

# Studying The Emotional Impact of Hybrid Learning

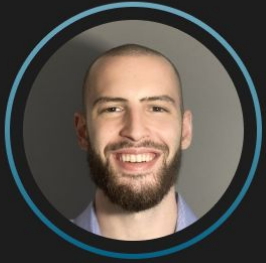
Process Book

## Team CASES

(Charlie, Acalapati, Satchel, Emily, Sullivan)

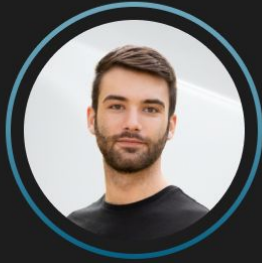
**Professor Paliano**

**SCAD Spring 2021**



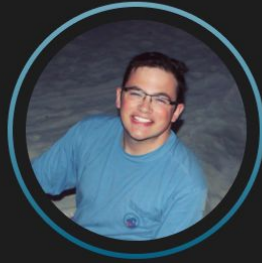
**Sullivan Wilcox**

Project Lead



**Charlie Bowles**

Interaction Lead



**Satchel Hallmark**

Product Lead



**Emily Lee**

Research Lead



**Acalapati Priyatama**

Prototyping Lead

# Agenda.

**01.** Secondary Research

**02.** Primary Research

**03.** Archetype and User Journey Map

**04.** Ideation

**05.** Preliminary Concepts

**06.** Product and Software

**07.** Initial Interaction Model & Sitemap

**08.** User Testing

**09.** Improvements

**10.** Final Deliverables

**Problem**



**Research**



**Insights**



**Design**



**Prototype**

**Solution**

**Discover**

**Define**

**Develop**

**Deliver**

# Executive Summary

## SPARK

### PROBLEM

Many schools have implemented hybrid learning systems, but it is not enough for an emotionally engaging, collaborative, and honest learning environment for both students and teachers.

### SOLUTION

Spark is a hybrid learning product with a 360-degree camera, mic, and speaker integrated with a video conferencing platform that facilitates a more intuitive and collaborative learning environment.



### Spark Hub

The teacher hub is a stationary docking station that alerts and facilitates interaction between online students and in-person teachers through a 360 degree auto-tracking camera, audio input, light, and remote.

### Spark Remote

The remote features a microphone for quick feedback and can control the audio and video settings, as well as basic functions of the video conference.

### Spark Software

Featuring a reimagined meeting experience, Spark shows all the students' shared screens at once, with a better messaging and feedback system. The platform also adds a social aspect to discussion posts with a class forum that students and teachers can look back on for feedback and questions. Lastly, the recordings include analytics to give the instructor a better understanding of their class's performance.

### Docking Station

The teacher tablet docks into the stationary hub when the teacher is not actively moving in order to promote a seamless transition between their desk and navigating the classroom.

**01.**

**Secondary Research**



**As students start to return to the classroom, schools have had to adopt some form of hybrid learning for their students and teachers.**

What do we mean by  
**hybrid learning?**



## **For our project we will be focusing on...**

Hybrid classes that have students both joining in person and online at the same time. We're choosing this specific form of hybrid because we saw it as the biggest opportunity space for improvement.

How does our topic space tie in  
with **emotion**?



**“Classrooms are emotional settings. Students’ emotional experiences can impact on their ability to learn, their engagement in school, and their career choices. Yet too often education research ignores or neutralizes emotions.”**

**Kelly Trezise**

Postdoctoral Researcher

The online portion of hybrid learning has **two major issues.**

# 01

**The online portion lacks interpersonal connection with classmates and teachers, decreasing engagement and creating a non emotional environment.**

# 02

**Teachers are forced to use a variety of different software and learning management systems to create an effective hybrid class, which takes away the flexibility that hybrid can offer.**

The in person portion of hybrid learning has **one major issue.**

# 01

**The main problem with in person sessions of hybrid classes is the instructor having to balance teaching both students online and in person at the same time.**

- Teacher's struggle to create the same learning experience for both those joining online and in person
- Students joining in from online may not even see or hear the students attending in person, creating an even larger interpersonal gap than an all online model

