

click Education
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Project 2 - CS 147

Problem domain

Our studio's theme is Learning. Beginning with a focus on K-12, we then zoned in on High School. We've narrowed even further to: ***improving student-teacher interactions in high school.***

Initial POV

We met: Students who, as one teacher we interviewed said, "played school well"

We were amazed to find that: The great majority, even of exceptional students, weren't engaged beyond the minimum required for a good grade. Even smart students saw education and fun as mutually exclusive.

It would be game-changing to: Create a system where students are engaged more than the minimum amount required.

Some significant thoughts from our interviews with our students and teachers:

When we asked one of the students, "what was your favorite experience that combined educational and interesting content?", he responded "I think a project is either educational or interesting", specifically saying he thought academics and fun were mutually exclusive.

From the teachers' perspective, Mrs. Quattrocchi and Mr. Wong mentioned that one of the largest challenges was holding students' attention. Even among their best students, few kids were interested in learning beyond getting a good grade or satisfying their parents' expectations.

Additional Needfinding Results

We did four additional needfinding interviews to try to further refine this POV. We interviewed Luke, Elizabeth, Ms. Giraudo, and Mr. Downs, see appendix for MUCH more detail. The novel points were:



Luke loved one-stop scheduling (no syllabi) and never gave feedback because he shouldn't critique teachers.

Ms. Giraudo explained she liked easiness of revising lessons and grading was huge time sink.

Mr. Downs thought Pads caused isolation and wanted tech to monitor student tech usage.

Elizabeth liked strange assignments, e.g. duct tape fashion show, vigorously disliked teachers not making efforts to avoid testing conflicts, and thought tech use was only distracting at home.



In addition to these points, our important previous points were confirmed: that students needed grades for motivation not interest, that fun and academics were mutually exclusive, and that it was hard to tell when students were engaged. However, Mr. Downs and others thought our POV was too broad and intractable.

Revised POV's

We revised our initial POV's to dive deeper into what we were amazed to find. Our first revised POV was:

We met: Mrs. Woodward, a teacher who constantly updated her lectures to make them more relevant and engaging.

We were amazed to find that: Mrs. Woodward considered student attention important enough to explicitly ignore teaching for the first several minutes, but couldn't tell whether her attempts were effective.

It would be game-changing to: give teachers immediate feedback about how engaging they were being.

Mrs. Woodward kept second-guessing herself after every attempt to engage students with non-educational material, changing her material from class to class *in a single day*.

Our second revised POV was:

We met: Elizabeth, a student who complained about having multiple large tests/assignments on the same day

We were amazed to find that: even though a tool exists for collaborative scheduling, teachers find that using this tool is too much effort considering all they're already responsible for

It would be game-changing to: offload the task of collaborative scheduling to the students, who have the most incentive

The main problem seemed to be a misalignment of incentives: it was the *teachers* who would have put in the extra effort to schedule around each other, but it was the *students* who would benefit from a more balanced schedule.

Sample of 10-15 HMW's

We used Professor Landay's helper-prompts to spur on the creation of our "How Might We...s"

"Explore the opposite": "HMW have teachers focus their attention on making their lectures more educational, and forget about having to make it engaging?"

"Create an analogy from need or context": "HMW help teachers plan their classes like a movie/play?"

"Identify unexpected resources": "HMW get parents involved in the process of scheduling large assignments?"

We didn't solely rely on the Landay's helper-prompts, though. For instance we thought of:

“HMW draw the students’ attention to the days when they *don’t* have that many assignments?”

Best HMW’s

Two of our three best HMW’s stemmed from Mrs. Woodward’s POV about sacrificing class-time to engage students (see above in “Revised POV” section for full text). They were:

1. HMW we give the teacher positive feedback instead of negative feedback on how well they are lecturing, or turn negative feedback into positive feedback?

