sameQ

Questions paired, knowledge shared.

CS 147 – Autumn 2023

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INTRODUCTION

One-liner

Questions paired, knowledge shared.

Value Proposition

Elevate office hours: match questions, connect students, and share knowledge.

Mission Statement

Empower educators and students alike with SameQ, unlocking the potential of collaborative learning and efficient office hours. By eliminating question redundancy and facilitating peer collaboration, SameQ helps to foster a vibrant learning community and enhance academic success.

Problem and Solution Overview

In the realm of education, prolonged wait times during office hours have become a prevalent issue, causing frustration for students and inefficiencies for instructors who grapple with lengthy queues and repetitive queries.

Enter Same Q—a revolutionary office hours tool designed to seamlessly connect students with similar questions. By fostering peer collaboration through group interactions, including chat and voice chat functionalities, our tool not only minimizes wait times but also transforms office hours into dynamic hubs of shared knowledge. Moreover, educators benefit from enhanced productivity as question redundancy is effectively eliminated, allowing for a more streamlined and meaningful engagement with students.

NEEDFINDING

Interviews

In the early stages of our design process, we established that our goal was to address challenges within mainstream education with technology. This led us to initially direct our attention toward creating a solution tailored for instructors.

During the initial phases, we purposefully selected a diverse group of six instructors to ensure a representative sample for valuable feedback. Our interviews covered a spectrum of ages, subjects taught, and teaching locations. To accommodate geographical diversity, two interviews were conducted via Zoom, connecting with instructors in different states and countries. The remaining four interviews took place in person at locations chosen by the interviewees. While participants did not receive compensation, we made a concerted effort to express our gratitude and appreciation for their time and insights.

We asked each instructor questions from a universal question bank. We then asked additional questions tailored to each instructor's background and experiences. Below are some of the questions from the universal question bank.

1. How do you develop your curriculum?
2. Can you share an experience where technology helped you overcome a teaching challenge? where it hindered your teaching efforts?
3. How do you get feedback to students? What are the most gratifying and frustrating parts of the process?

While these questions were broad, they allowed us to engage in a wide range of discussions addressing varying aspects of teaching. The following are insightful quotes from some of the instructors.

> *"[My favorite part about teaching is] being able to see people's expression when they finally get something." – D, a teacher in the Bay Area*

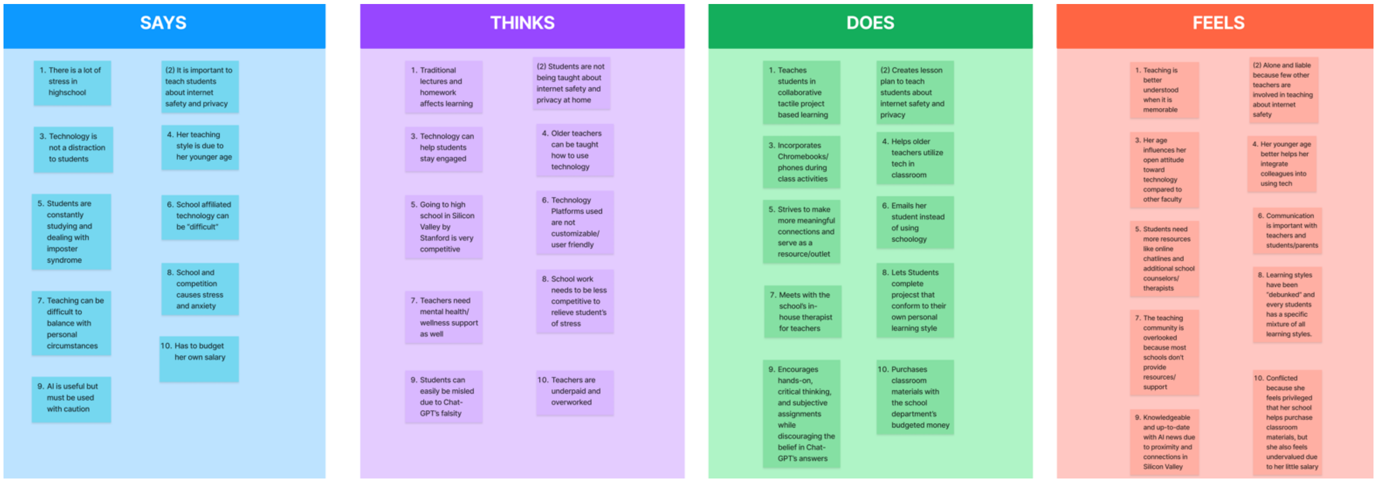
> *"I do not grade math assignments for accuracy…it's a lot. It's like 12 pages of work per person per week." – T, a teacher at a special-curriculum school in Washington*

> *"At the end of the day, it's the teacher that gives input to the kids, and the kids give output back." – J, an English teacher in Japan*

Synthesis

Instructors enter the teaching profession with excitement and passion for facilitating student learning. The interviews underscored the need for tailored solutions that respect the individuality of instructors and their teaching experiences.

Below are some of the empathy maps we created using the information gathered from the respective interviewees.



SAYS

1. There is a lot of stress in highschool

(2) It is important to teach students about internet safety and privacy

3. Technology is not a distraction to students

4. Her teaching style is due to her younger age

5. Students are constantly studying and dealing with imposter syndrome

6. School affiliated technology can be "difficult"

7. Teaching can be difficult to balance with personal circumstances

8. School and competition causes stress and anxiety

9. AI is useful but must be used with caution

10. Has to budget her own salary

THINKS

1. Traditional lectures and homework affects learning

(2) Students are not being taught about internet safety and privacy at home

3. Technology can help students stay engaged

4. Older teachers can be taught how to use technology

5. Going to high school in Silicon Valley by Stanford is very competitive

6. Technology Platforms used are not customizable/ user friendly

7. Teachers need mental health/ wellness support as well

8. School work needs to be less competitive to relieve student's of stress

9. Students can easily be misled due to Chat-GPT's falsity

10. Teachers are underpaid and overworked

DOES

1. Teaches students in collaborative tactile project based learning

(2) Creates lesson plan to teach students about internet safety and privacy

3. Incorporates Chromebooks/ phones during class activities

4. Helps older teachers utilize tech in classroom

5. Strives to make more meaningful connections and serve as a resource/outlet

6. Emails her student instead of using schoology

7. Meets with the school's in-house therapist for teachers

8. Lets Students complete projecst that conform to their own personal learning style

9. Encourages hands-on, critical thinking, and subjective assignments while discouraging the belief in Chat-GPT's answers

10. Purchases classroom materials with the school department's budgeted money

FEELS

1. Teaching is better understood when it is memorable

(2) Alone and liable because few other teachers are involved in teaching about internet safety