# Original Target User

Primary

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Students

Secondary

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Teachers

Tertiary

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Parents



## Original Target User

Primary

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Students

Secondary

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Teachers

Tertiary

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Parents

Primary

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**Teachers**

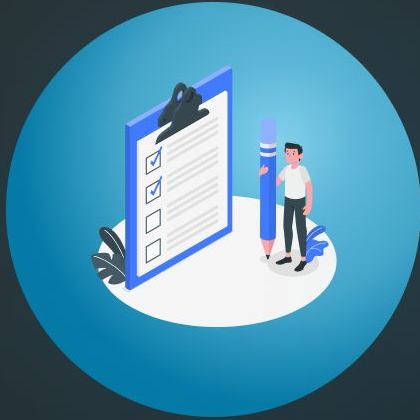
## **Primary Target User: Teachers**

We are switching our primary target user to teachers specifically, because focusing on a better instruction environment and setup will benefit the student far greater than prioritizing the student experience first.

# Problem Space

The current setup for teaching hybrid classes that have both online and in person students, doesn't allow for an emotionally engaging, collaborative, and honest learning environment.

# Original Research Plan



## Surveys

Gain data points that can help us pinpoint specific problem areas during their learning experience and their psychology correlated to the hybrid learning system.



## Diary Study

Help understand the correlation of environmental and psychological impacts of hybrid learning.



## Interviews

To gain further insight on what aspects our target audience feels during their hybrid learning experience

# Updated Research Plan

2

Hybrid Students

## Observation

Gain data points that can help us pinpoint specific problem areas during their learning experience and their psychology correlated to the hybrid learning system.

6

Hybrid Teachers

## Diary Study

Help understand the correlation of environmental and psychological impacts of hybrid learning.

17

10 Hybrid Teachers  
7 Online Teachers

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5

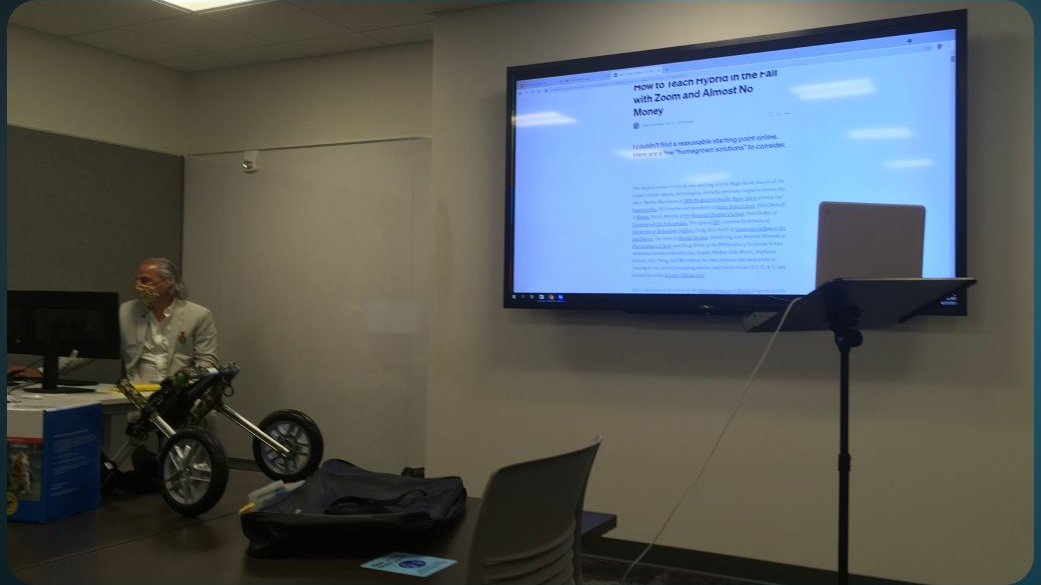
Hybrid Teacher  
Participants

## Focus Group

To gain further insight on what aspects our target audience feels during their hybrid learning experience

# Observations

Observation studies help us see what our target users really do when confronted with various choices or situations.



# Diary Study

## We had hybrid teachers answer questions like...

Chronologically, describe what you did before or in preparation for your classes today?

How has your teaching style changed from when it was in-person vs. online vs. hybrid?

