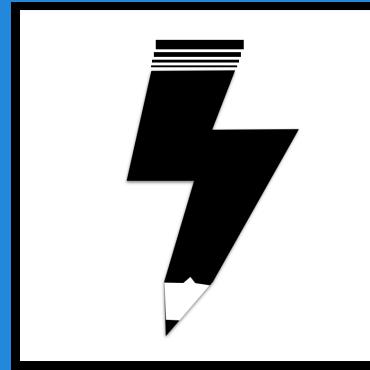


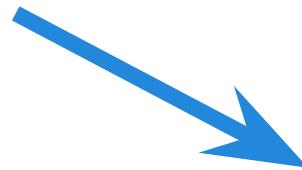
# electurefy



Jenny Farman | Daniel Hok  
Juan Posadas

# Overview

# Lecture



# Effective learning tool

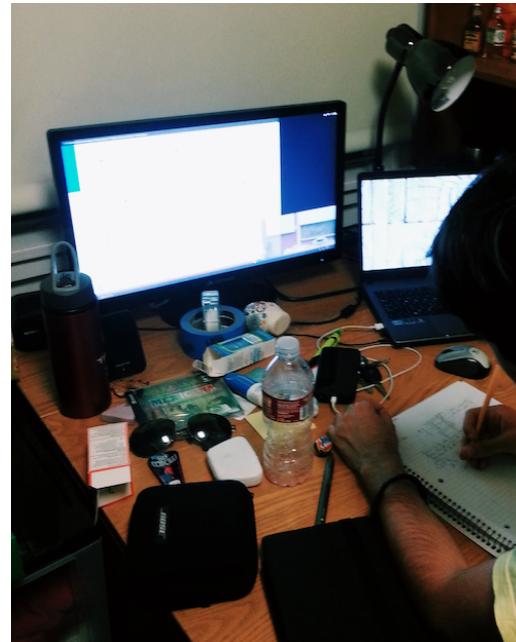
# Problem & Solution Overview

- Difficult to communicate with professor
- Intimidating lecture setting
- Lack of integration between lecture and assignments other course material
- Real-time feedback and analytics

# Contextual Inquiry

## Participant #1 – J.B.

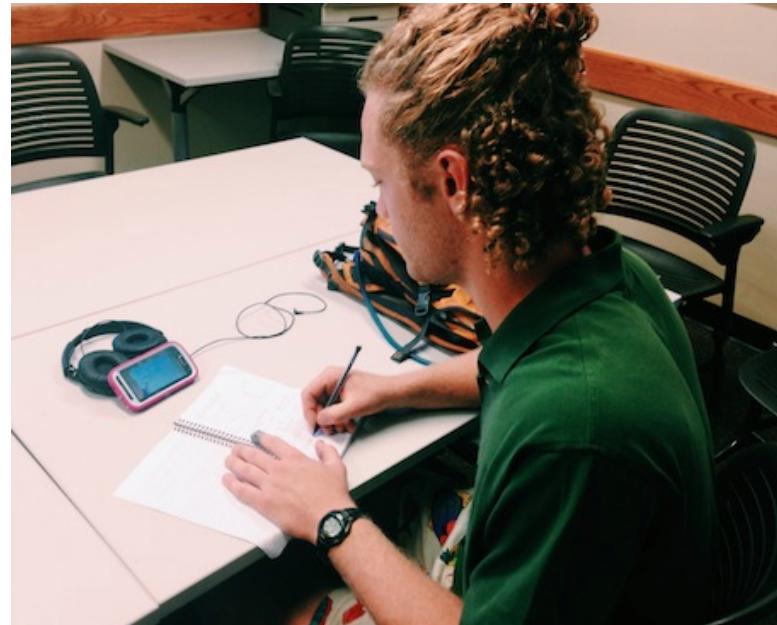
- 18-25, Junior, ME
- Typically attends lectures
- Quiet in lecture setting



