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Problem Domain: Improving the modern college classroom experience.

We think this is an interesting domain because from our first round of interviews with college students, we found out that they have all experienced being just talked at in lectures, which made their learning experiences very unpleasant; while they all enjoyed some other courses where the classes were interactive in one way or another and they felt they learnt better in those interactive classes. Therefore, designing for improving modern college classroom experience by enhancing interactivity is very meaningful.

Initial Points of View

It would be game changing if we could make students more engaged in class and maintain that level throughout four years.

Additional Needfinding Results

As we focused on in-class college education, we interviewed one more college student and a college professor.



The empathy map for Chris, a college student at a public university:

Do <ul style="list-style-type: none">• He went to an econ class and a Japanese class• Kept swearing out of frustration, rolling eyes	Think <ul style="list-style-type: none">• He thinks that he learns better in classes that are interactive• He thinks he enjoys learning when it is effective.
Say	Feel <ul style="list-style-type: none">• Frustrated about the econ class

<ul style="list-style-type: none"> • “Today the professor talked a lot... I wish we had it f**king recorded — not very related to a lot of it” • “I feel engaged, actually learning, actively learning (in Japanese class). In econ I have to go over it again, I don’t absorb much, don’t get much by just sitting there and listening.” • “I think if used right tech can be good — it all depends on how well we utilize... sometimes even a negative effect.” • “Only with two clicker classes... it didnt seem to make me more engaged, only three or four times to look up and do it” 	<p>where he just sits down and listen to professors.</p> <ul style="list-style-type: none"> • Uncertain about using tech in-class interaction • Enjoys feeling like he learned something • Likes classes more for the learning experiences vs. the material (enjoyed Japanese more than econ, his major)
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The empathy map for the college physics teacher:

<p>Do</p> <ul style="list-style-type: none"> • Recently adopted Clickers in his class • Talks with enthusiasm 	<p>Think</p> <ul style="list-style-type: none"> • He thinks that he need methods to keep students engaged, especially when teaching “boring” materials • He thinks that an interactive platform helps with focusing students on the lecture.
<p>Say</p> <ul style="list-style-type: none"> • “Students often get bored in long lectures, especially with topics as dry as mechanics and electromagnetism.” • “Clicker questions are a great way to bring them back into focus” • “The students can answer questions and discuss the solutions and it really wakes them up and renews their energy!” 	<p>Feel</p> <ul style="list-style-type: none"> • Enthusiastic about using technology to improve the interactivity of his class.

From the additional interviews and analysis on the data collected, we we came up with several new points of view, which are presented in the following section.

Revised Points of View

1. We met a college student who is taking an inverted classroom course, we were surprised to find out that the inverted classroom was working for him, it would be game changing if we could introduce better social interaction in the classroom in all classes and make lecture more of a social activity.
2. We met a college student, we were surprised to find out that he learns best when there is a variety of activities instead of just being talked at, it would be game changing if we could make the classroom more engaging and hold professors accountable for the way they teach.

“How might we...?”

1. We met a college student who took an inverted classroom course, we were surprised to find out that the inverted classroom was working for him, it would be game changing if we could introduce better human interaction in the classroom.

- How might we make inverted classroom more fun?
- How might we increase student-teacher interaction in class?
- How might we make inverted classroom more engaging?
- How can we make lectures more bearable?
- How might we incorporate tech into inverted classroom?
- How might we make normal class more engaging?
- How might we introduce a variety of teaching styles?
- How might we make better interaction between teacher and students?
- How might we change teaching style?
- How might we increase student-to-student interaction?

2. We met a college student, we were surprised to find out that he learns best when there is a variety of activities instead of just being talked at, it would be game changing if we could make the classroom more engaging.

- How might we introduce engaging activities in class?
- How might we make professors more engaged in teaching
- How might we going to class incentivized?
- How might we we find out if a student is really engaged in class?
- How might we make use of social interaction to engage?
- How might we enhance students' motivations to go to class?
- How might we make classes more engaging to students?
- How might we make students feel like the class is worth it?
- How might we remove being talked at?
- How might we make a talk/lecture seem fun?
- How might we encourage professors to interact with students?

