electurefy

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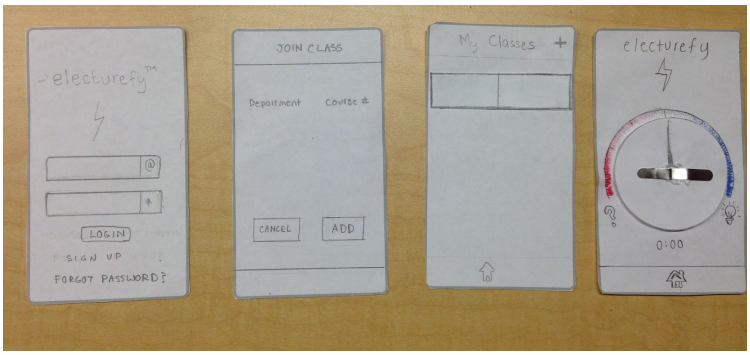
Introduction and Mission Statement

For our usability testing and lo-fi prototype assignment, our team conducted a number of tests with both student and instructor participants in order to gain insight into how users interact with our product.

The electurefy aims to bridge the communication gap between students and instructors. By allowing students to give instant and anonymous feedback, electurefy seeks to create a simple and user-friendly way to make lecture a more effective learning tool. electurefy lets students indicate if they are confused, and relays this information back to the professor, giving instructors actionable data that allows them to adapt lecture to students needs.