# Contextual Inquiry

## Participant #2 – K.C.

- 18-25, Coterm, CS
- Technical background
- TA for CS 103



# Contextual Inquiry

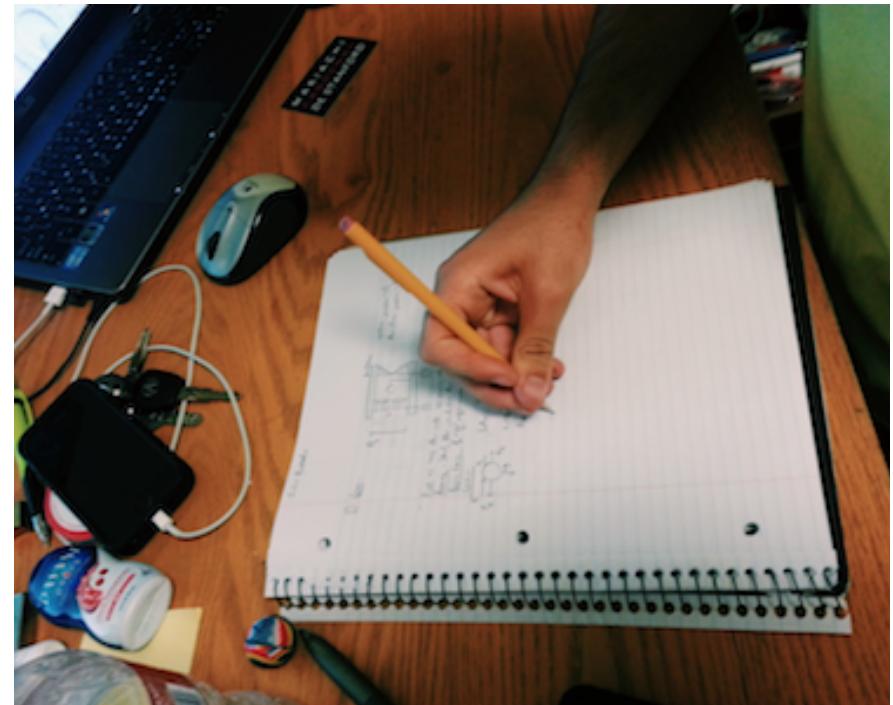
## Participant #3 – J.D.

- 18-25, Senior, MCS
- Software Developer
- Eager to give feedback



# Contextual Inquiry Results

- Took handwritten notes to review later
- Access to mobile devices in lecture
- Frustration with content or organization of lecture
- Reluctance to share non-anonymous feedback



# Task Analysis Results

## 1. *Who is going to use the system?*

- Students who attend or watch lectures

## 2. *What tasks do they now perform?*

- Note taking, referencing course materials

## 3. *What tasks are desired?*

- Rapid, anonymous feedback → professor adapts
- Easier navigation through material / lecture videos

# Task Analysis Results

## ***4. How are the tasks learned?***

- Trial and error, routine, preference

## ***5. Where are the tasks performed?***

- In lecture, mobile device, online lecture platform

# Task Analysis Results

## 6. *What's the relationship between customer & data?*

- Lots of data lost due to lack of immediate feedback
- Lack of data that helps students navigate through online lecture videos.

## 7. *What other tools does the customer have?*

- Class evaluations, Piazza, pen and paper, in-person communication with professor

# Task Analysis Results

## ***8. How do users communicate with each other?***

- Difficult to talk to teachers; students discuss lecture with peers both in person and online (social media, Piazza)