2. HMW have the *students* be the ones who are making the class engaging?

The other HMW stemmed from Elizabeth’s POV about struggling when teachers would schedule large assignments for the same day (see above in “Revised POV” section for full text). It was:

3. HMW give students a voice in scheduling exams and large assignments?

Experiential Prototype 1

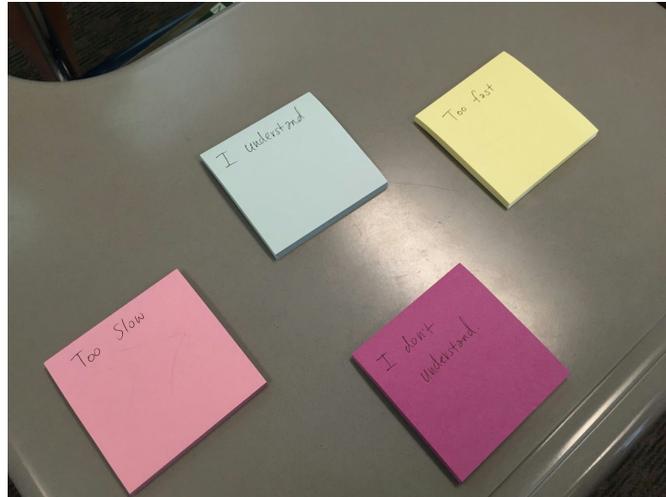
Our first experiential prototype modeled instant feedback from student to teacher.

Our assumptions:

Our assumption was that teachers wanted real-time feedback on how their lecture was going.

Making the Prototype:

We wanted to simulate the experience of instantly telling the teacher that you don’t understand, or that the lecture is going too slow. We created different colored sticky notes with four possible messages on them, and would place the stickies in front of the teacher as she lectured.



Testing the Prototype:

To test this, we set the scene in a classroom and asked our participant to teach a short lesson. During the lesson, we acted as the student and used four different colored post-its to signal, “I Understand,” “I Don’t Understand,” “Too slow,” and “The fast.”



Results:

Worked: The scenario gave the teacher an accurate representation of what it would be like to receive feedback in real time

Didn't Work: The teacher found the feedback during the lecture to be distracting. Because it was one teacher to one student, we were not able to simulate demand from multiple students.

Surprised: Ms. Giraudo said that even if 10% of the class were not understanding, she wouldn't stop because she had to think about the 90% that did understand.

Learned: After the mock lecture with Ms. Giraudo, we learned that the regular messages from the students proved distracting to her, and that it was difficult to constantly change the pace of the lecture. Her confidence was visibly diminished by the "I Don't Understand" and "Too Slow" cues.

Valid Assumptions:

Indeed the teachers wanted to know what the students thought of the lecture, but only *after* the fact. Getting feedback during lecture was too jarring for them. We surfaced two new assumptions that we want to test:

1. Will teachers actually use the feedback after class?
2. Will the app be too distracting for students and teachers?

Experiential Prototype 2:

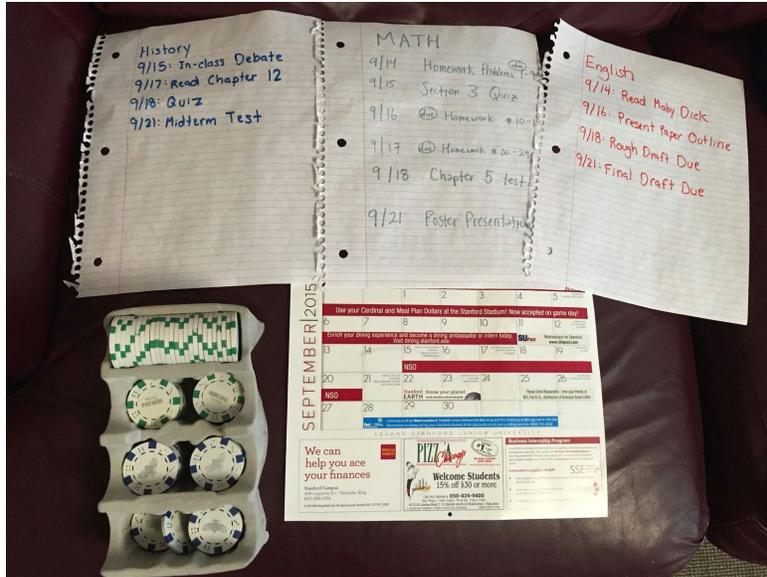
Our second prototype modeled an academic heatmap of the amount of work each day required.