What are some of the biggest differences you would say from a students perspective when joining the class in person versus joining online?

How is your overall feeling about the current hybrid teaching system?

### SCAD Hybrid Teaching Experience

Welcome to our CASES User Study! Thank you for taking the time to help us collect data regarding your experience with Hybrid teaching. Please keep in mind that all information provided will remain completely confidential. Speak as freely as you wish! If you have any questions feel free to contact us.

ID title

Basic Information

\*What is your name?

\*What grade(s) do you teach?

\*What subject(s) do you teach?

e.g. Math, English, History, Science, Art, Band, etc.

\*How do you teach?

Virtual  Hybrid  In Person

\*What was your emotion towards teaching fully online?

1 - Extremely unhappy 5 - Extremely happy

1  2  3  4  5

\*What was your emotion towards returning to the classroom with hybrid?

1 - Extremely unhappy 5 - Extremely happy

1  2  3  4  5

During Class

Chronologically, describe what you did before or in preparation for your classes today?

# Interviews

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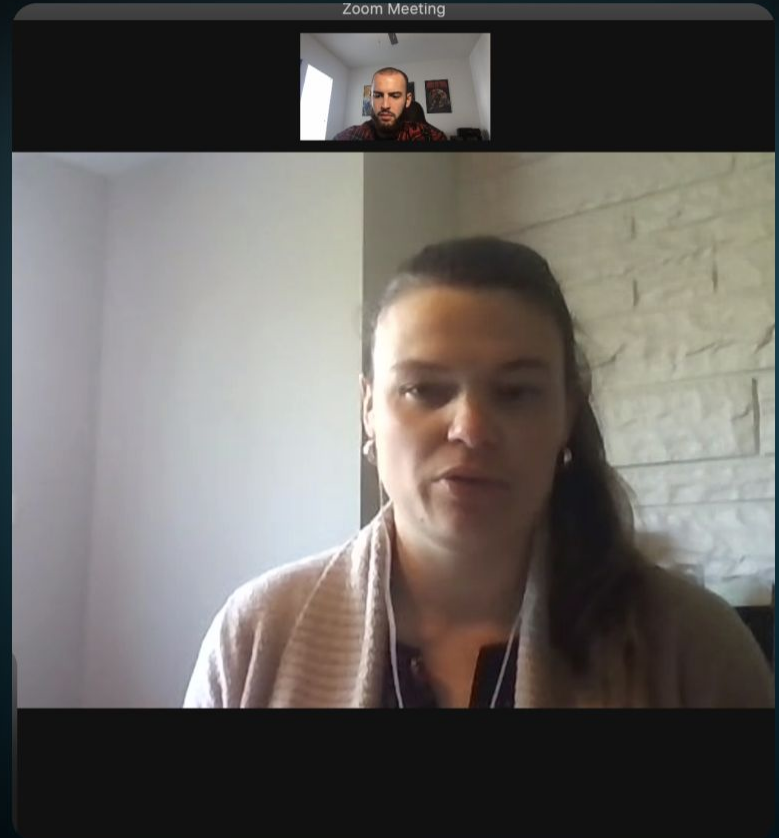
## We asked hybrid and online teachers...

How do you manage to keep track/see what your online students are doing during a hybrid or online class?

Currently how do your students communicate with each other in class both online and on ground?

In a hybrid or online learning environment, do you feel like you have more or less flexibility than you would in a fully in-person environment? Why?

What are your biggest struggles with teaching both online and in person students at the same time, or just online?





# Focus Group

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## We asked our focus group...

After switching to hybrid, in what areas have you and your colleagues struggled the most?