## ***9. How often are the tasks performed?***

- Class schedule determines # of lectures

# Task Analysis Results

## ***10. What are the time constraints on the tasks?***

- Students need to stay up-to-date with lecture videos / course materials

## ***11. What happens when things go wrong?***

- No communication → confusion on concepts

# Representative Tasks

Clarify questions  
and solidify  
understanding of  
course topics



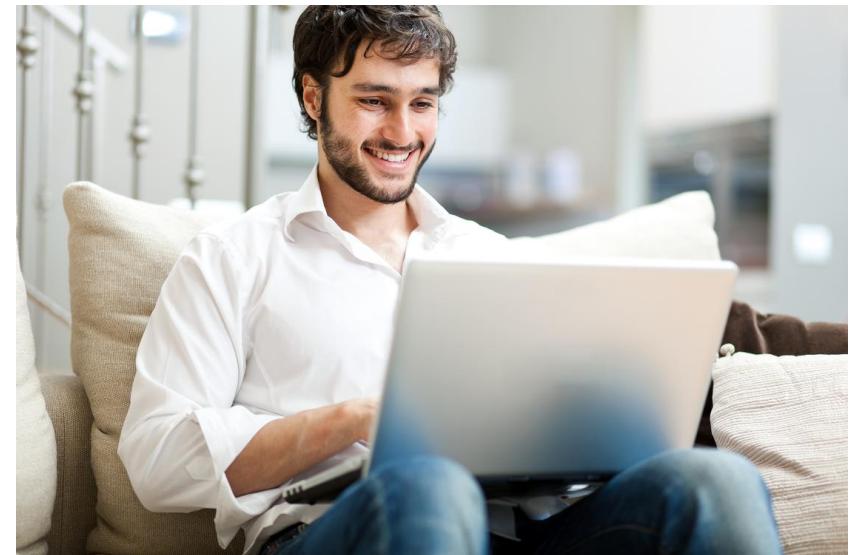
# Representative Tasks

Influence pace,  
content, or  
organization of  
course lectures



# Representative Tasks

Stay engaged and up-to-date with lecture videos and course materials

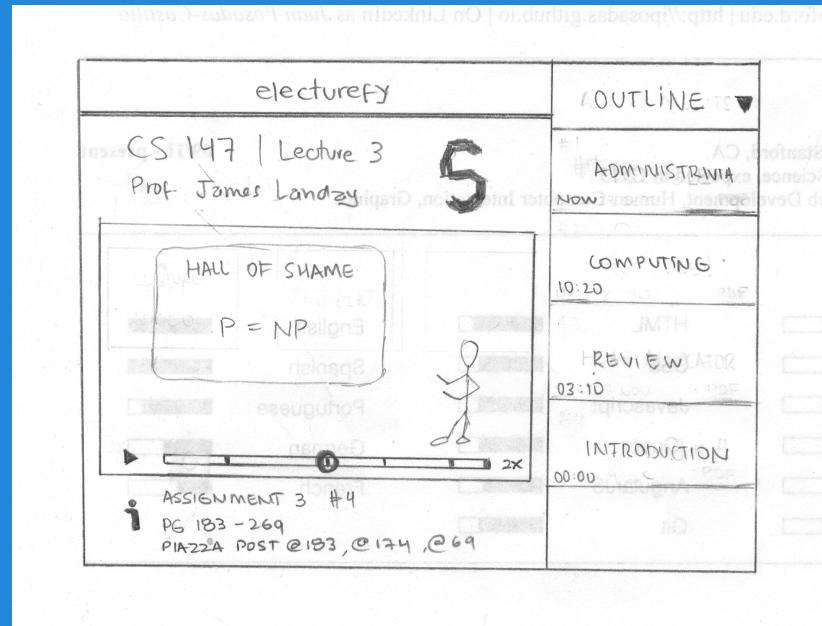
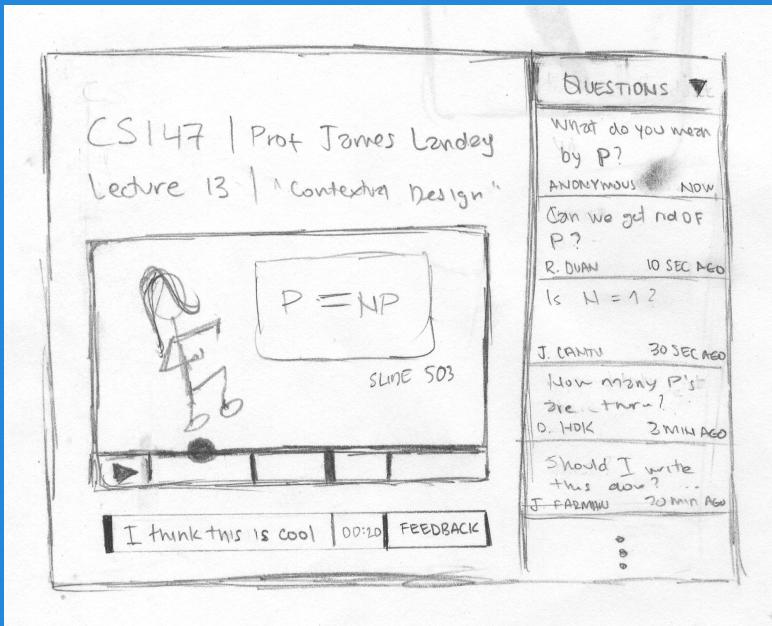


# Application Ideas

# Time-stamped Feedback System

- Users enter questions / comments in real time as they watch lecture videos
- Time-stamped feedback corresponds to lecture video (i.e. Soundcloud comments)