3. Her age influences her open attitude toward technology compared to other faculty

4. Her younger age better helps her integrate colleagues into using tech

5. Students need more resources like online chatlines and additional school counselors/ therapists

6. Communication is important with teachers and students/parents

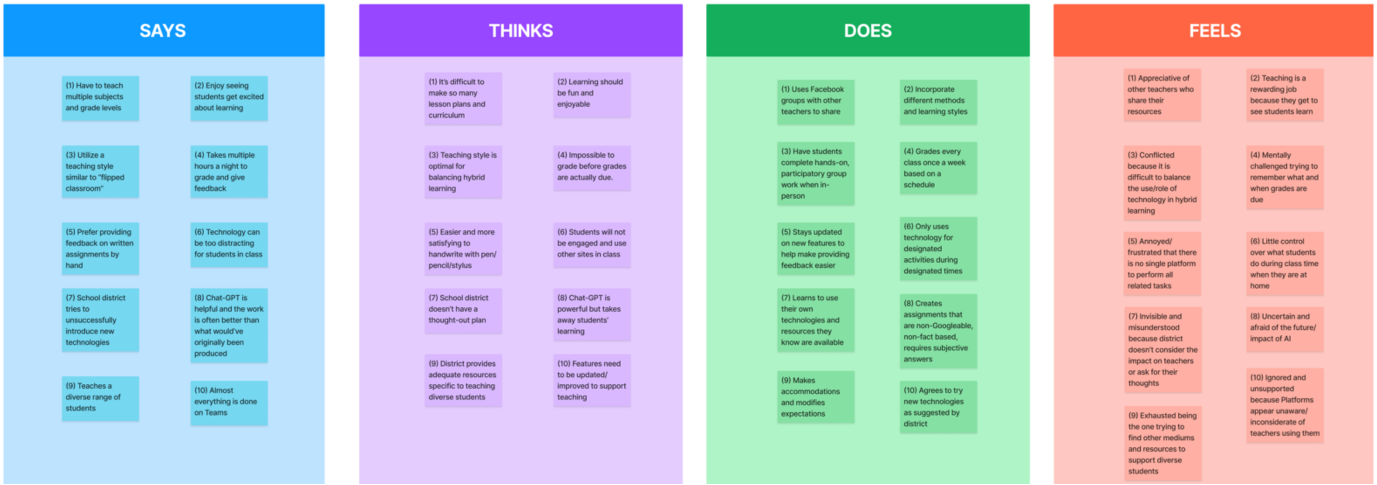
7. The teaching community is overlooked because most schools don't provide resources/ support

8. Learning styles have been "debunked" and every students has a specific mixture of all learning styles.

9. Knowledgeable and up-to-date with AI news due to proximity and connections in Silicon Valley

10. Conflicted because she feels privileged that her school helps purchase classroom materials, but she also feels undervalued due to her little salary

Figure 1: Empathy map for D



SAYS

(1) Have to teach multiple subjects and grade levels

(2) Enjoy seeing students get excited about learning

(3) Utilize a teaching style similar to "flipped classroom"

(4) Takes multiple hours a night to grade and give feedback

(5) Prefer providing feedback on written assignments by hand

(6) Technology can be too distracting for students in class

(7) School district tries to unsuccessfully introduce new technologies

(8) Chat-GPT is helpful and the work is often better than what would've originally been produced

(9) Teaches a diverse range of students

(10) Almost everything is done on Teams

THINKS

(1) It's difficult to make so many lesson plans and curriculum

(2) Learning should be fun and enjoyable

(3) Teaching style is optimal for balancing hybrid learning

(4) Impossible to grade before grades are actually due.

(5) Easier and more satisfying to handwrite with pen/ pencil/stylus

(6) Students will not be engaged and use other sites in class

(7) School district doesn't have a thought-out plan

(8) Chat-GPT is powerful but takes away students' learning

(9) District provides adequate resources specific to teaching diverse students

(10) Features need to be updated/ improved to support teaching

DOES

(1) Uses Facebook groups with other teachers to share

(2) Incorporate different methods and learning styles

(3) Have students complete hands-on, participatory group work when in-person

(4) Grades every class once a week based on a schedule

(5) Stays updated on new features to help make providing feedback easier

(6) Only uses technology for designated activities during designated times

(7) Learns to use their own technologies and resources they know are available

(8) Creates assignments that are non-Googleable, non-fact based, requires subjective answers

(9) Makes accommodations and modifies expectations

(10) Agrees to try new technologies as suggested by district

FEELS

(1) Appreciative of other teachers who share their resources

(2) Teaching is a rewarding job because they get to see students learn

(3) Conflicted because it is difficult to balance the use/role of technology in hybrid learning

(4) Mentally challenged trying to remember what and when grades are due

(5) Annoyed/ frustrated that there is no single platform to perform all related tasks

(6) Little control over what students do during class time when they are at home

(7) Invisible and misunderstood because district doesn't consider the impact on teachers or ask for their thoughts

(8) Uncertain and afraid of the future/ impact of AI

(9) Exhausted being the one trying to find other mediums and resources to support diverse students

(10) Ignored and unsupported because Platforms appear unaware/ inconsiderate of teachers using them

Figure 2: Empathy map for T

Though each teacher had unique concerns to share, most of our discussions tended to center around technology and its role in the classroom. Many instructors had predominant concerns about the integration of technology and how products can be thoughtfully designed to cater to not only the unique needs of instructors, but their students as well. Despite the increasing reliance on technology in many parts of the world, our findings suggest a critical gap, with existing technological resources often falling short in adequately supporting educators in crucial aspects of their role by taking up more time to use than they save, or presenting a distraction to students.

Other themes from our interviews included unsustainable levels of time spent on grading, a lack of time available to meet individually with students, an enormously divergent level of concern around the use of ChatGPT by students, satisfaction with existing technological tools available to finding and developing curriculum, and dissatisfaction with existing technological tools for in-classroom use.

POVs AND EXPERIENCE PROTOTYPES

POVs and HMWs

With the concerns and needs of the instructors in mind, we chose our three most insightful interviews to develop Point of Views (POVs). We then developed How Might We's (HMWs) to further understand the problems and begin brainstorming solutions.

Note: For the following sections, each POV corresponds with the respective solution and experience prototype, labeled with a number.

POVs	HMW...
1. **We met...** C, a social sciences teacher who works at a well-funded private school in the Bay Area and loves incorporating technology into the classroom. **We were surprised...** to hear she must grade 108 papers in two weeks. **We wonder...** if this means she is worried that she is providing surface-level feedback unable to nurture her students' growth. **It would be game-changing...** if C had a streamlined and	• **direct the instructor's attention to the assignments that need the most help?** • eliminate grading? • automate grading with simple benchmarks? • outsource grading?

efficient grading solution that did not interfere with her other responsibilities.	
2. **We met…** T, a high school teacher at a parent partnership homeschooling program who must assign lots of asynchronous work, since she only sees her students once a week. **We were surprised…** to hear it is impossible to prove when students are using ChatGPT. **We wonder…** if this means that instructors are forced to change the types of assignments they give in order to prevent academic dishonesty and students using AI. **It would be game-changing…**for instructors to not have to worry about students using AI on their assignments.	● ***allow students to document their writing process and progress throughout an assignment?*** ● eliminate access to AI? ● encourage students to use AI sparingly and intentionally, if at all?