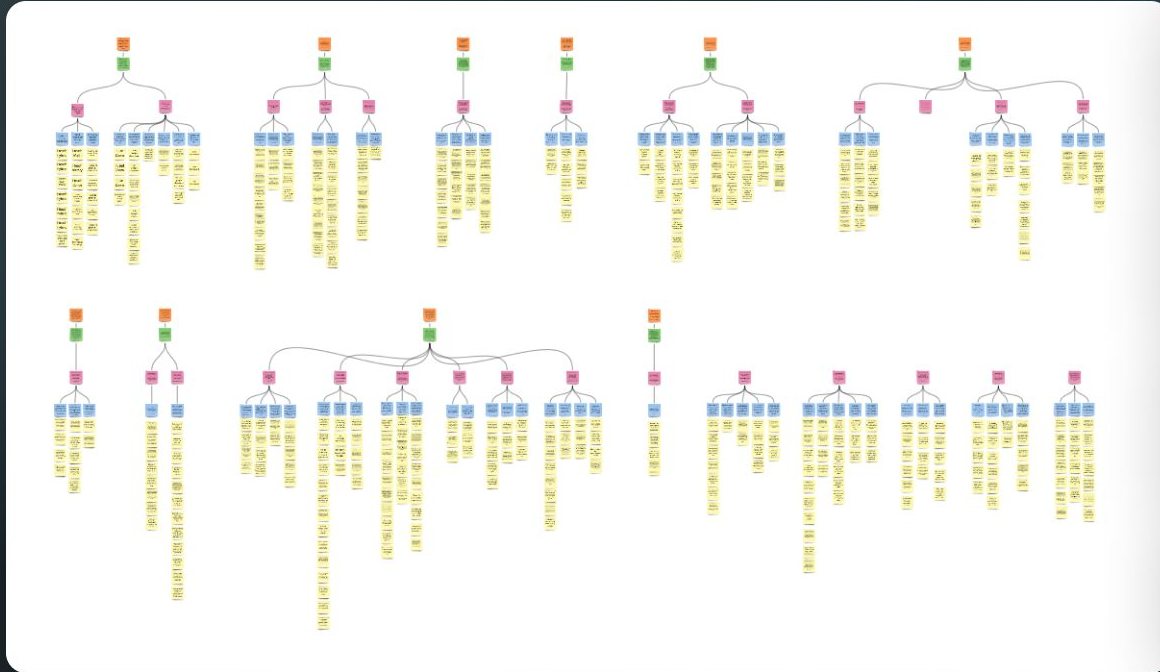
How do you balance trying to give both the online and in person students the same experience?

For the students joining in online who may have their video's off and mic muted, how do you try to keep track and see how they are progressing in your class?

What are some of the biggest things me and my team should try and focus on as we try to improve the hybrid teaching experience?



# Affinity Mapping



**508**

Yellows

**87**

Clusters

**9**

HMW

**2**

Overarching  
HMW

# Research Insights

Academic integrity has been a problem for teachers as online students are unwilling to share their screens, which leads teachers to give more work to students to makeup for the lack of exams



Integration between the tools chosen by an institution for their teachers have not always been adequate to suit the needs of teachers teaching in hybrid learning environments, as a result, several technical and software related issues along with a lack of interpersonal connections are formed



Many students feel lonely, and teachers fail to teach and communicate with their students effectively due to a lack of connection and communication, which led teachers implementing new teaching styles to try and better class community



Teachers and students in a hybrid environment struggle to achieve the level of feedback they once had which delays the teacher intervention in student understanding, resulting in it taking longer for students to grasp concepts; creating a more sever divide between students that understand material and those that do not



Hybrid learning is not as effective because students have to work independently, which leaves online students more at risk to fall behind because they don't have the same opportunities for communication and feedback as the students attending in person



Online students often get neglected due to a lack of motivation to participate because they are easily distracted, less confident, and overwhelmed with the new learning environment, while in-person students get more acknowledged, so teachers either have to make it mandatory to have video and audio on or to call on the specific students to help create a better class community



Teachers have difficulty identifying fundamental mistakes of online student's work earlier, because teachers can't see much of the students process or can't catch as many mistakes from screen-shares or single images