# Design sketches

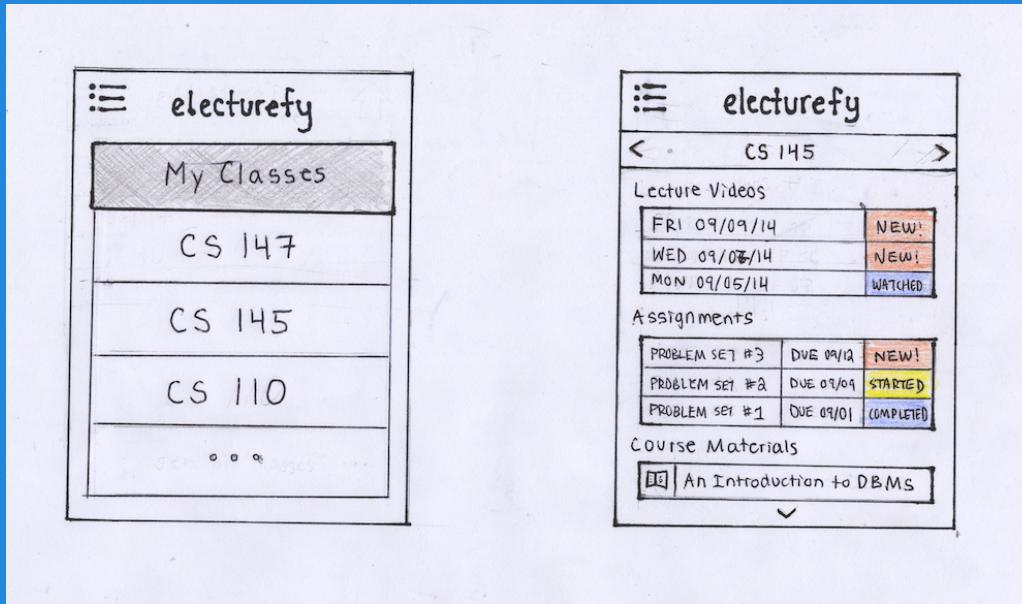


Design Idea #1 - Time-stamped feedback / questions

# Integrated Course Materials Platform

- Connects relevant sections of course materials / lecture video
- Helps to solidify understanding
- Requires staff to populate content

# Design sketches



Design Idea #2 – Integrated platform for course materials / feedback

# Design sketches

lecturefy

CS 145 An Introduction to DBMS

CHAPTER 8 INFINITE SEQUENCES AND SERIES

Since  $|f'''(x)| \leq n(n-1)(n-2) \cdot \dots \cdot 2 \cdot 1$ , we know that  $\frac{1}{n!} |f'''(x)| \leq 1$  for all  $n$ . So we can take  $M = 1$  in Taylor's Theorem.

$|R_n(x)| \leq \frac{M}{(n+1)!} |x^{n+1}| = \frac{|x|^{n+1}}{(n+1)!}$

By Equation 10 the right side of this inequality approaches 0 as  $n \rightarrow \infty$ , so  $|R_n(x)| \rightarrow 0$  by the Squeeze Theorem. It follows that  $R_n(x) \rightarrow 0$  as  $n \rightarrow \infty$ , so  $\sin x$  is equal to the sum of its MacLaurin series by Theorem 8.

We state the result of Example 4 for future reference.

**LEMMA 8.1** (Maclaurin Series) If  $f$  is differentiable infinitely many times at  $x = 0$ , then the MacLaurin series for  $f$  converges to  $f$ .

**SOLUTION** We could proceed directly as in Example 4, but it's easier to differentiate the MacLaurin series for  $\sin x$  given by Equation 8.

$\sin x = x - \frac{x^3}{3!} + \frac{x^5}{5!} - \frac{x^7}{7!} + \dots$

$= x - \frac{x^3}{3!} + \frac{x^5}{5!} - \frac{x^7}{7!} + \dots - 1 + \frac{x^3}{3!} - \frac{x^5}{5!} + \frac{x^7}{7!} + \dots$

The MacLaurin series for  $\sin x$  converges to 0. By Theorem 2 in Section 8.6 we can use the differentiated series for  $\cos x$  also converges to 1. Thus

$\cos x = 1 - \frac{x^2}{2!} + \frac{x^4}{4!} - \frac{x^6}{6!} + \dots$

For more on this topic see:

- Lecture 09/21/14 on SCPD
- A Guide to Functions (pdf)
- Question #142 on Piazza

The power series we obtained by indirect methods in Sections 8.4–8.6 are called the Taylor or MacLaurin series of the function.