3. **We met…** P, a high school science teacher at a well-funded private school in the Bay Area. **We were surprised…** to hear students wait in his room for hours after school to meet with him. **We wonder…** if this means students do not know when they will be able to meet with their instructor, and if this requires being in-person every time. **It would be game-changing…** for students to not have to worry about missing their opportunity while making use of the time they spend waiting to meet with the instructor.	• **make the wait just as much of an opportunity to learn as the time spent with the instructor themself?** • make scheduling more transparent? • make waiting fun? • encourage

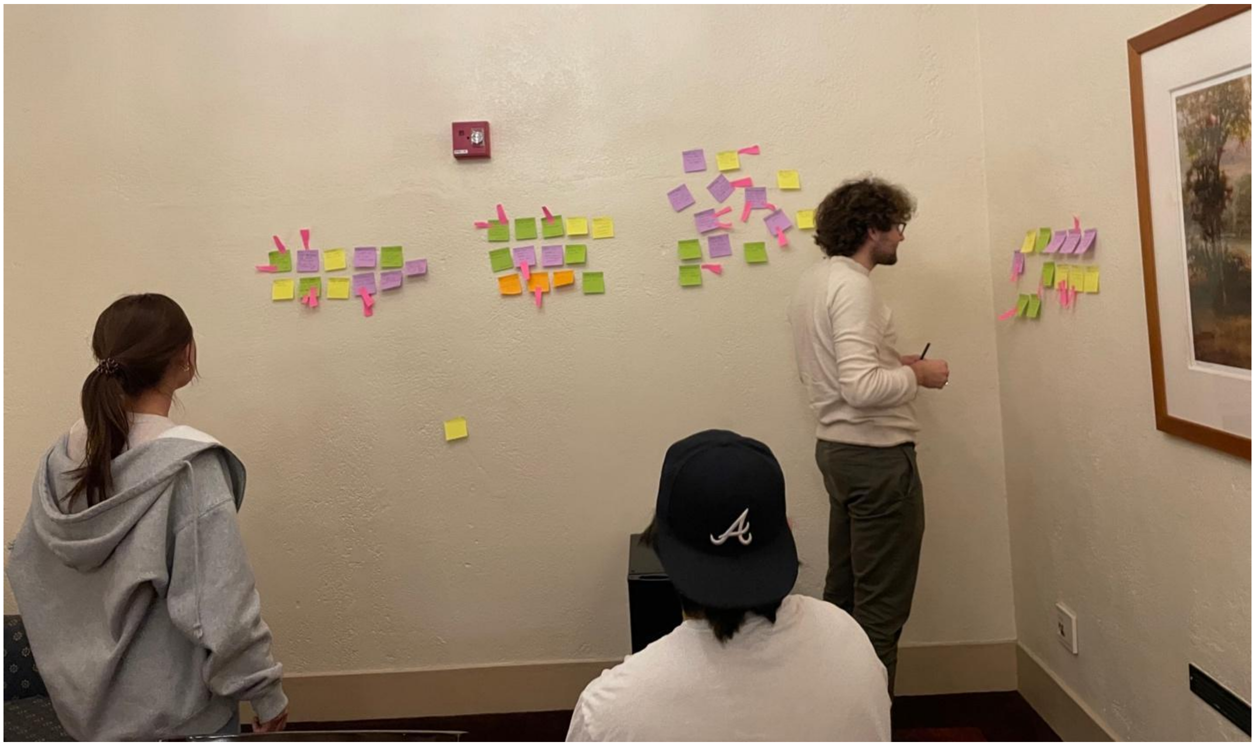


Figure 3: Our team developing HMWs

Top Solutions

Based on the insights gathered through the needfinding process, we came to realize that it would be in our best interests to create a solution that both instructors and students could benefit from. Since many instructors discussed their students and how their students are also impacted by the inadequate technology currently available, we expanded our target user group to include students, while keeping a focus on the pain points teachers identified. With this in mind, we developed three solutions that we believed could best alleviate a common pain point between instructors and their students.

1. A tool that encourages peer grading and ranks the quality of peer grading, so teachers can rely on students to provide peer feedback.
2. A system for an iterative writing process that tracks changes and prompts the student to complete the writing in steps.
3. A tool that groups students with the same question, so they can see the instructor at the same time and are connected to others with similar concerns.

Experience Prototypes

For each top solution, we created an experience prototype to test our underlying assumptions and learn more about the problem space.

Experience Prototype 1 – Peer Grading

We gathered a set of writing sample peers at Stanford. To ensure the samples were comparable and our test subjects were familiar with the requirements of the assignment, they were all PWR1 RBA introductions. We then presented the samples to other peers, and we asked if they could identify the samples that needed the most help or feedback from the instructor. Likewise, we asked them to identify the samples with the highest quality work that would need minimal feedback or attention.

Assumption: Students can reliably identify which assignments of their peers' may need the most help.

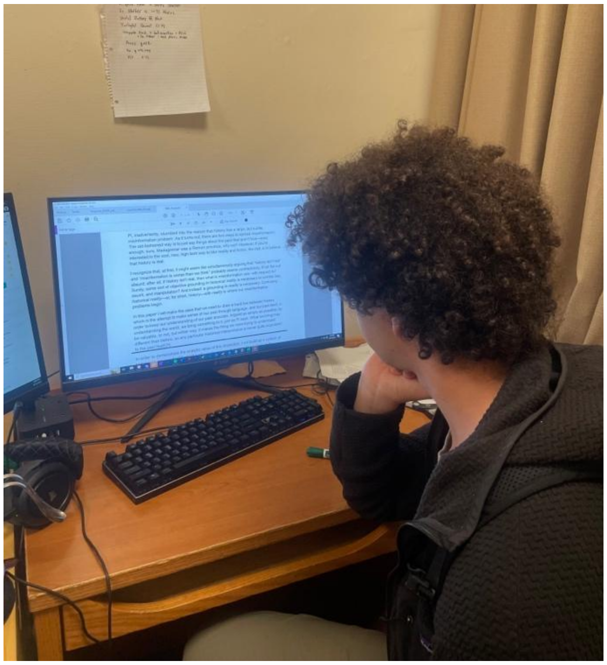


Figure 4: A student completing Experience Prototype 1

What worked	What didn’t work
• Using samples from courses that participants are familiar with • Providing the prompt related to each sample • A strong consensus emerged about which writing samples needed the most and least help.	• Using samples of different writing styles that made it difficult to compare and rank samples • Limiting it to essay feedback

Experience Prototype 2 – Iterative Writing Process

We gathered two peers and asked them to complete two poem analyses. During the first poem analysis, they were allowed to write using any process they desired. Both peers opted to write in a freeform process. During the second poem analysis, they were prompted to write using an iterative process as follows: Write a thesis, write the supporting details, revise.

Assumption: It is more helpful than burdensome to force students to use a formal writing process.

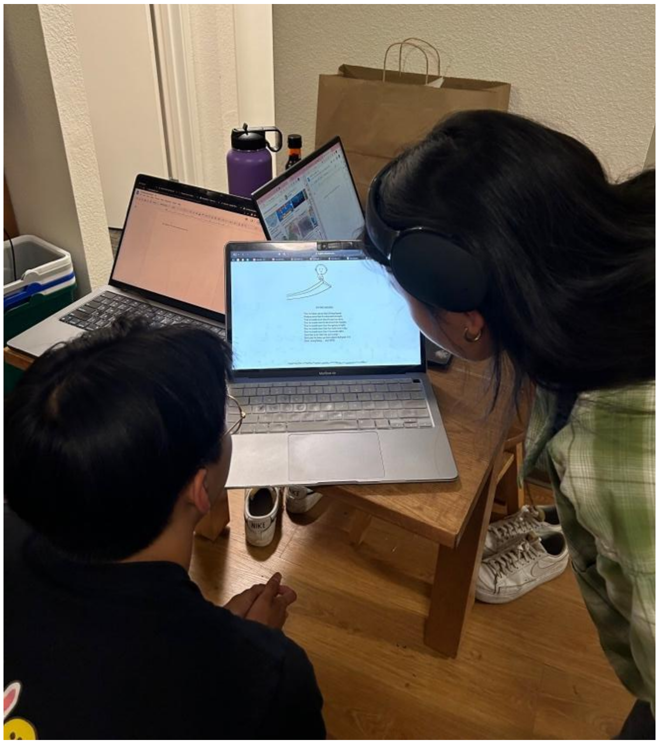


Figure 5: Two students completing Experience Prototype 1

What worked	What didn’t work
• Letting the participants reference the poem before and throughout both writing processes • Picking poems with images • Using poems familiar to participants • Participants felt that being forced to use the process made it easier to write, and especially assisted in getting started.	• Having a time limit that put pressure on participants • Not allowing participants to revise until the very end of the writing process during the second analysis

Experience Prototype 3 – Office Hours Survey

We attended an office hours session for a popular course and surveyed the students there. We asked the students about the question they were working on and waiting to be helped with, how long they had been waiting for, and if they had collaborated with any other students while at the office hour session.