Our assumptions:

Based on our additional interviews, we went in with the assumption that students would like to avoid having multiple big assignments or exams on the same day.

Making the Prototype:

We asked students to take three syllabi and map out a week's worth of work. They stacked varying numbers of poker chips on a calendar depending on the type of assignment to visualize the amount of work they had.



Testing the Prototype:

The two students we tested, Casey and Zack, both stated that it was helpful to see the physical representation of the work that they had. Casey said that he only wrote down his homework on a daily basis, so he never got to see the big picture.



Results:

What worked: The 3D stacks did a great job of making the visual impact we wanted.

What didn't work: Students thought that there needed to be more variability in point values for different assignments.

Surprised: We were surprised that students felt uncomfortable asking for an extension even when they had good cause

Learned: Students did not plan more than one day ahead

Valid Assumptions:

We confirmed that the physical representation of work made the students more aware of when large scheduling conflicts would occur. We surfaced a new assumption from our follow-up with the students that they would be willing to put in the work themselves to fill this out to avoid scheduling conflicts.

Experiential Prototype 3

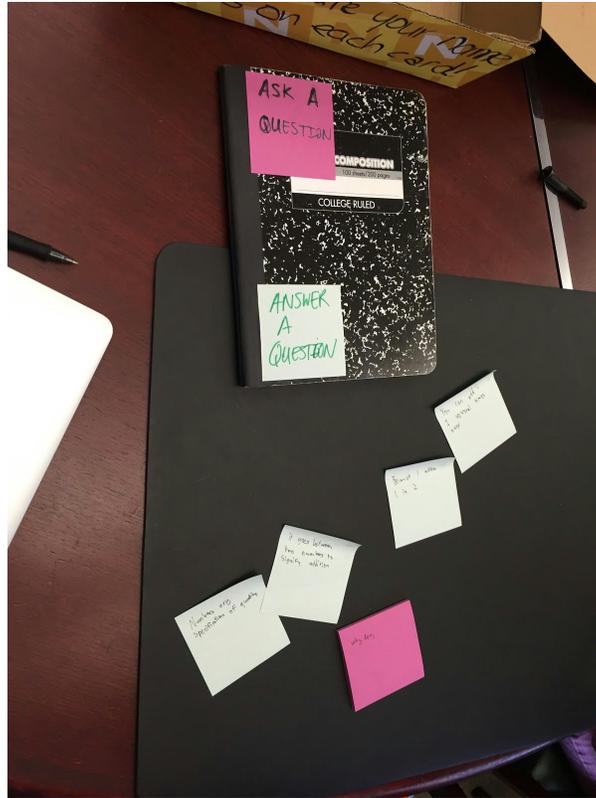
Our final prototype modeled one on one conversation between students who understood the material and those who didn't.

Our assumptions:

Students need a better way to ask each other for help in class.

Making the Prototype:

We played the role of teacher and set the scene of a classroom - and we asked Michael to be a student who was understanding the material and Cegil to be a struggling student. They were given post its to "pass notes" to one another during the lecture, with Cegil asking questions and Michael answering them. We also selected ping pong balls from a fishbowl (like during Bingo) to "randomize" the pairing process.



Results:

What Worked: The students were able to communicate via post-its without distracting the third student.

What Didn't: It was clear that the two engaged in conversation were not fully paying attention. Cegil also mentioned that he imagined he would have difficulty wording the questions if he were really confused.

Surprised: We had assumed that anonymous chatting would be best, but they wanted the responder's name to be visible so they could receive recognition.

Learned: The test ran smoothly, but Cegil told us that he got distracted while learning and only fell further behind. Michael told us that he was comfortable responding to the questions and following the lecture simultaneously.



Valid Assumptions:

Our assumption was faulty, and we suspect that any form of distraction would hurt a struggling student's understanding.

Conclusion:

Our most successful prototype was our first one because Ms. Giraudo's comments challenged our initial assumptions while indicating the significant potential impact. We learned that a flurry of feedback is distracting, and that the teacher would not stop if only a few students didn't understand. Now we believe the teacher only wants to be notified if a significant portion of the class is feeling the same way. We will think about a report that would give a teacher concise insight at the end of a lecture. The next step would be to test students in the same scenario, and figure out what motivates their participation.