lecturefy

CS 145 Video: Monday, September 29, 2014

1. SQL

- 1.1 m
- 1.2 m
- 1.3 m
- 1.4 m
- 1.4.1 m
- 1.4.2 m
- 1.4.3 m
- 1.5 m
- 1.6 m
- 1.7 m

2. Constraints

- 2.1 m
- 2.2 m
- 2.2.1 m
- 2.3 m

For more on this topic see:

- Textbook section 1.7 (p. 285)
- PSET 3, Problem #2
- SQL Practice Quiz
- Question #142 on Piazza

Stanford

Speed Resolution

DROP PIN

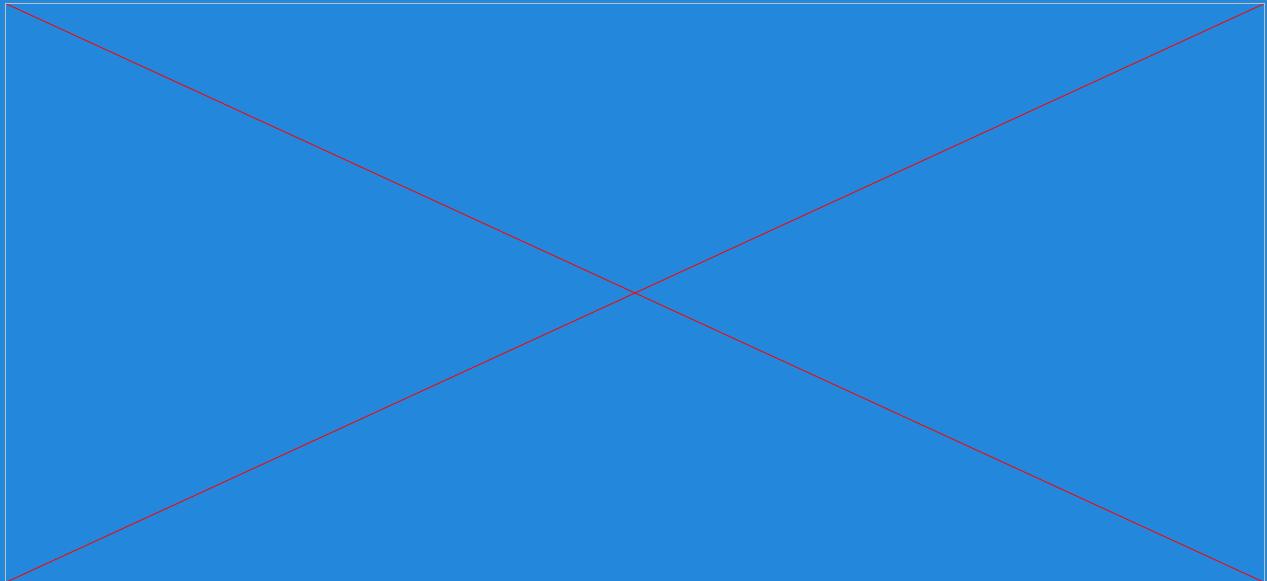
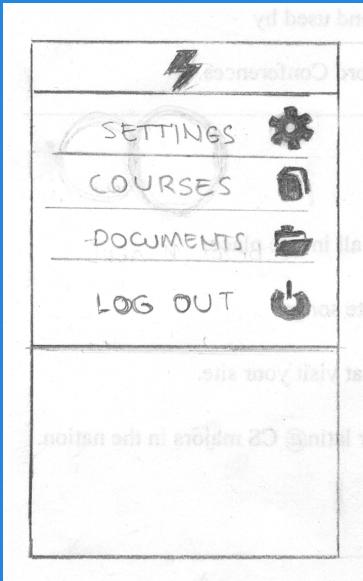
ASK A NEW QUESTION

type your question here...