Assumption: Many students with the same question show up at different times and/or spend a lot of time waiting to be helped.

What worked	What didn’t work
• Attending a highly populated course office hours session • Students often had questions in common and had been waiting for some time.	• Only attending one type of course subject’s office hours • Some conversations felt rushed so students could get back to their work • Only conducting this test at an elite university likely biased our results.

Design Evolution

Final Solution

Given the results from experience prototype testing, it was tough to decide what to focus on. We had promising results for all three solutions, with our assumptions largely to fully validated.

Yet, in the end, we decided to build an app for enabling collaboration between students, no matter their location – before and during office hours.

Why did we choose this path forward? We evaluated the areas through two lenses. **First, we analyzed the problem area,** like this:

population (that experiences pain point) x
frequency (they experience the pain) x
magnitude (of pain experienced)

We came to the conclusion that by building a product that can address high-schoolers, university students, and students in professional schools, we target a huge population, much larger than the population targeted at just the high-school segment; it would not have felt feasible to “force” college students to do all their writing within a controlled anti-GPT app, for example.

Then, we asked ourselves the following about the solution: is it already solved? Are we well-equipped to solve it – especially in a 10-week UI design class? And are we excited to solve it?

That’s where the final decision was made. For collaborative grading, there exist multiple tools already. For the writing process solution, while similar tools exist (including Chrome extensions that track changes in Google Sheets), the key datapoint was that much of this solution would be back-end or algorithm-driven, and as such not quite appropriate for a UI-focused class.

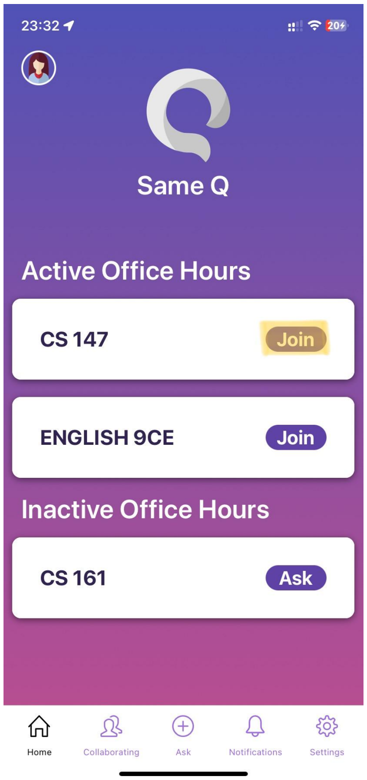
Most importantly, we were most excited about building Same Q. The prospect of building a surveillance tool to help people learn to write without GPT just didn’t feel as exciting, so we chose Same Q.

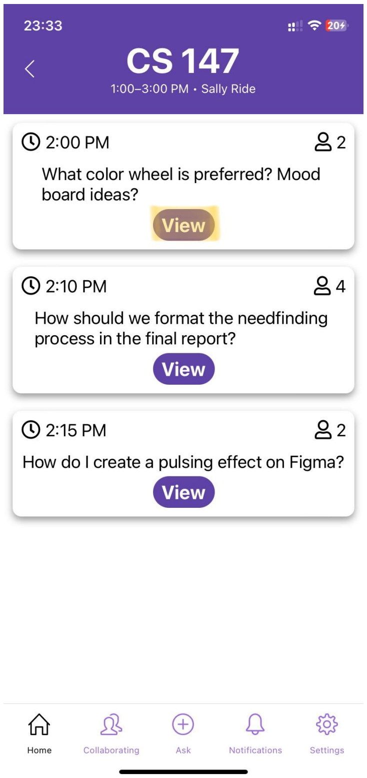
Tasks

Since Same Q is focused on collaboration, not just office hours, the tasks we defined and implemented were:

1) Simple: Join a question asked by a classmate

This is important because it is the first step of collaboration. While it allows for managing office hours effectively and efficiently, it is important we make it easy to find questions that fellow students asked. We therefore tweaked our home screen to invite people to first join the class and look at existing questions, and – even if they ask their own – to then be taken to a page that shows similar questions.

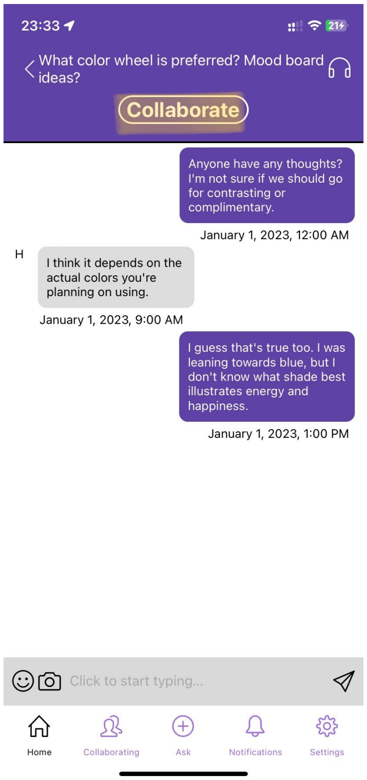




2:00 PM 2
What color wheel is preferred? Mood board ideas?

2:10 PM 4
How should we format the needfinding process in the final report?

2:15 PM 2
How do I create a pulsing effect on Figma?



What color wheel is preferred? Mood board ideas?

Anyone have any thoughts? I'm not sure if we should go for contrasting or complimentary.

January 1, 2023, 12:00 AM

H

I think it depends on the actual colors you're planning on using.

January 1, 2023, 9:00 AM

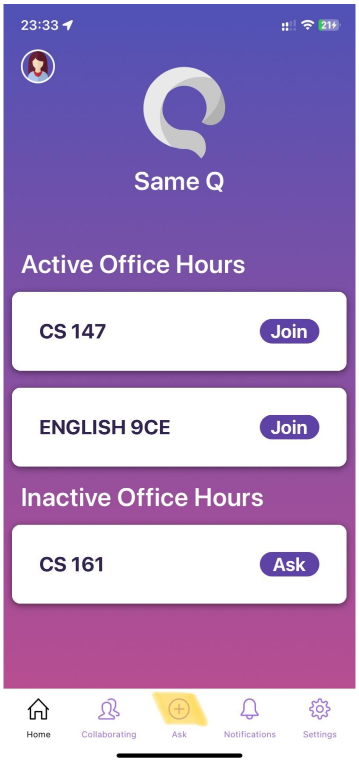
I guess that's true too. I was leaning towards blue, but I don't know what shade best illustrates energy and happiness.

January 1, 2023, 1:00 PM

2) Moderate: Create a question and join its huddle

Not every question will already have been asked by another student, and a key goal of Same Q is to free up instructor time for the questions that are truly unique and need personal attention. As such, this is the most important task, which will happen frequently, but not quite as frequently as simply opening the app and checking other questions and the wait for office hours. Since it is crucial for enabling collaboration and connecting students to help, we put the ask feature at the center of the app (and the bottom bar).

Then, as a next step, after asking the question, people are given the option to go straight to the question, where it's easy to join the huddle, using an icon similar to what is used in Slack/discord, so that it should be self explanatory.