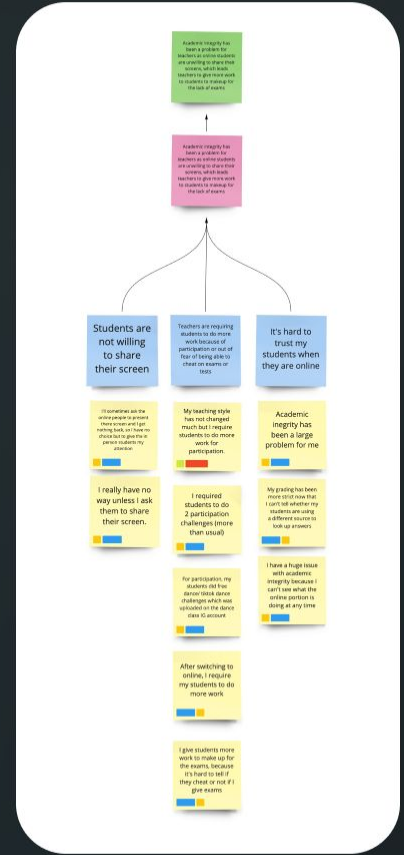
Individual LMS' struggle to meet all the needs of instructors in a hybrid environment which results in teachers spending more time and energy preparing and organizing course content, leading to distractions, lack of structure, and disorganization which disproportionately affects online hybrid students who are already susceptible to distractions and confusion



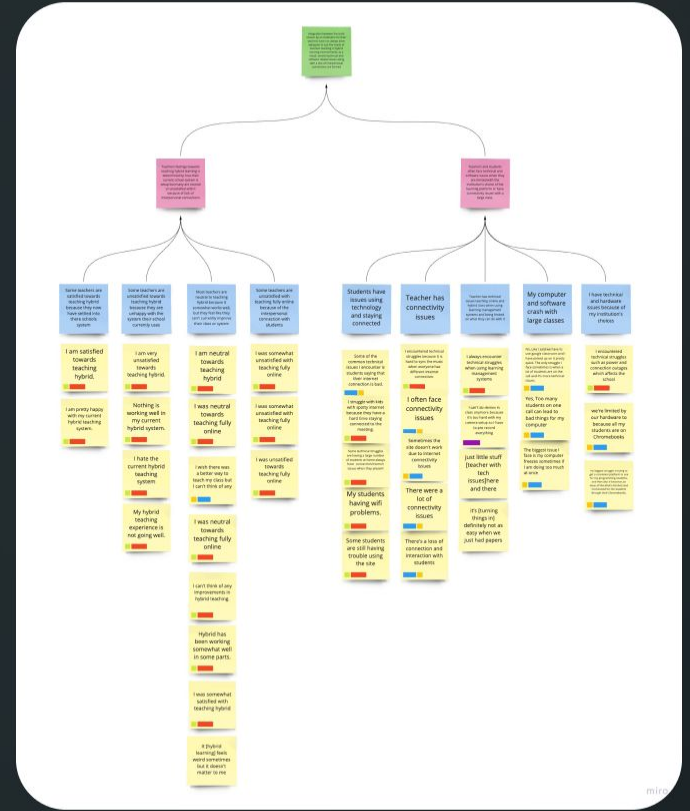
It's difficult for teachers to prepare and organize quality content while balancing instruction for both online and in person students at the same time, which doesn't allow for flexible teaching and feedback that causes unbalanced levels of communication for both types of students