Our favorite HMWs

- How might we increase student-to-student interaction?
- How might we make better interactions between teachers and students?
- How might we make professors more engaged in teaching?

Brainstorming Solutions for HMWs

-How might we increase student-to-student interaction?

- Bluetooth groups
- Collaborative notebook
- Team clicker
- Study and hobby group
- Anonymous ranking of questions in real time
- Reward system for answering questions
- Facebook app
- Mobile app
- Study tinder
- Endorsement of active students or recommendation to companies

-How might we make better interactions between teachers and students?

- Real time feedback in class
- Anonymous reporting “stuck here”
- Instantaneous Piazza
- Gamify lectures
- Feedback after each class
- Real time TA comments
- Face analytics program to tell students’ engagement level
- Time based feedback
- Real-time poll system
- Lights lighting up when a student feels confused and presses a button

-How might we make professors more engaged in teaching?

- Forum
- Incentives to teach
- Feedback linked to salary
- Real-time feedback
- Students decide a part of lecture
- Teacher do something new in every class
- Tenure based feedback
- Meet one student per lecture
- Student engagement evaluation tool
- Stars ranking after each lecture
- Panic button

Our Favorite Solutions

- Collaborative notebook
- Anonymous ranking of questions in real time, Yik-Yak style
- Anonymous reporting “stuck here”

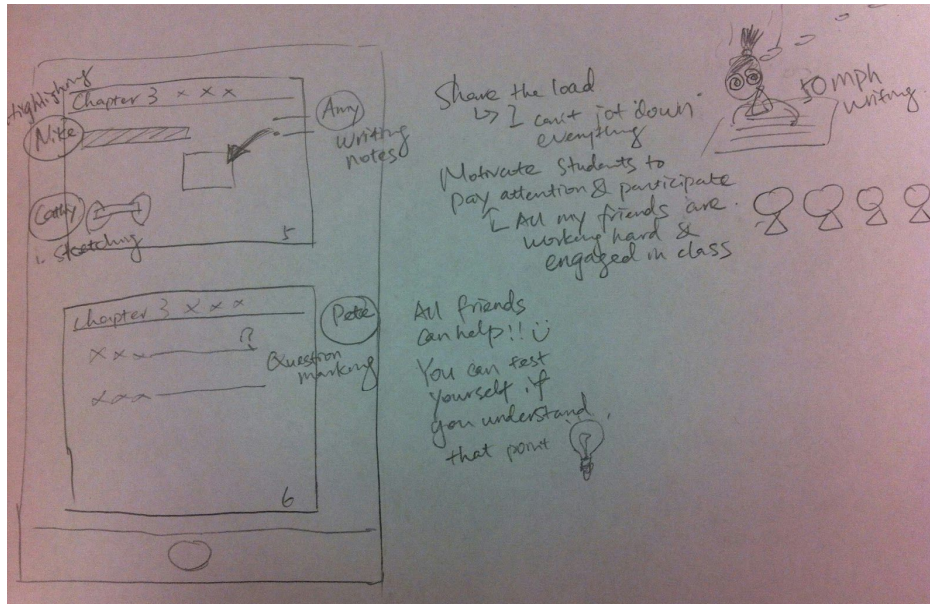
Experience prototypes

Prototype 1: collaborative notebook in class

Assumption:

- Students want to have more interaction with other students in class

Minmin used a sketch (see below) to communicate the experience to her friend Caitlin. "Imagine you are in one of the boring classes that you have taken. Now imagine you have this collaborative notebook..."



Caitlin liked the idea of being able to share notes with peers:

“I like the idea of sharing the notes. Sometimes when I take notes in class, and I go back to read it, I don’t understand what I meant by that. It would be great if my friends got what the Professor was intending to say in class and wrote it down.”

“Some classes were not interactive, and I felt bored, and then I got distracted. This could make the class more interactive if designed right.”

However, she was also concerned:

“But I am worried that I can get distracted. I want to hear what the professor is saying in class. All the stuff is happening on the computer could be distractive. Also, being on computer is distractive sometimes. ”

“I want to take notes that are important to myself. Mike may be writing notes that are important to him. Mike and I may think differently.”