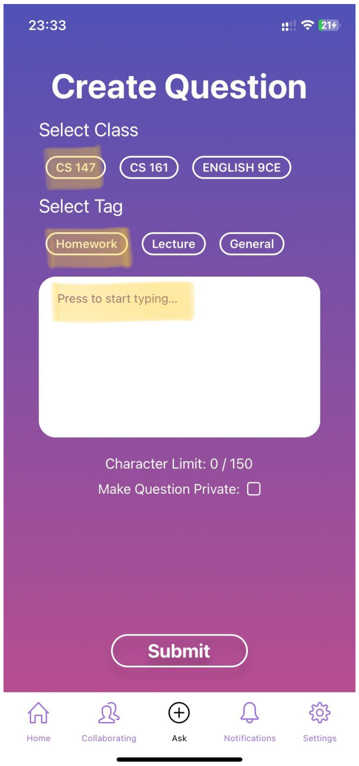
Active Office Hours

CS 147 Join

ENGLISH 9CE Join

Inactive Office Hours

CS 161 Ask



Create Question

Select Class

CS 147 CS 161 ENGLISH 9CE

Select Tag

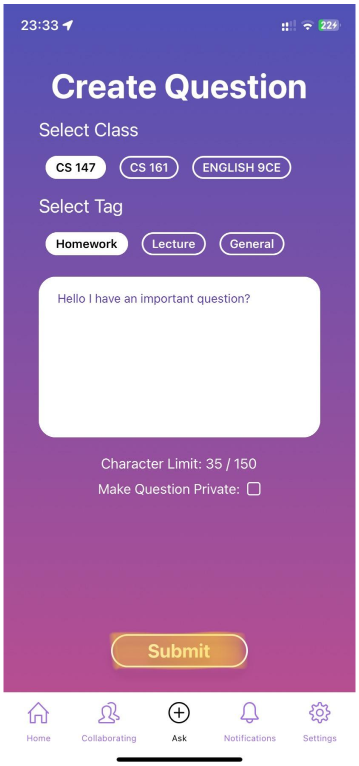
Homework Lecture General

Press to start typing...

Character Limit: 0 / 150

Make Question Private: □

Submit



Create Question

Select Class

CS 147 CS 161 ENGLISH 9CE

Select Tag

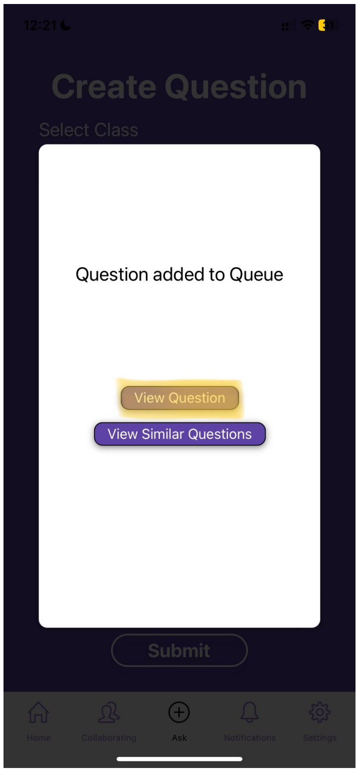
Homework Lecture General

Hello I have an important question?

Character Limit: 35 / 150

Make Question Private: □

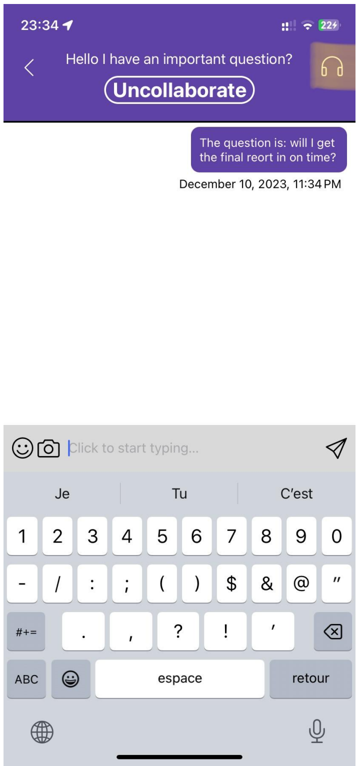
Submit



Question added to Queue

View Question

View Similar Questions



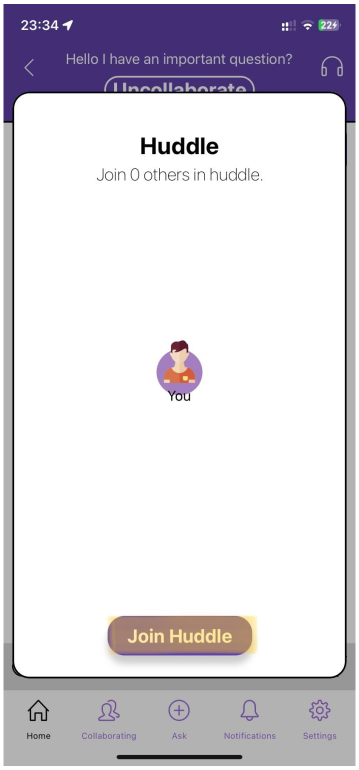
Hello I have an important question?

Uncollaborate

The question is: will I get the final reort in on time?

December 10, 2023, 11:34 PM

Click to start typing...



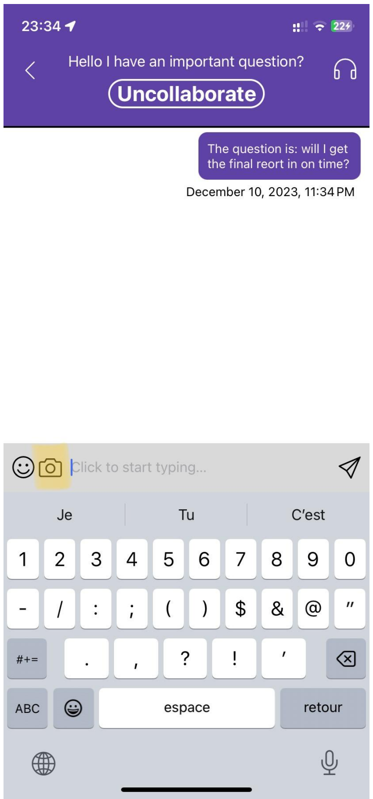
Huddle

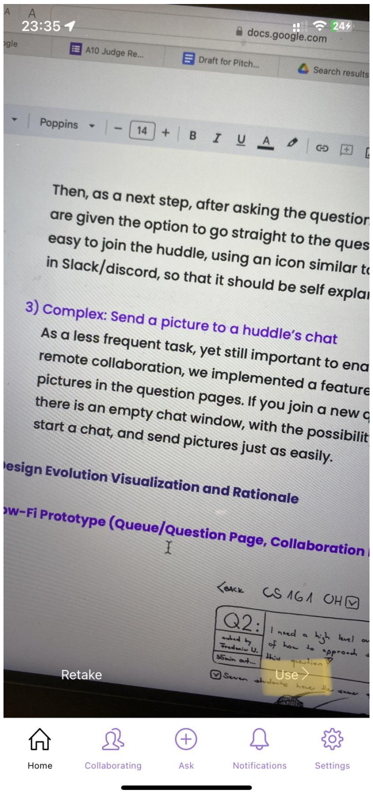
Join 0 others in huddle.

