

Product Redesign for a Cross-Disciplinary Userbase

Steven J. Castellucci

Methods Used:

- User/stakeholder interviews
- Content audit
- Competitive analysis
- Collaborative design
- Surveys
- Metrics/log analysis

Research Composition (est.):

70%	30%
Primary	Secondary
80%	20%
Generative	Evaluative

Overview

- Summary

I served as the Director of a computer course within the Electrical Engineering and Computer Science (EECS) department. One of my responsibilities was to redesign this course (the product) to be relevant to a large cross-disciplinary audience.

- Users and Stakeholders

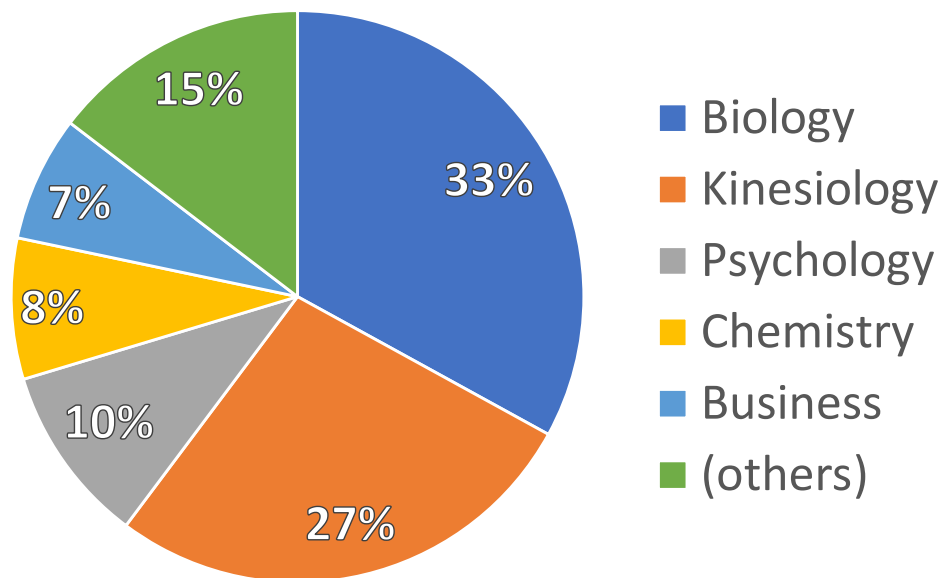
- Students with diverse backgrounds from multiple departments
- Reps from the students' respective departments
- Course instructors

- Pain Points

- Outdated content and low student engagement
- Biology dept. considering a replacement course, which would mean significant loss of userbase and funding for EECS dept.

Who are our users?

- Outdated and incomplete information on userbase demographics; anecdotally Biology dept. was the largest client (i.e., largest group of students in our userbase)
- I performed a log analysis on the enrolment data to identify our userbase and determine the stakeholders



What are their needs?

- From stakeholder interviews with dept. reps
 - Big data mining with R programming
 - Computer system administration
 - Image editing, video production, and web authoring
 - Digital security, with risks and countermeasures
 - Presentation skills
- From user interviews with students
 - Elimination of expensive, bulky textbooks and lab manuals
 - Engaging, relevant lectures
 - More practical assignments
 - Better understanding of technology when buying PC hardware
 - Accommodation of students' busy schedules

How do we meet their needs?

- I performed a content audit to assess the current product offering and determined how to address as many user and stakeholder needs as was practical
- Added or updated
 - Computer system administration
 - Buying a computer
 - Image editing and web authoring
 - Digital security, with risks and countermeasures
 - Presentation skills
- I informed dept. reps that big data, data mining, and R programming each exceeded the scope of this course, and would be better served by dedicated senior-level courses

How do we deliver content?