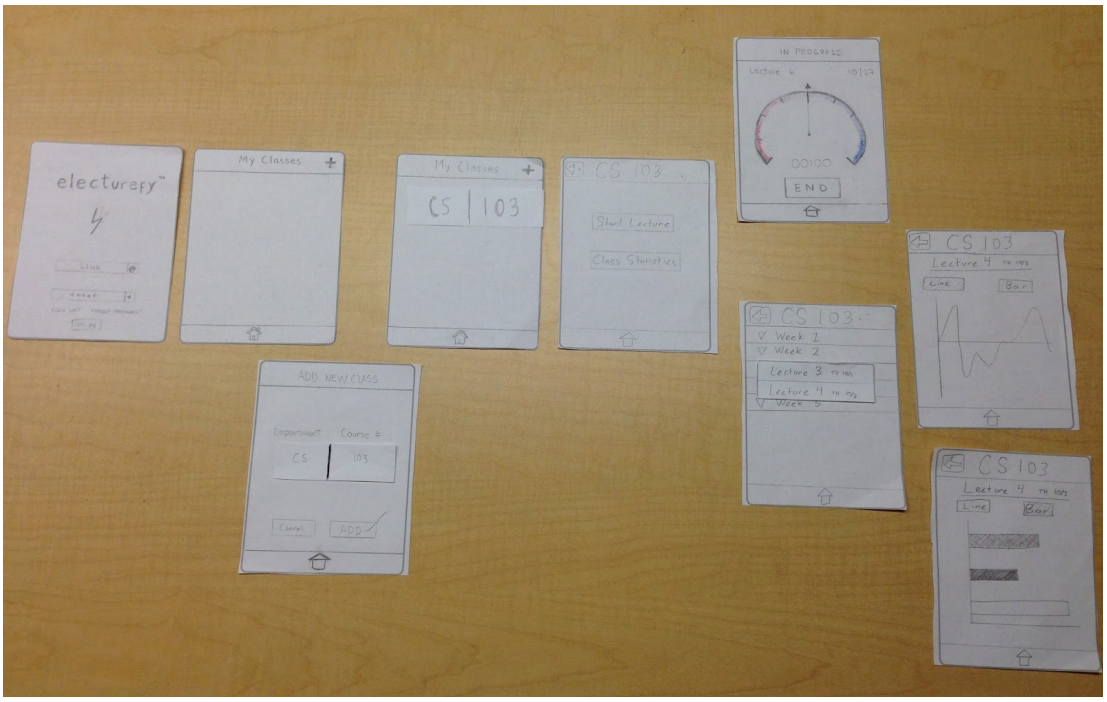
Prototype description

For our prototype we used two different sets of paper cutouts. For our usability testing with student participants, we used 4 iPhone size paper cutouts, which illustrate the 4 main screens that our student users interact with. These 4 screens are the log-in / sign-up screen, the landing screen containing the list of classes, a screen that allows users to join a class, and the speedometer screen to give live feedback. Navigation through these screens simulates a touch-screen device. Student users would first log in with their credentials. After this, students land on the 'My Classes' view, where they are able to see a list of their current primarily, but ideally also their past classes. Then students are able to join a class by clicking on the '+' button, which brings them to a screen where they can add their class. Then student users are able to see this class on their My Classes list, from where they can access the speedometer by clicking on it. All of these screens have a home button bar on the bottom which allows them to quickly go back to the 'My Classes' screen.



For our usability testing with instructor participants, we used 10 iPad size paper cutouts. The sign-in / sign-up screen is the same as the student users. Instructors also land on the 'My

Classes' page where they are able to add a class, using a similar screen to the student users. After they go back the home screen ('My Classes'), instructors are able to click on any of the classes they teach. Here they can either start a lecture or see class statistics, and by clicking on one option, they get taken the appropriate screen. The 'Start Lecture' option takes instructors to the electurefy speedometer, and they can end lecture when it's over. At the same time, when instructors click on the 'Class Statistics' option, they are able to navigate through the lectures, which are paired by week. The entire system has a flow mechanism through back arrows and the home button as well.



Method

Participants

We sought to recruit participants matched our target audience for our two user groups: students and instructors. Our student participant (Participant #1) was a junior majoring in Political Science named Elizabeth. Elizabeth owns an iPhone, but has minimal technical experience. She is a junior majoring in Political Science, and was recruited as a resident of Roble, where one team member's friend works as a Resident Assistant. Our instructor participants were Stanford professors in the Computer Science and English departments - respectively, who are current and past instructors of our team members. We chose instructors from two different fields - one technical and one non-technical - in order to have a more diverse sample of potential users.

Environment

Our student participant was interviewed while she was watching a lecture video in her room. The participant was sitting at her desk with the paper prototype in front of her. Although our product is designed to be used in lecture, we felt that designing a usability study to be implemented during an actual lecture would be potentially disruptive to both the participant

and other students. Thus we felt that simulating a lecture setting by having the student watch a lecture video was an appropriate substitution. Our first professor participant (Participant #2) was interviewed in a common area on the second floor of the Gates Building during a scheduled individual meeting, and our second professor participant (Participant #3) was interviewed in his office in Building 240 during a scheduled individual meeting.

Tasks

Our professor participants were required to complete three tasks of varying complexity. The first task (moderate) was to sign in and then add a class to their (currently empty) list of courses. The task began with the app's login screen, where the users were instructed to login under the assumption that they already had valid login information. After login, the users were taken to a "My Classes" page, which had no current classes displayed. After the participants clicked an "Add" icon, they were taken to an "Add a Class" screen that allowed them to input department and course number information for the class that they are teaching. After completing this first task, the users returned to the "My Classes" home screen, which now contained the class they had just added. The second task (simple) was to start a new lecture session. For this task, the professors began at the "My Classes" screen to which they had just previously navigated. They then had to click on the course they had added in order to navigate to the menu screen for that course. Once at the class menu screen, they users clicked the "Start Lecture" course in order to complete the second task. The third task (complex) was to review agglomerated data statistics after lecture. For this task, the professors first had to end the current lecture session by clicking the "end" button on the lecture session page. After clicking "end", the users were taken back to class menu screen, at which point they had to choose the "Class Statistics" option. After choosing "Class Statistics," they were taken to a screen listing all of the previous lectures for the class. After clicking on the desired lecture, the users navigated to a page with data for student understanding for the specified lecture, thus completing the third task.