Join Huddle

3) Complex: Send a picture to a huddle's chat

As a less frequent task, yet still important to enable fruitful remote collaboration, we implemented a feature to share pictures in the question pages. If you join a new question, there is an empty chat window, with the possibility to easily start a chat, and send pictures just as easily.


23:34
Hello I have an important question?
Uncollaborate
The question is: will I get the final reort in on time?
December 10, 2023, 11:34 PM
Click to start typing...


23:35
docs.google.com
Then, as a next step, after asking the question
are given the option to go straight to the ques
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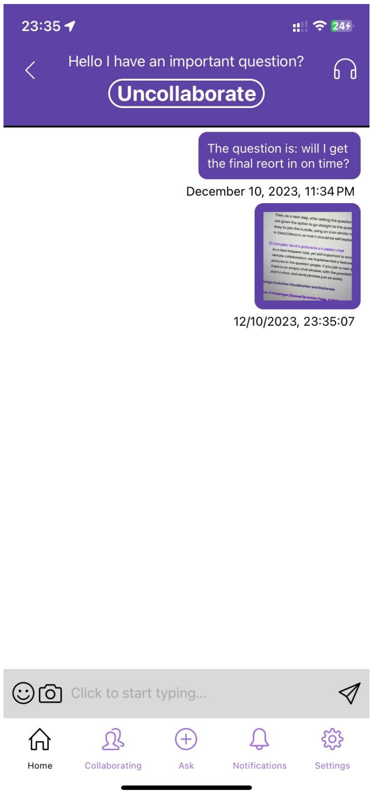
pictures in the question pages. If you join a new q
there is an empty chat window, with the possibilit
start a chat, and send pictures just as easily.

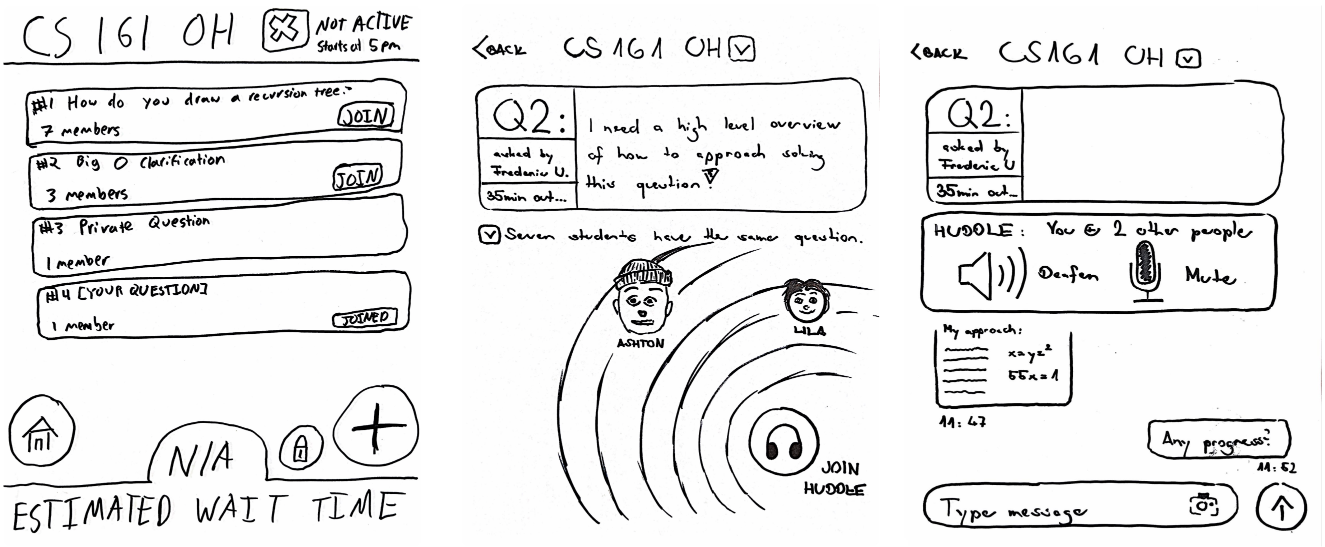
esign Evolution Visualization and Rationale

w-Fi Prototype (Queue/Question Page, Collaboration


23:35
Hello I have an important question?
Uncollaborate
The question is: will I get the final reort in on time?
December 10, 2023, 11:34 PM
12/10/2023, 23:35:07
Click to start typing...

Design Evolution Visualization and Rationale

Low-Fi Prototype (Queue/Question Page, Collaboration Page)



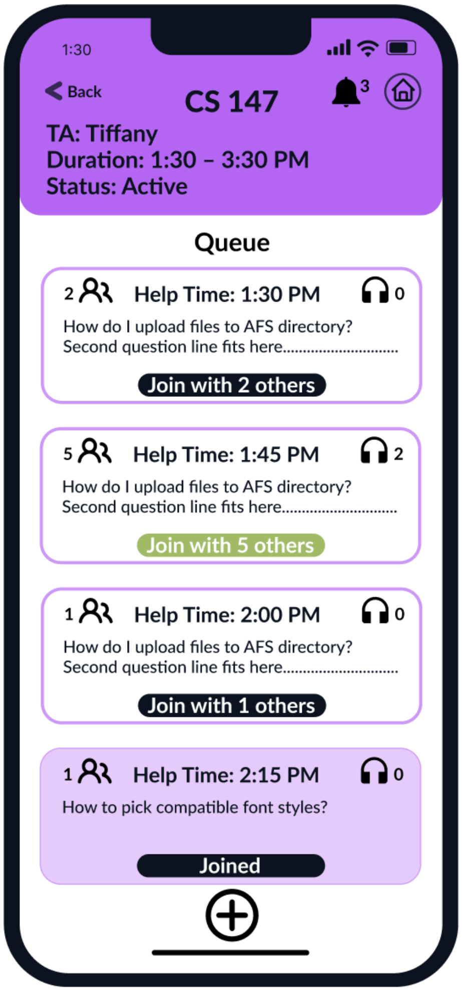
Our first drafts for the queue and the collaboration page were mainly geared to give prototype testers a rough idea of what our app is about and enable feedback/observations.

The evaluation technique was a paper prototype, evaluated in person and through Zoom, checking whether tasks were successfully completed, and how learnable the interface was (by measuring the time taken for task completion across repeated frequent tasks and how the time decreased over time).

The queue page (left) showed all the questions in the class, and users clicking on them led to a detailed question overview (right). The earliest version had a screen between the question and the actual huddle page (center), and we observed that people were confused or didn’t realize how to enter the huddle.

Also, the huddle interface required too much space to enable space for texting, so we changed that in the second iteration. On the bright side, though, the interface overall was quite intuitive and highly learnable, with testers having no issue to complete most of the tasks – and do so fast.

Med-Fi Prototype (Queue/Question Page, Collaboration Page)



CS 147

TA: Tiffany
Duration: 1:30 – 3:30 PM
Status: Active

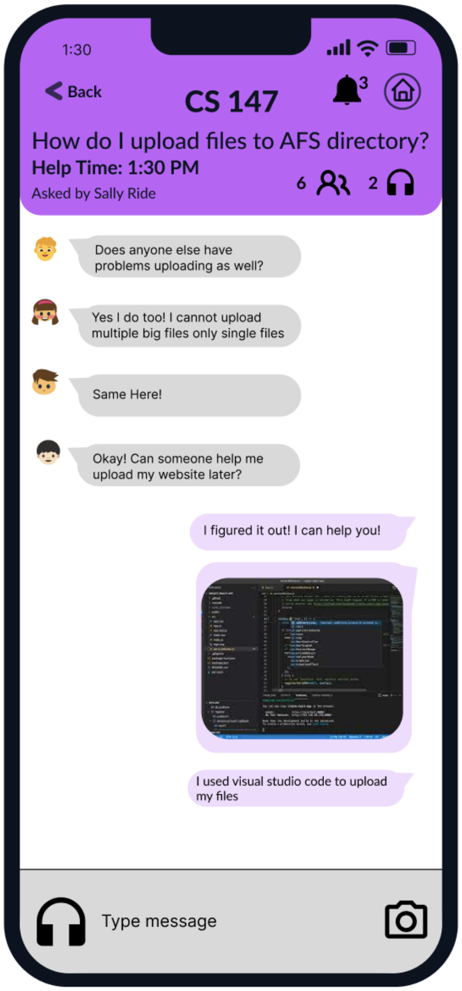
Queue

2 Help Time: 1:30 PM 0
How do I upload files to AFS directory?
Second question line fits here.............................