- Competitive Analysis for teaching methodologies
 - Asymmetric learning
 - Allows users to consume or review lecture material any time after the original lecture; an agile approach that conforms to the user's schedule
 - I adopted this approach throughout the course; the ability to record and share lecture recordings was already available
 - Flipped classroom
 - Reverses the traditional paradigm; users consume pre-recorded lessons on their own time, and attend lectures to complete assignments that reinforce the teachings
 - I produced videos and assignments for only four flipped classroom sessions; there was insufficient time and resources to produce videos, write assignments, and train fellow instructors
- Learning Management System (LMS) for digital distribution of course materials, eliminating printed textbooks and manuals

Resolving Stakeholder Conflict

- The History of Computing module (3 hours)
 - **Dept. Reps:** Remove it to make room in the schedule
 - **Sr. Instructors:** Keep it, we know what's best
 - **Students:** The topic is unrelatable
- My compromise
 - Keep but reduce to 1 hour, making room in the schedule
 - Rewrite module to highlight contributions of women and LGBT individuals (e.g., Lynn Conway, Alan Turing, and the original ENIAC programmers)



User Responses

I just wanted to thank you for including all the women pioneers in our course. I don't know if its [sic] the course requirements or you choose to do so but I really appreciate it! As a women [sic], I've always wondered why not many women showed up in my textbooks or why I wasn't taught much about women as about men. I'm surprised at all the women involved with history of computing and I'm grateful that you chose to make women stand out in our course.

— Nitnem G.

The best things about this course are that the professor is extremely clear in explaining the information to the students, and that he provides a lecture recording. With out [sic] those recordings I wouldn't have been able to excel in the class the way I did. I am someone who is constantly ill and learns best when I hear the information being explained with various comparisons.

— Anonymous survey response

User Responses (cont.)

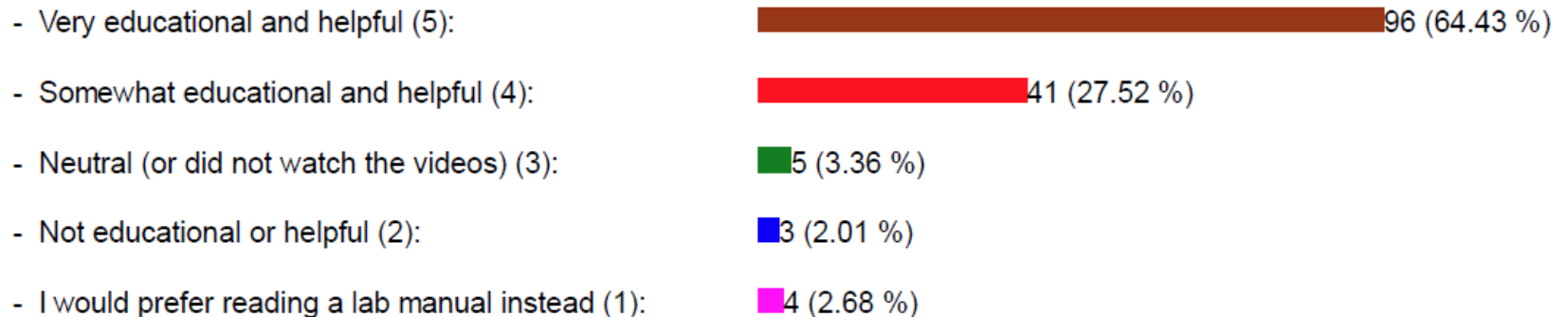
The flipped classroom videos that my prof made were really good. The revamp of this course was a massive improvement over when I took it two years ago.

— Anonymous survey response

The changes made to this course from last year were very beneficial. After discussing the current course with friends who took this course last year, I feel huge improvements were made.

— Anonymous survey response

() What do you think of the course videos?



Deliverables

- Revised curriculum, new topics, and learning objectives
- Complete migration to an LMS to manage course content and logistics
- Online videos to implement the flipped classroom methodology and to facilitate asymmetric learning [[Playlist on YouTube](#)]
- New assignments to thwart student plagiarism
- Inclusive approach to presenting the history of computing [[Lecture Recording](#)]

Insights and Outcomes

- Updated userbase demographics (previous knowledge was anecdotal and incomplete)
- Over 90% positive user feedback on new course videos
- Course participation increased 47%, as measured by assignment submission metrics
- Exam results increased 12%, suggesting better retention of the subject matter
- Buy-in from Biology program for continued use of the course; no decrease in funding for EECS department