Our student was required to complete two tasks. For our student participants, the first task (moderate) was to sign in and then add a class to their (currently empty) list of enrolled courses. This task began with the app's login screen, where the users were instructed to login under the assumption that they already had valid login information. After login, the users were taken to a "My Classes" page, which had no current classes displayed. Once the participant clicked an "add" icon, they were taken to an "Add a Class" screen that allowed them to input department and course number information for the class that they are teaching. After completing this first task, the user returned to the "My Classes" home screen, which now contained the class they had just added. The second task (simple) was to register confusion. Once the student participant had returned to the "My Classes" page clicked on the course they had just added, they navigated to a lecture page with a dial where they could register their confusing / understanding. The participant then watched a lecture video while using the dial to indicate if they were confused by the lecture material.

Procedure

Three of our team members were assigned a participant each. The participants were explained that their input was required for a CS147 class project, and asked to read and sign the consent form. The product was explained as an app designed to provide lecturers with real-time student feedback. The participants were then given a brief demonstration of the app interface, where instructed on what "thinking aloud" sounded like and then given a

chance to ask questions on the process. The tasks were then introduced sequentially, and each task was introduced after the participant had completed the previous task. Throughout the experiment, the team member took careful notes and observations on the time and ease of of response, and reflections thought-out-loud. On average, each procedure took 10 minutes in its entirety.

Test Measures

We looked for a number of things as we observed our participants interacting with the paper prototype. As we were running the usability tests, we measured bottom-line data - such as the time it took participants to complete tasks and the number of errors made by the user as they navigated the tasks. We were also looking other more “big picture” measures of the prototype’s usability. We looked to see where and when the participants hesitated or were confused by the app in order to get a sense of how the users interacted with the flow of the paper prototypes. By observing the ease and comfort with which the users navigated through the interface, we were able to look for a more holistic measure of the paper prototype’s usability.

Results

The student participant sped through each of the tasks very smoothly and even commented on how the process felt self-explanatory. When she was adding her MS&E class to her profile, she said, “I’m guessing I need to press this plus to add a new class” **Severity rating = 0.**

After she added the class and was brought back to the My Classes page, she paused for a little bit before realizing she would had to press the actual class name in order to move onto the feedback page. **Severity rating = 2.**

Once she was redirected to the feedback page, she immediately knew how to give this feedback to the professor. She turned the dial all the way to the right (showing understanding) and said, “Ugh, I want him to go faster.” **Severity rating = 0**.

After the lecture progressed a little more, our student participant dialed it back to neutral and said she was tempted to turn it left (showing confusion) because she didn’t like how the lecture was proceeding **Severity rating = 0**.

For our professor participant, we asked them to perform the same tasks. For the first task, the participants swiftly created a username and password, and intuitively pressed the “+” icon to add a class. However, once they reached the “Add a class” page, one of the professors expressed confusion over what exactly to write in the “Course Name” and “Department” boxes, and expressed his preference for a Dropdown menu that was linked to ExploreCourses, so that he could simply add the class he wanted from there instead of having to choose between the different ways of referring to a single class. **Severity rating = 2**. The other professor participant rather found it very intuitive. **Severity rating = 0.**

For the second task, quickly and intuitively clicked on the created class, and then on the “Start Lecture” button in order to start the lecture.However, the dial screen was problematic for one of our participants. **Severity rating = 3**. He took a significant amount of time to understand

the red versus blue color scheme to indicate confusion versus understanding. He also expressed confusion about whether the dial was indicating confusion (with the extreme right side indicating maximum confusion) or understanding (with the extreme right side indicating maximum understanding). Our second participant found it rather very intuitive to start a new lecture, watch the progress through it, and end the class. **Severity rating = 0.**

For the third task, the participants reached the statistics page easily. One of the participants found it intuitive to navigate between the different graphs. The other participant found it not very intuitive to find the lecture within the right week, since there was not a very clear way of telling the number of lectures per week. At the end, he ended pressing the wrong week. **Severity rating = 1**.