5 Help Time: 1:45 PM 2
How do I upload files to AFS directory?
Second question line fits here.............................

1 Help Time: 2:00 PM 0
How do I upload files to AFS directory?
Second question line fits here.............................

1 Help Time: 2:15 PM 0
How to pick compatible font styles?



CS 147

How do I upload files to AFS directory?
Help Time: 1:30 PM
Asked by Sally Ride
6 2

Does anyone else have problems uploading as well?

Yes I do too! I cannot upload multiple big files only single files

Same Here!

Okay! Can someone help me upload my website later?

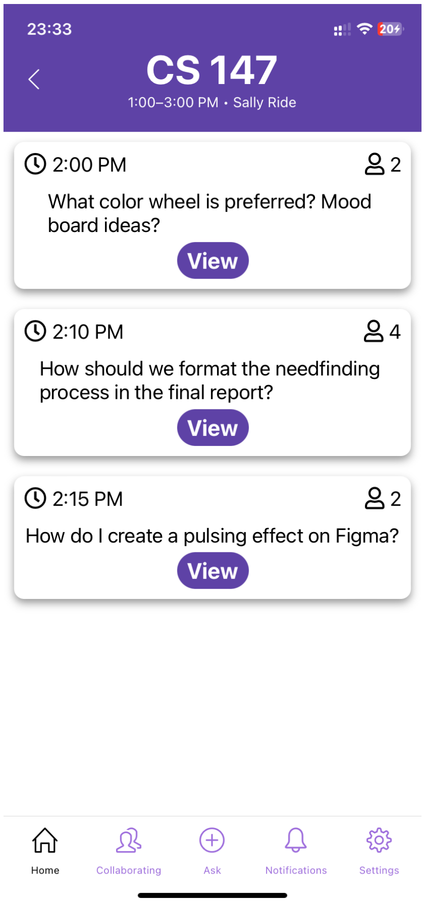
I figured it out! I can help you!

I used visual studio code to upload my files

The med-fi prototype was much closer to the final app, including a clear indication of which question a user had joined (violet overlay). In the med-fi prototype, we also created a "Similar Questions" page, and a "Collaborating" page that referenced all questions a user is currently collaborating on.

The evaluation of this interface took place using Heuristic Evaluation. For details on what was pointed out and changed, please see the "Heuristic Evaluation" section later in this chapter.

High-Fi Prototype (Queue/Question Page, Collab. Page)



23:33

CS 147

1:00–3:00 PM • Sally Ride

2:00 PM — 2

What color wheel is preferred? Mood board ideas?

View

2:10 PM — 4

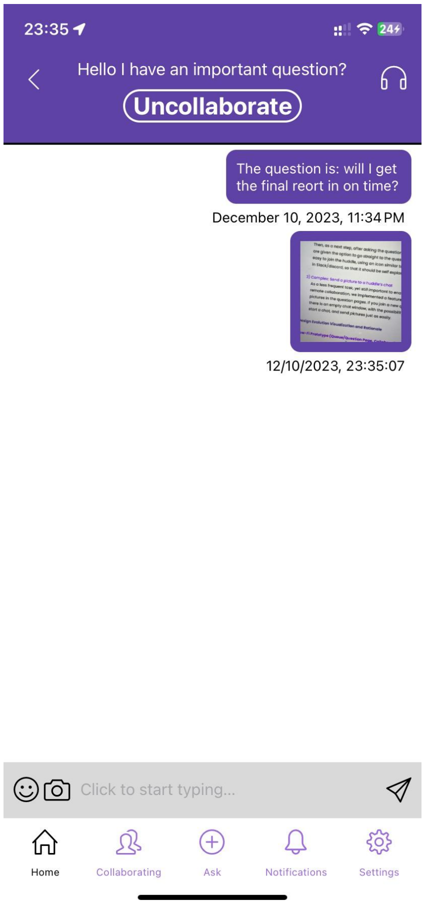
How should we format the needfinding process in the final report?

View

2:15 PM — 2

How do I create a pulsing effect on Figma?

View



23:35

Hello I have an important question?

Uncollaborate

The question is: will I get the final reort in on time?

December 10, 2023, 11:34 PM

12/10/2023, 23:35:07

Click to start typing...

The above pictures depict the final high-fi prototype. Some of the most obvious changes are that the queue page is less cluttered both in the top bar and in the boxes representing each question. In the question page, the top bar is less cluttered and the text in text messages is larger for easier readability. More detail on changes made between the med-fi and the high-fi prototype, please see the following section.

Heuristic Evaluation

A list of serious violations and the corresponding fixes follows. This list includes some Level 1/2 violations we deemed important, too.

ALL TASKS:

- No documentation/guide → cleared up icons, provided FAQ
- Text too small and inaccessible → increased size
- Purple too bright → used purple that is softer on eyes
- Notifications for every time someone joins/leaves huddle seems extraneous → only send important notifications
- Huddles/any audio can be inaccessible → disregarded, in a final version we'd like to include auto-transcription of what is being said, but felt this was beyond scope of class
- Prompting question asking before queue seems to work against collaboration → changed layout so that after joining an office hour, user can see others' questions right away
- No option to leave question → added option to uncollaborate

- No option to resolve/delete/close question → disregarded, would be a nice feature for final app if built, but didn't feel crucial to enable the 3 task flows for prototype
- Have to ask before seeing similar → now allow users to search questions before being prompted to ask
- Course page seems unorganized → sorted courses and put courses with active office hours at top
- "ASK" is unintuitive → the ability to ask before office hours start felt important, but by re-ordering the office hours page and explicitly listing a course as "not active" we made it more clear what the difference between join and ask is
- No option for anonymous questions → added option
- Screens inconsistent → changed icons in different pages so screens mirror one another, are internally consistent

SIMPLE:

- No way to see user's own joined questions → all the questions a user is collaborating on are visible on the "collaborating" screen, all the questions they have joined in the notifications screen
- Costly to have to join similar question to view its full details → added max. length of question that is all visible in overview so that question doesn't need to be opened to see details

MODERATE:

- "Silent" is unintuitive → changed to intuitive icons, no script

- Not obvious that huddle expands to more options → fully reworked huddle design to be more clear, no hidden menu
- Too many buttons when menu expanded → fully reworked huddle design to be more clear, no hidden menu
- User can begin audio by mistake, holding can be unintuitive and inaccessible → not joined by default, just press button to begin audio
- Only option to add text for question → disregarded, the idea is that a person briefly summarized their question, more detail can go into the chat (e.g. as a picture)
- Similar questions page unintuitive → change process, now instead focused on encouraging user to see if there's a similar question since we had limited NLP chops, in a final version we'd implement as an extra screen saying "See if you can join a similar question" to make it more clear
- Guiding message in huddles too long → removed message
- Unclear when huddle has been joined, screen is exact same → added red blinking dot to show huddle is active
- No option to delete chat message → disregarded, we think that there should be a clear record, people can send a second message like one would in SMS communication when they need to correct an error

COMPLEX:

- Photo sends right away → changed process to allow users to edit (draw, crop, etc), cancel, or retake photo

- Camera icon inconsistent to other icons with circle outline → standardized icons used, including camera icon

Values in Design

There are three key values embedded in our design:

#1 Efficiency: Our tool for scheduling office hours and getting help ultimately is designed to save people time – both the time of students and the time of overworked teachers and TAs. So they can learn more/teach more per unit of time.

