

## **Assignment 2: POV and Experience Prototypes**

Within the broader theme of crowd power, we chose to explore the dynamic of crowds during large lectures and talks. We want to see how we might best leverage the crowd to fix problems that come up during lecture. We've discovered that in lectures, many students are hesitant to ask questions because they fear looking foolish or "wasting" other students' time with potentially unhelpful questions. Our initial POV for this week came from one of our first interviews, which was that students don't ask questions in class even when they are lost and we should empower them to ask more questions.

We followed up by interviewing more extreme users in our space of increasing learning engagement. One of our interviews was with with Caitlin, a second grade teacher in Philadelphia. She uses pre-assessment and post-assessment before and after each unit she teaches to her class. This helps her create lesson plans and ensure that students work hard to learn the new concepts. Caitlin said that her students are never afraid of asking for help when they're confused or lost, which surprised us -- this is very unlike the behavior of college students! Interviewing more extreme users like Caitlin shed a lot of light on engagement hacks, tricks and techniques we can apply to our college-focused product ideas.



*Caitlin preparing her classroom in Philly.*

We came up with three great POVs that inspired a lot of “how might we” questions in our team brainstorming question. The POVs and a sampling of the best HMW’s are as follows:

**POV 1:** We met Jerry. We were amazed to realize that students don’t ask questions when they don’t understand. It would be game changing to empower students to ask questions.

1. *HMW* encourage students to ask other students questions instead of the professor?
2. *HMW* make it so that students don’t have to ask their questions in front of the entire class?

**POV 2:** We met Robert who needs to moderate the Q+A session at large talks because Q+A makes the event even more engaging. It would be game changing to enable him to find the best questions for the talk’s audience.

1. *HMW* ensure that diverse groups of people with diverse topics get to ask questions?
2. *HMW* get questions from the audience while the talk is ongoing so they can be answered as they come up?



The team hard at work brainstorming POV's, HMW's, and solutions!

**POV 3:** We met Felix. We were amazed to realize that they don't want to be engaged in lecture. It would be game-changing to make them want to participate in large settings the same way they participate in small groups.

1. *HMW* foster inter-student dialogue during a lecture so that students help themselves and have a friend?
2. *HMW* make the professor know what Felix needs without interrupting the class publicly?
3. *HMW* make the lecture way more interactive and force Felix to engage?

Overall, we came up with more than 47 HMW statements! We pared those down to get the top 3 HMW's and brainstormed solutions for each HMW statement. The best HMW's and a sampling of the solutions we came up with are below:

**HMW 1:** *HMW* make it so that students don't have to ask their questions in front of the entire class?

1. Ask other students who understand.
2. A way to say whether or not you understand before the professor moves on.

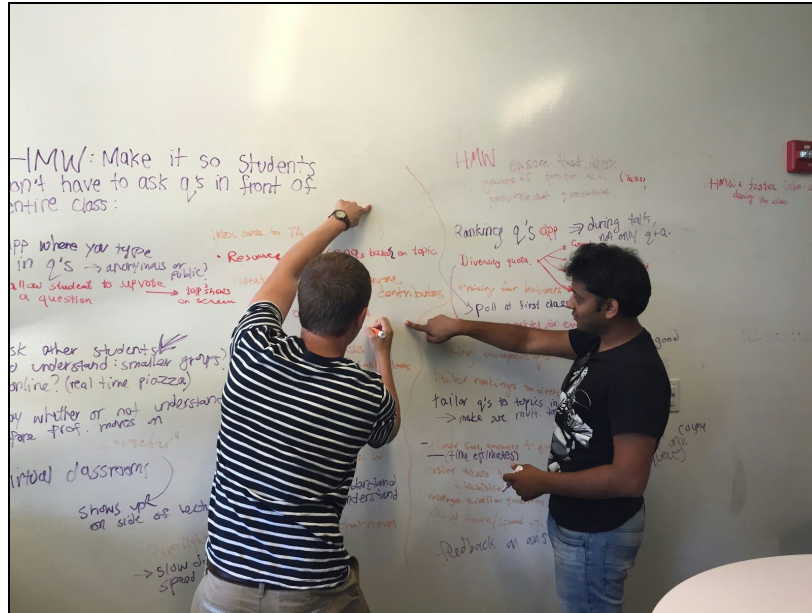
**HMW 2:** *HMW* ensure that diverse groups of people with diverse topics get to ask questions?