Discussion

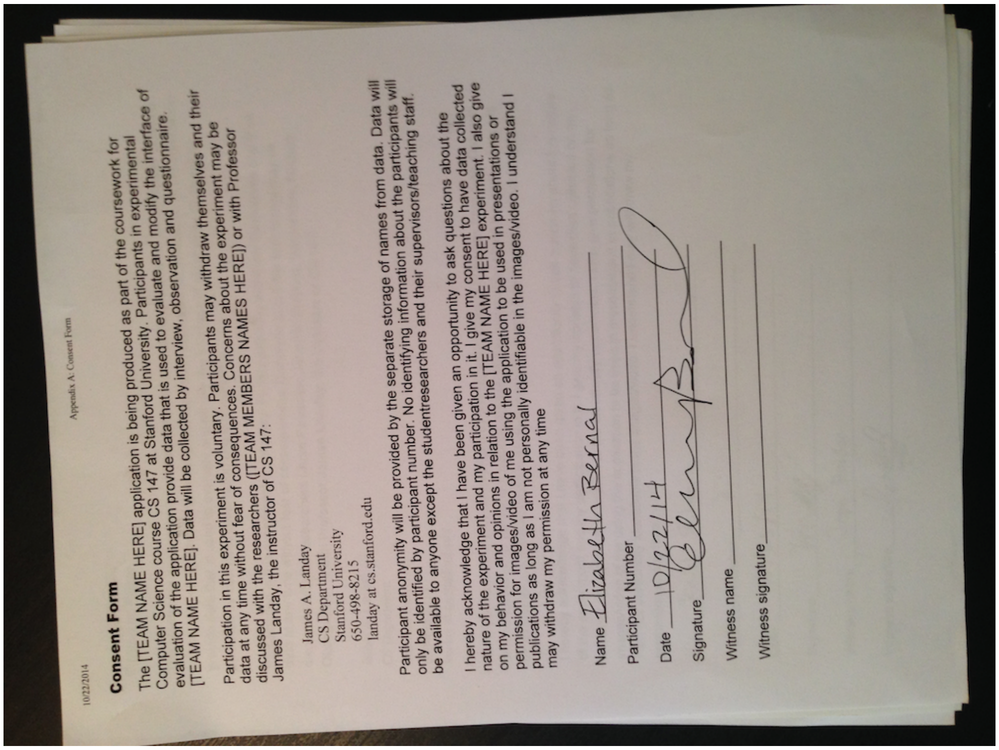
As a result of this experiment, we obtained significant suggestions for improvement, as described below:

- ➔ Notifications indicating to the user that a class was sucessfully added to “My Classes” would more clearly illuminate to the user that they had completed the task.
- ➔ Our UI should implement affordances that suggest to the user that they can click on the class in order to view class-related options.
- ➔ The dial indicating the confusion aggregate to professors should be more explicit and contain more affordances. A green checkmark versus a red cross, for example, would possibly make more sense to indicate understanding versus confusion than our present layout for the dial interface.
- ➔ A more intuitive organization for the lectures by week is required.
- ➔ The app should perhaps incorporate an “current average” graph in addition to the weekly graphs, so that the lecturer could analyze trends in understanding over time.

Overall, we found that the usability tests did an excellent job of illuminating potential strengths and weaknesses in our interface. The information gained from these test will help us retool and refocus our interface as we move into higher fidelity prototypes.

Appendix

Consent forms


10/22/2014 Appendix A: Consent Form

Consent Form

The [TEAM NAME HERE] application is being produced as part of the coursework for Computer Science course CS 147 at Stanford University. Participants in experimental evaluation of the application provide data that is used to evaluate and modify the interface of [TEAM NAME HERE]. Data will be collected by interview, observation and questionnaire.