# Real-time Lecture Feedback

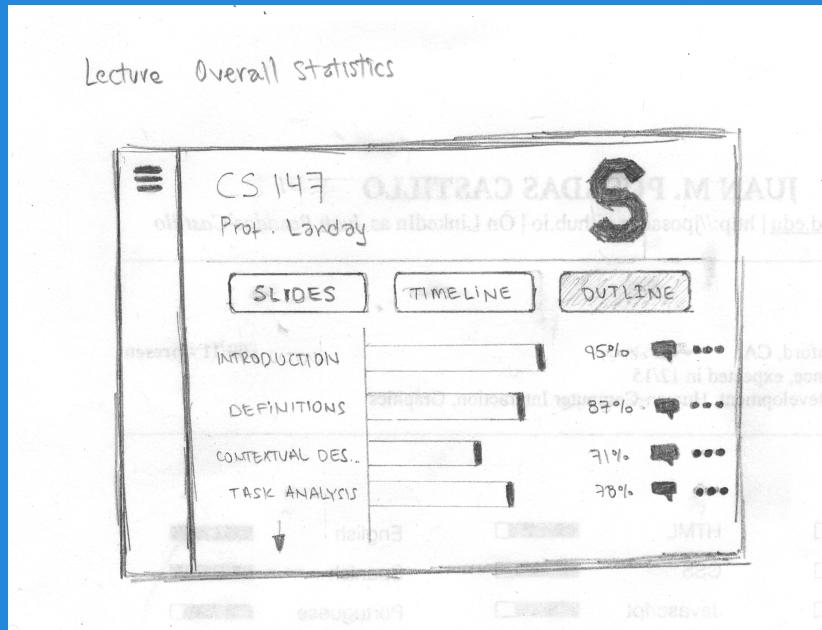
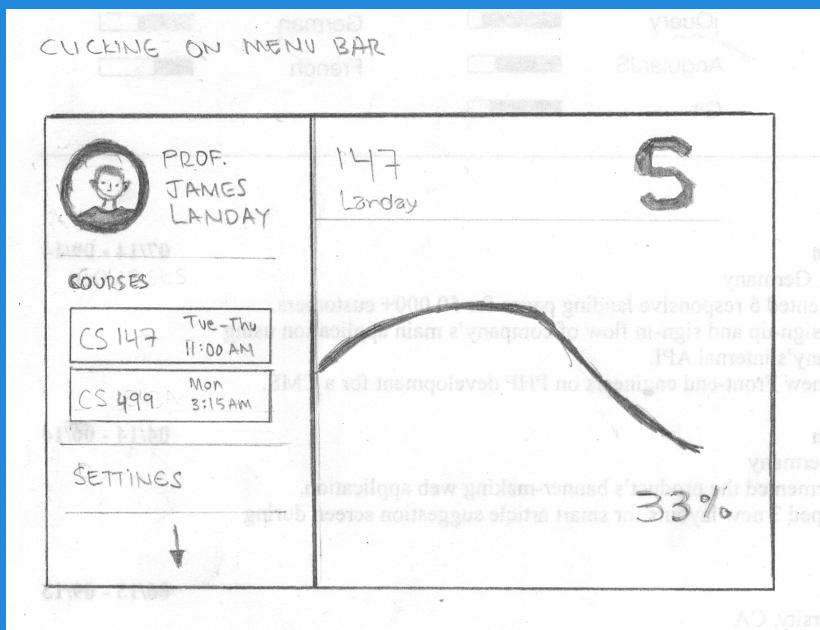
- In-class immediate customer feedback
- Gives students the ability to change lecture dynamics in real time
- Cross-platform implementation

# Design sketches



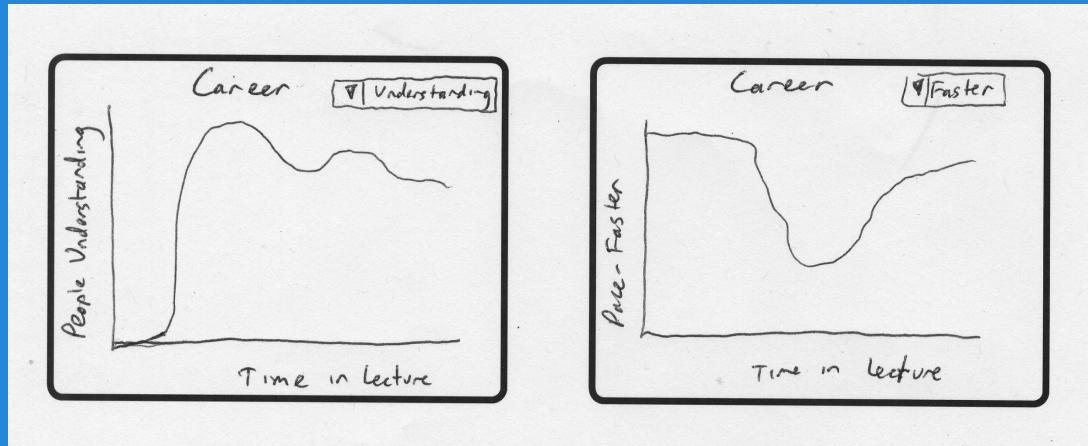
Design Idea #3A – Real-time lecture feedback