1. Establish a diversity quota for race, gender, age, and background when asking questions.
2. Keep a list of common questions from quarter-to-quarter and include their answers in the lecture to get more questions during Q+A.
3. The ability to ask questions anonymously.

**HMW 3** *HMW* foster inter-student dialogue during a lecture so that students help themselves and have a friend?

1. A classroom-only chatroom for use during the class.
2. Assigned, rotating seats in the lecture hall so you get to know people over the course of the quarter.

We brainstormed more than fifty solutions and then cut down, combined, and collected our thoughts into three final project ideas. They are listed below, along with how we prototyped and tested our rough ideas.



Karna and Sloane connecting ideas on the whiteboard.

### Solution 1: An app where students submit and vote on questions during the class

We prototyped an app to be used during lecture where students in the class submit and upvote questions. The professor also sees the questions and answers the most popular ones.

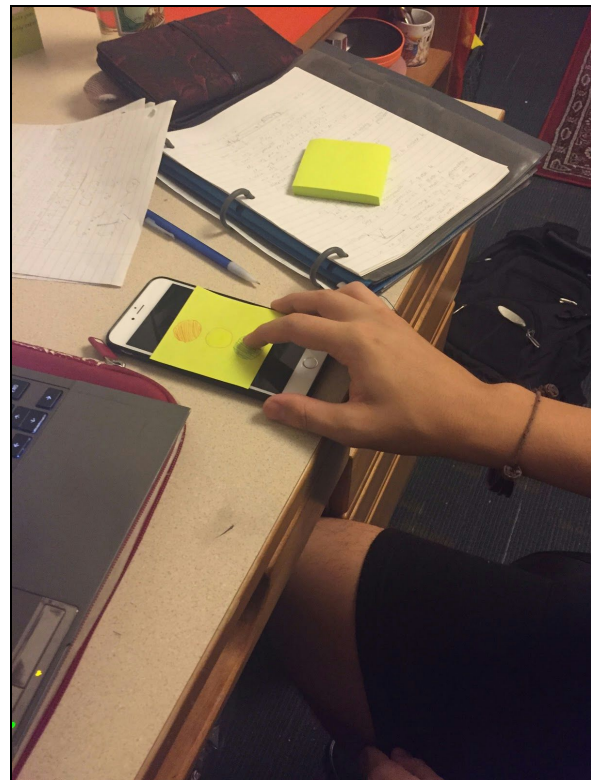
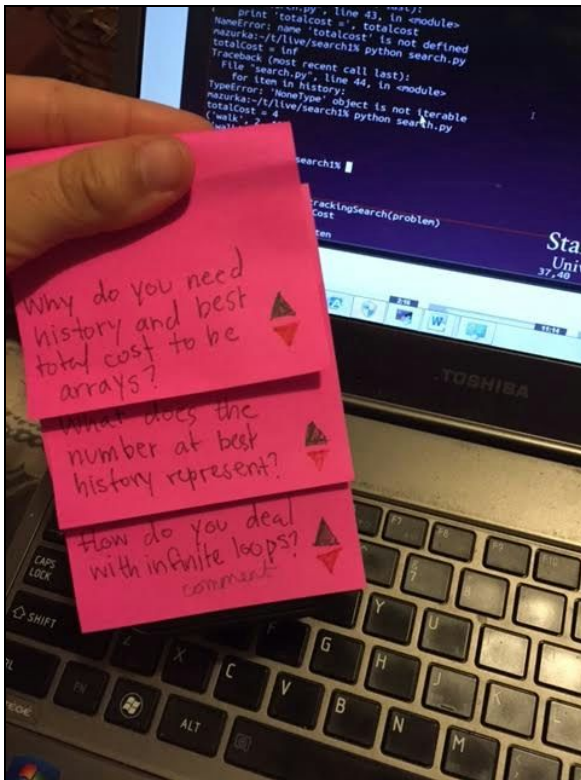
We built the prototype with sticky notes on an iPhone and used an SCPD lecture video to represent the live lecture. We slid in a sticky note with a question when the question became relevant in the lecture (We had watched the video ahead of time and knew what questions would come up.). Each sticky note has an upvote and downvote option for the student to press.

