigation bar to the bottom of the screen instead of the top. This since it gave us better use of space on the screen and a better visual hierarchy overall.

Prototype Implementation

Tools

Coming into the project, none of us had any web or iOS development experience. Since Ikechi and Priyanka had at least some exposure to HTML/CSS and Rails, we decided to build a responsive web app that could be run on the iPad (our target device). To accomplish this, we taught ourselves how to use the Ruby on Rails framework, how to host our web app on heroku, and how to use HTML/CSS, Javascript, Bootstrap, and sqlite3/postgresql to implement core functionality.

Rails helped because it automatically generated the structure of our website, unified the interaction between the front-end and back-end, and made testing easy on our local

servers before we pushed to Heroku. It didn't help in the sense that it was hard to debug (we used "puts" to print information to the terminal instead of stepping through code). The other technical tools we used were mostly straightforward. Bootstrap in particular was very helpful to us in achieving a polished look for our product.

Wizard of Oz Techniques & Hard-Coded Data

In terms of Wizard of Oz techniques, we made the project creation for the teacher limited to three steps and three supplies. This helped make our generation of steps and supplies for task 2 much easier. However, if more than three steps/supplies are seeded into the database, we are able to display as many of them as are created. We just weren't able to extend this feature with the HTML form in our teacher page. Also, we hard coded some seed data into our database. The reason we did this is so that it is not necessary to walk through task 1 (project creation) before tasks 2 & 3 for our demo. This was also useful for us for testing purposes.

Missing Features

- Q & A for student and teacher:
 - Involves dynamic interaction with the database and AJAX (which we need more time to learn)
- Ability for teacher to view, grade, and send feedback on completed student projects:
- Settings screen and ability to manage account information
- On student landing page, ability to scroll through past and current projects by pictures and icons rather than text
- Dynamic storage of images in the database
 - Allows teacher to submit images for a project that will later be rendered to the student
- Scalability with multiple teachers/classes/schools
- In teacher project creation page, ability to add N number of steps/supplies as opposed to a fixed three
 - We made it three because we didn't know how to dynamically generate a div

- Alerts feature that signals for a teacher when a new question is posted or for a student when a response is posted to a question

Summary

It was a transformative experience to see how our design evolved over the course of the quarter. From an implementation standpoint, we began with almost nil web dev experience but learned a great deal and made a functioning web app targeted towards iPads. This was exciting! While we lacked the time to integrate all our ideal features and design into the end hi-fi prototype, we learned to empathize and design and create from the user's point of view.