# Design sketches



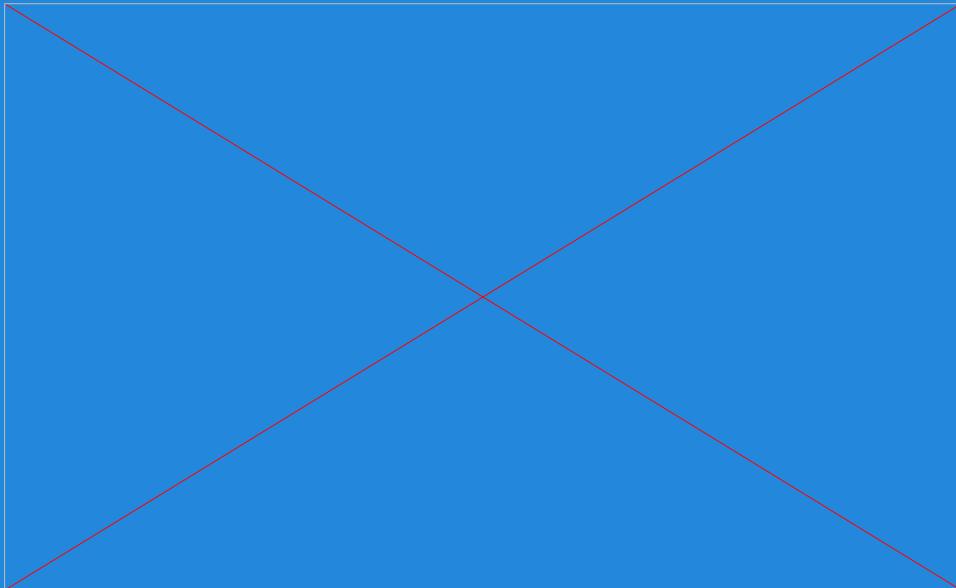
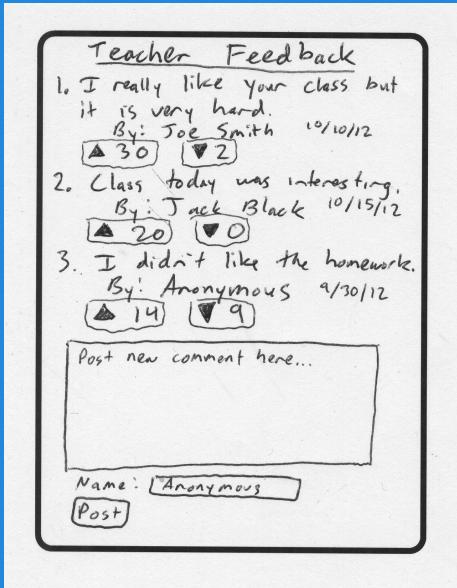
Design Idea #3A – Real-time lecture feedback

# Design sketches



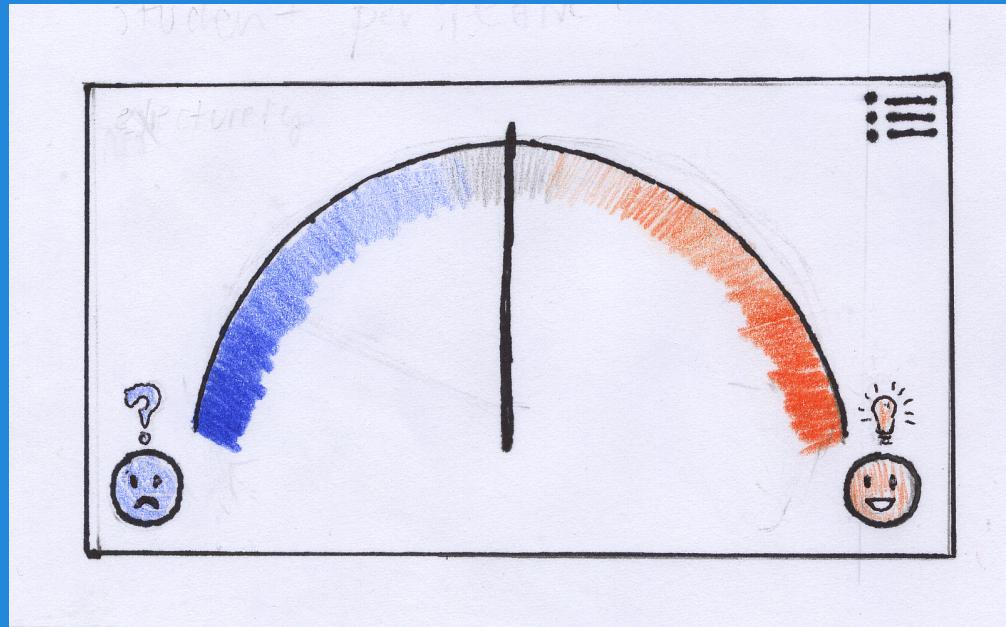
Design Idea #3B – Real-time lecture feedback