We tested it by having a student in the class, Liam, watch a portion of the lecture and upvote, downvote, or do nothing when the question showed up. Then, we showed which of the questions the lecturer actually answered in the lecture to show Liam how it compared with the questions he wanted answered. The lecture was for CS221, a class Liam is taking, but he had not seen the lecture yet.

Liam upvoted one of the questions, which the professor did not later answer. He expressed that he liked the rating system, so that harder questions would be answered. The

simple interface of up and down arrows worked well; Liam was at no point confused by the app. Liam did say, “I’d probably would upvote every question since I’m always lost.” He worried, however, that he would stop paying attention to lecture or lose track of lecture while reading the questions/typing questions.

We learned that typing/reading questions can serve as a distractor for students watching difficult lectures that they don’t understand. The assumption, however, is still valid, because Liam liked the fact that the most highly rated questions got answered. The new assumption is that we need to simplify the way questions are asked on the app. A potential future idea is having multiple topics pre-picked by the teaching staff instead of questions from students, and the students can upvote and downvote topics they are confused by.



Our two prototype iPhone apps. Solution 1 (left) and Solution 2 (right).

## **Solution 2: An app that gathers sentiment from students to indicate how fast lecturers should go through class**

For another prototype we imagined an app that allows students to ask the teacher to speed up or slow down the lecture based on feedback. We used a sticky note on an iPhone with a stoplight drawn on it to represent the app. We represented lecture with an online video of CS221. We tested with Michael, a student in the class, who had yet to see the lecture.

We did not explain the app extensively to Michael: he assumed correctly that red was to slow down, yellow was to stay the same, and green was to speed up. As Michael pressed the buttons, we changed the speed of the lecture using the fast forward and slow down options on the video to simulate a teacher changing the speed at which they are teaching the material.

Once Michael started using the app, he pressed green first, then waited a couple seconds, and pressed green again. However, only a few seconds later, he became very lost and started dramatically poking the red over and over. Michael never pressed the yellow. At the end of the session, we asked what he understood from lecture. He replied, "I was too interested in the app, I'm probably going to need to rewatch it."

We learned that the app might be distracting to students, and that they may miss out on content by using it. However, this also means Michael found the app useful: he wanted to change the speed of lecture, he just went too far in one direction. Our new assumption is that we need to put some kind of limit on the app. Potential future ideas are to only allow it to be used at certain times in lecture.

## **Solution 3: Resource management system that all students build collaborative class notes**

For our third prototype, we created a rough sketch of what using our RMS product on your laptop in lecture would be like. The idea is that students and TA's would build a database of links, articles, and text about a course and share it with the rest of the class. Our prototype

consisted of pieces of paper on a laptop screen and having one of our team members “teach” a new skill to the student. We had our student, Masira, interact with the fake webpage every time she felt lost.

On the whole, using our prototype was a simple experience for Masira. She was able to identify the search bar and type the topic to search and found that the related topics on the sides were interesting to her. There are considerable downsides to using such a product in class, though. For example, whenever she tried to do slow interactions or in-depth readings, she felt distracted from the class and disengaged from the lecturer. We learned that it is very distracting to have to go through a lot of text while professor is teaching. She expressed the concern that she wants relevant topics in class to be summarized in either pictorial form or small definitions or formulas.

Our assumption that having a large corpus of class notes would help the lecture experience was solidly debunked. It is more distracting than helpful. During class time the student wants a quick review of the topic and doesn't want to understand through reading pages of deep text.



Left: Masira and the prototype. Right: Karna as professor.

None of our prototypes worked exactly how we expected. Overall, we found that the Q+A app tested the best and had the most positive impact in the classroom. All of our products were too distracting from the lecture to be encouraged and appreciated by the teaching staff, so we need to find a way to incorporate either the class-speed-meter or Q+A app into a more streamlined, easy to use application.