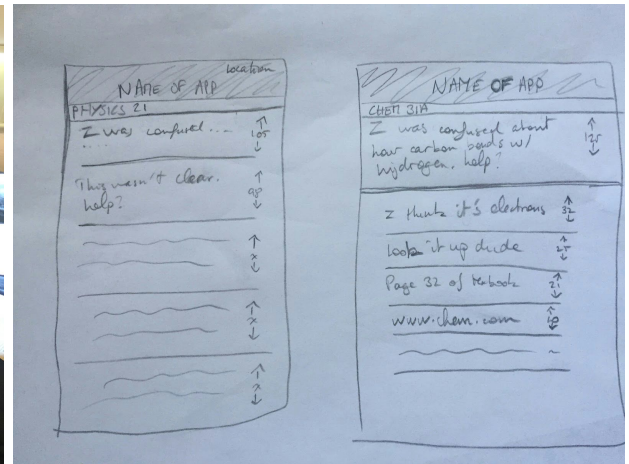
The initial assumption that we made was valid because Caitlin likes the idea of collaborative note-taking and she thinks that sharing notes can make the learning experience more interactive. However, Caitlin also expressed the worry of being distracted by the platform. Learning from this experience prototype is that students want more interaction in class but at the same time they don’t want get distracted by the interaction.

Prototype 2: anonymous ranking of questions in real time (yikyak)

Assumptions:

- Some questions will be more pressing than others, and those questions should be answered sooner, and students want to be able to collaborate with their classmates on things they’re stuck in.
- Anonymity is important because students may not want their name associated with the question, but they still want to ask it. Students do not want to seem dumb to their peers.

Andres used a paper prototype to run through the context with three stanford students, talked them through the experience, and figured out what they would like to see and what they enjoyed.



All the three students thought the idea was really interesting, and that mobile app makes it easily accessible. They would use it if they got confused in class.

“Pretty much if you’re confused about something, odds are that other people are confused too, so the question should already be there.”

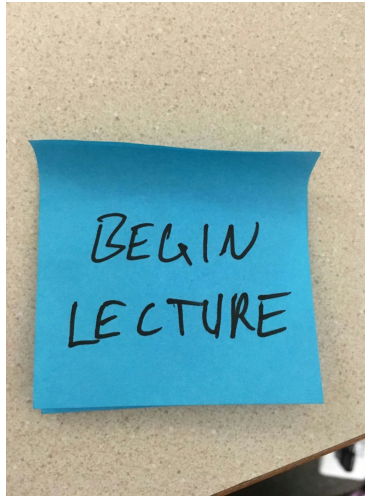
The assumptions are valid because the three students liked the experience prototyping. Learning from the experience prototyping: they suggested a bot that crawls the internet searching answers to questions.

Prototype 3: anonymous reporting “stuck here”

Assumptions:

- Students are intimidated to ask questions in class and have their name associated with that question, but they may still be totally lost.
- The professor wants to know what students do and don’t understand during lecture.

We used sticky notes to communicate the experience to a Stanford Physics student, Max.



Max liked the idea in that

"It's really valuable for the professor to know when kids don't understand something collectively."

"Showing the kids who else got stuck could be good, could also feel shitty when nobody else says help too."

"The ability to go back and replay would be really really useful...I'd learn so much better because I can watch at my pace."

But Max also has concerns:

"Having your phone out while in class is probably distracting, maybe the app could lock phone."

"Maybe the psychology behind the infographic will mess with people's heads. Save graph till afterward class."

The first assumption has validated but the second assumption has not been validated that professors want to know what students do and don't understand during lecture. Learnings from the experience prototyping is that we need to make the classroom experience interactive and at the same time minimize distracting factors, and that students want to have the ability to go back in time to point where they got confused in class to understand what the professor was talking about.

Conclusions

We think that the second experience prototype, anonymous ranking of questions in real time, was the most successful in achieving a desired solution of improving interactivity of classroom experience. Reasons:

- It is social, connecting students in class
- There is no distraction to use it in class
- Students liked the simpler interface than Piazza, and prioritize important questions