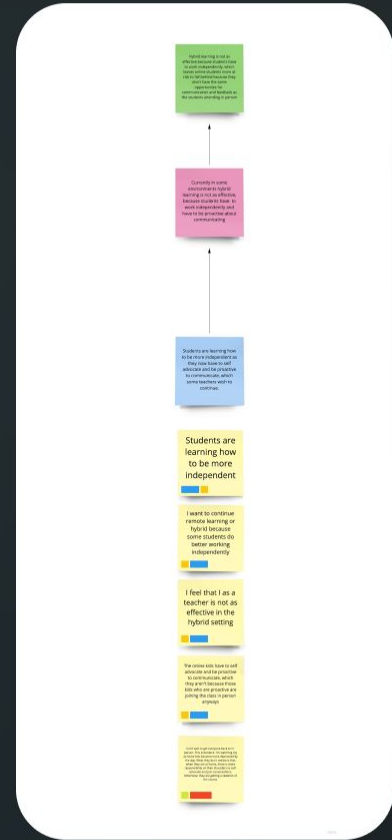
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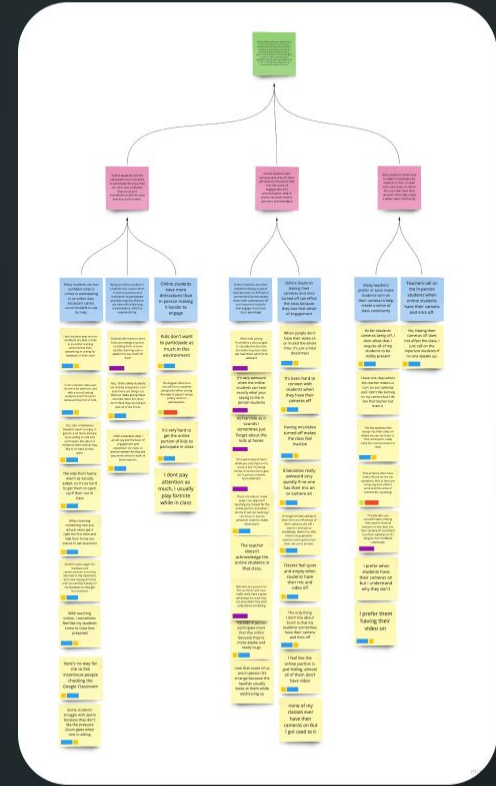
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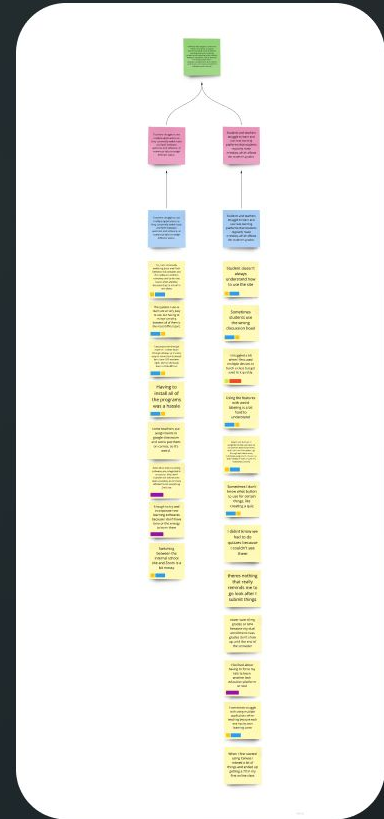
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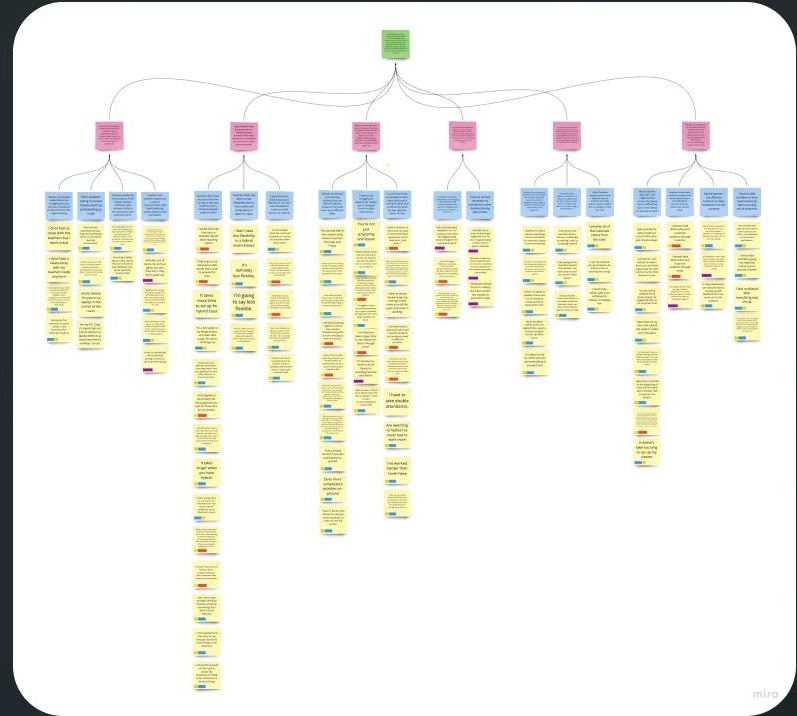


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# HMWs

HMW create an effective hybrid learning environment where both in-person and online students can equally contribute and get acknowledged?