# Design sketches



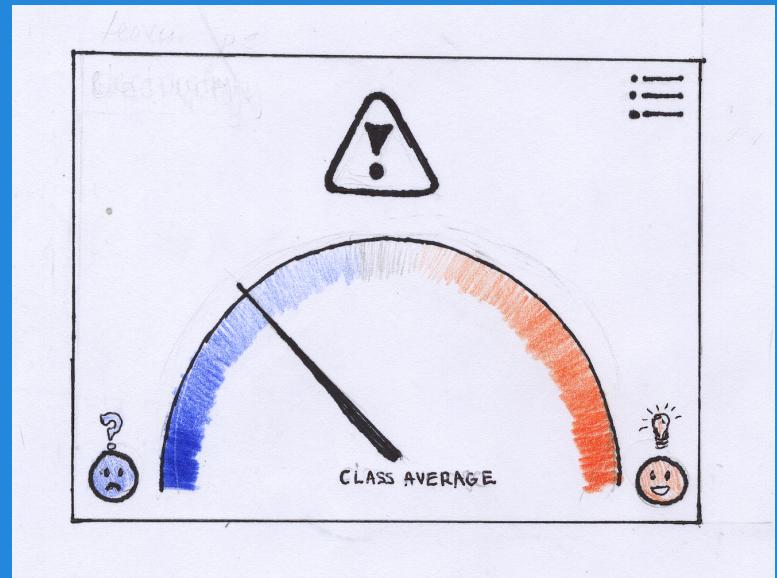
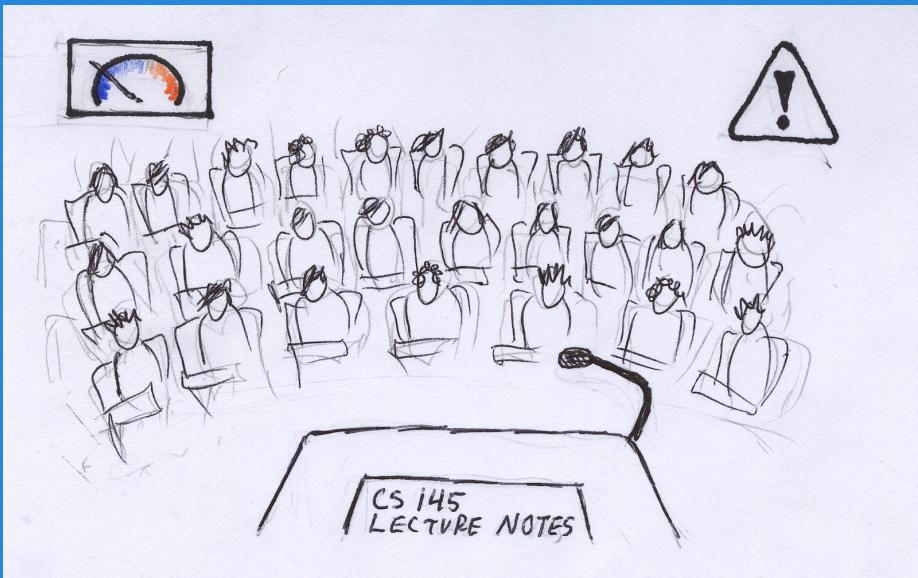
Design Idea #3B – Real-time lecture feedback

# Design sketches



Design Idea #3C – Real-time lecture feedback

# Design sketches



Design Idea #3C – Real-time lecture feedback

# Summary

- Problem: lecture communication
  - Solution: real-time feedback system
- 
- Helps students influence their learning environment and clarify points of confusion
  - Constructive & actionable for teacher

Thank you.

electurify