This is visible in design features such as prompting students to join other similar questions and thus grouping students together to save teacher time (not fully implemented in high-fi prototype, but a design feature we were planning for), or prominently displaying the time it takes until help arrives in the queue page.

#2 Approachability: Asking questions, especially publicly, can be hard. Our app should be accessible, intuitive to use, and invite students to engage with others on the Same Q platform.

To achieve this, we invite casual collaboration in a familiar setting, with the help of an intuitive chat interface inside every question, that doesn't require much thought or many steps to jump through to strike up a conversation – students are familiar with it from iMessage, WhatsApp, etc. In addition, we implemented the value of approachability by giving a clear starting point: at the heart of the bottom bar, the option to add a question – i.e. the first step to collaboration – is prominently featured to give students a clear and highly approachable starting point.

#3 Collaboration: A common thread all the way from our early interviews is that everyone benefits when students help each other. Collaborative features should be prominent and useful.

Here’s how we have implemented the value of collaboration: by having an overview of all the recent activity (notifications), we make it easy to stay in the loop of what happened? Someone answered your text? Someone joined your huddle? Students will be in the know – it’s all in one place. Additionally, seeing fellow students' questions creates moments of realization: “oh, I have that question, too.” Lastly, the huddle and message features themselves are answers to the goal of enabling collaboration, too.

Value Tensions:

Of course, there were some tensions, too, like Approachability and Efficiency being at slight odds: Power users want to jump right to where they want to go, but giving new users clear first steps makes their experience easier. To get the best of both worlds, we offer a clear default option (ask a question) with an easy “skip” available (joining office hours and seeing the queue).

Additionally, there's also a tradeoff between Collaboration and Efficiency. Collaboration is frequently time-consuming. That's why our goal isn't merely to save students time, it is to make their time spent waiting more productive, and enable them to get a deeper understanding to their questions via collaboration.

Final Prototype Implementation

Tools used: React Native and Supabase

React Native: As a standard for cross-platform mobile development in industry, one of our main motivations to use React Native was to develop our skills with the platform. One of our team members was familiar with React, another was currently taking 147L (a React Native course), and the others were familiar with JS/CSS/HTML frontends, making the learning curve softer. It is clearly a powerful tool, especially when combined with Expo for easy testing. We appreciated the ability to visualize our changes in real time and seamlessly hook into iOS platform features like the camera and keyboard.

Even so, React Native was challenging to use. The platform is frequently idiosyncratic. Different types of touchable accept different contents depending on their container and positioning method, and its asynchronous handling of state updates frequently produced bugs during development. There is no easy way to store data across components without using some kind of database or third-party module like Redux. While we would probably use it again for a future project, a more formal understanding of its nuances and spending more time setting up our project following best practices would be necessary.

Supabase: Given the collaborative nature of Same Q and the complexity of setting up even local on-device storage, we opted to set up a database. In hindsight, we aimed to high. On the recommendation of CS147L, we selected Supabase.

It probably isn't fair to comment on the merits of Supabase as a product, however, because we failed to set it up in a thoughtful way. Instead, because of check-in deadlines and the availability of the team members with the most technical expertise, we wound up implementing the database relatively late in development. This prevented us from following best practices and forced us to build the database setup around the way we had designed the app, rather than writing our app to be compatible with our database setup.

Our mistakes aside, we found Supabase to be quite slow and frequently buggy. As a result, data sometimes takes time to show in the app, stops showing after a period of extended use, or duplicates itself. Luckily, these bugs generally don't interfere with evaluating the visual design of the app and can almost always be fixed by reloading it from the expo console.

Wizard of Oz

To simulate the experience of being in a huddle, a sound plays whenever you join a huddle.

Hard-coded elements

- **Courses** – We did not develop sign in or course registration features, so each user has been preemptively added to three courses (CS 161, CS 147, and ENGLISH 9CE).
- **Filler pages** – We wanted to represent where features not necessary to our three tasks but necessary to the final version of the app would appear in our UI. As a result, you can find filler pages (Profile, Most Frequently Collaborated, link to Canvas, and additional pages linked through the Settings page), throughout the app.
- **Notifications** – To show how we would represent notifications and give the user an impression that things are occurring on the app, we hardcoded in a static notifications page that always displays the same notifications.
- **Faked Question Activity** – Again to simulate the experience of collaborating using the app, some questions are pre-populated with chats. In addition, questions are hardcoded to show a fixed number of collaborators that have already joined.

Reflections

Design Thinking

Formal processes for design require a leap of faith. When you just hear about them in a lecture hall, they feel a bit silly, maybe overly formalized, or just a slow way of doing a normal task. Sometimes, that's completely true. Not every design technique is perfect for every project. Generally, though, you get it when you dive in, and realize that for all the silly formality of it, it genuinely gets you out of designing with your biases and your gut, and into designing with your empathy and your brain.

Studio Theme

Learning is a difficult process to insert technology into, especially as an assumed solution (as it is in a class about user interface design). Talking with our interviewees at the beginning of the quarter, they were often skeptical of new technologies as applied to education. They'd been burned one too many times by a product that promised to make their lives easier, and in reality didn't. This seems to be an area in which techno-solutionism is particularly rampant.

We're happy with Same Q because we believe it represents genuine strengths of technology: fast communication across distance, and the aggregation of information. That said, who knows what we would have created if we didn’t know the end result would ultimately be an app.

Same Q

This class covers an enormous amount of ground in a very short amount of time, and that is both a good thing and a bad thing.

Our final product is representative of this tension: both something we’re very proud of as the clear amalgamation of an enormous amount of learning in a very short amount of time, and a patched-together craft of revision after revision.

Next Steps

While we focused largely on the student side of things (since those are most necessary to demonstrating the fundamental value proposition of the application), our true market and power users are teachers. Given more time, we would have loved to build out a whole second set of tasks for teachers. Of course, this entails the simple administrivia of creating courses, viewing questions, and so on, but we think there is a lot more to be explored.

In particular, we think Same Q has the potential to provide enormous amounts of useful data to teachers, by assessing which questions their students most commonly have each year, how engaged they are in helping each other solve those problems, and so on.

Talking with judges at the project expo, we also got the idea to have teachers mark answers given by students to other students as a correct and thorough explanation. These “Good Answer” badges could show up on the students’ profile, serving as a sort of social commendation for their efforts. Potentially, similar achievements could be handed out to students that ask a question many of their peers share or that is especially incisive.

Finally, there is always more polish to be done on the app. We think that spending more time with the visual design could be helpful—we were often reacting and adjusting to HE and studio feedback, and getting a chance to rethink our approach and address some of the flaws in our concept (i.e. you currently cannot schedule a question for a specific time). In addition, with additional time we could have substantially rewritten the initial codebase for the app and database implementation, as to set us up better for further development and prevent bugs.