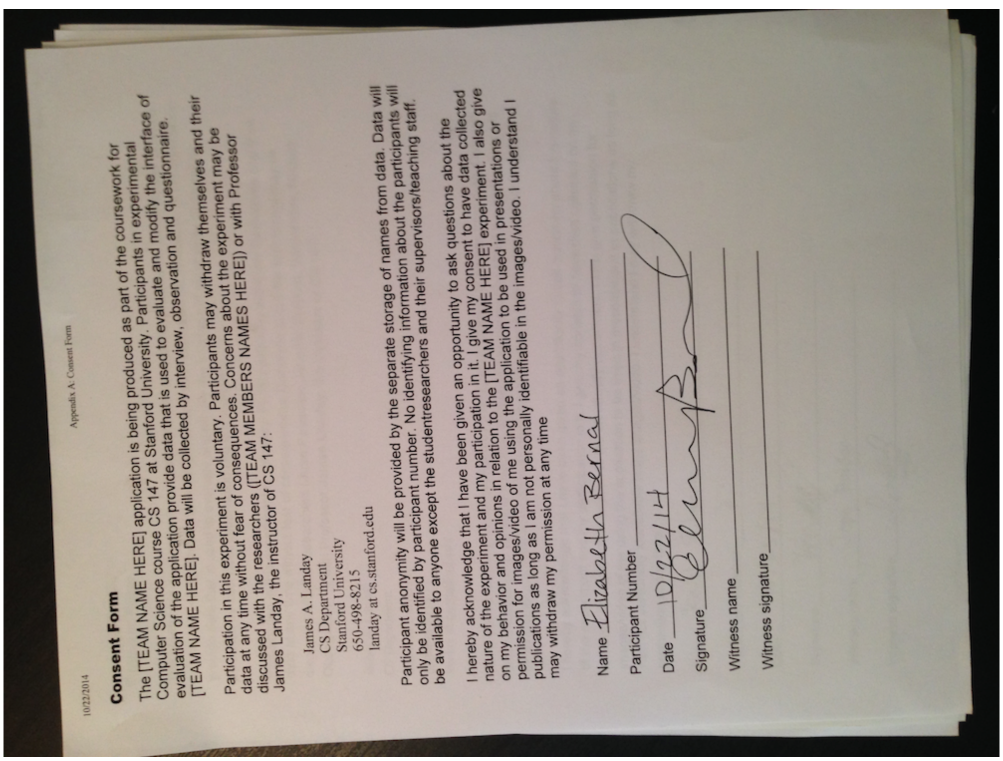
Participation in this experiment is voluntary. Participants may withdraw themselves and their data at any time without fear of consequences. Concerns about the experiment may be discussed with the researchers ([TEAM MEMBERS NAMES HERE]) or with Professor James Landay, the instructor of CS 147:

James A. Landay
CS Department
Stanford University
650-498-8215
landay at cs.stanford.edu

Participant anonymity will be provided by the separate storage of names from data. Data will only be identified by participant number. No identifying information about the participants will be available to anyone except the studentresearchers and their supervisors/teaching staff.

I hereby acknowledge that I have been given an opportunity to ask questions about the nature of the experiment and my participation in it. I give my consent to have data collected on my behavior and opinions in relation to the [TEAM NAME HERE] experiment. I also give permission for images/video of me using the application to be used in presentations or publications as long as I am not personally identifiable in the images/video. I understand I may withdraw my permission at any time

Name Elizabeth Bernal
Participant Number
Date 10/22/14
Signature
Witness name
Witness signature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Name Elizabeth Bernal
Participant Number
Date 10/22/14
Signature
Witness name
Witness signature

Consent Form

The ELECTUREFY application is being produced as part of the coursework for Computer Science course CS 147 at Stanford University. Participants in experimental evaluation of the application provide data that is used to evaluate and modify the interface of ELECTUREFY. Data will be collected by interview, observation and questionnaire.

Participation in this experiment is voluntary. Participants may withdraw themselves and their data at any time without fear of consequences. Concerns about the experiment may be discussed with the researchers (Nikhita Obeegadoo, Jennifer Farman, Daniel Hok, Juan Posadas Castillo) or with Professor James Landay, the instructor of CS 147:

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Name Alexander Key

Participant Number 9

Date 22 Oct 2014

Signature

Witness name

Witness signature