HMW engage online students' participation to have their video and camera on and reduce the stress of the new learning environment for a better class community?



HMW we create a system that allows for more detailed and comprehensive feedback to catch more mistakes by encouraging students to show more of their process?



HMW create a hybrid learning environment with stronger academic integrity by utilizing screen sharing, so teachers don't have to assign more work to students to make up for the lack of exams?



HMW provide a way for institutions to allow teachers to freely choose their own platforms for their classes while keeping it integrated within the school's learning system?



HMW we provide teachers with methods and tools to create a better classroom community and increase student communication to create a more intuitive learning environment?



HMW enable teachers to provide quicker feedback to prevent the delay in teacher intervention in student understanding, so it does not take longer for students to grasp concepts?



HMW prevent distractions, lack of structure, and disorganization for online hybrid students who are already susceptible to distractions and confusion, by creating an LMS that requires less time and energy to prepare and organize course content?



HMW promote more balanced levels of communication and feedback in class for both online and in person students by streamlining the experience of preparing and organizing content to effectively instruct both online and in person students?



# Overarching HMWs

**HMW** facilitate a more engaging, collaborative, and honest learning environment that enables instructors to have a better understanding of the needs and emotions of their students, while reducing the time they must spend to organize and prepare material?

**HMW** mitigate uncomfortable interactions by facilitating intuitive collaboration and discussion; enabling students to inform instructors of feedback and concerns while creating a sense of community in the classroom?

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**03.**

**Archetype and User Journey Map**



## Ryan Johnson

Age: 31

Occupation: College Professor

Interests: Science, Hiking, Camping

Personality: Helpful, Serious & Reliable

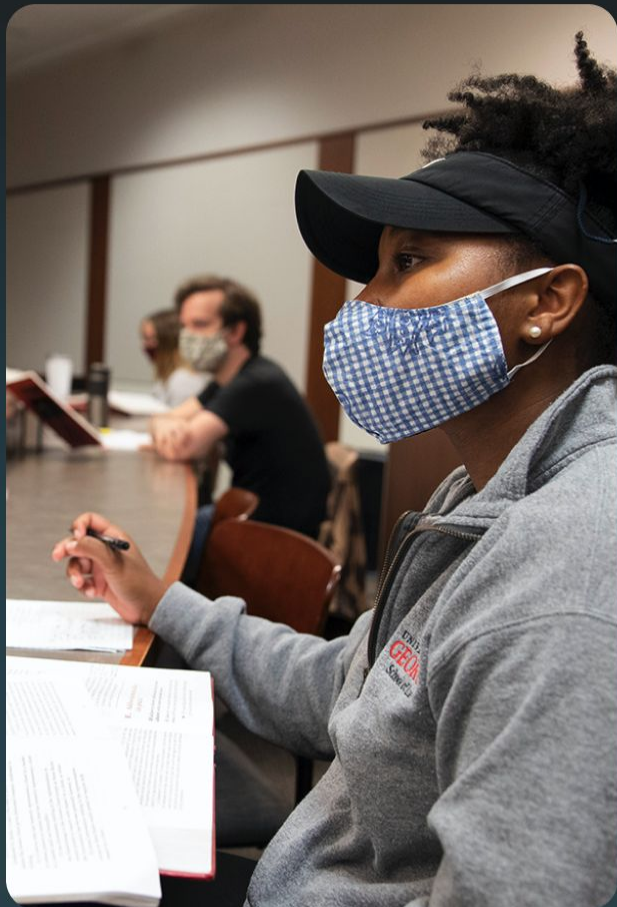
Ryan has been teaching college chemistry classes for the last 6 years. It has been tough for him to adjust his curriculum to fit around the hybrid system his school currently has. He's a very hands on teacher and loves to work with students, but isn't able to currently. He feels as if he isn't as effective as a teacher in this environment and is struggling to build classroom community.

### Goals

- Build stronger classroom community
- More effective teaching methods in a hybrid setting
- More efficient process of creating and grading material

### Pain Points

- Overwhelmed with extra work to teach a hybrid class
- Not being as hands on with students
- Organizing content and material for both online and in person students



## Alyssa Mosley

Age: 19

Occupation: College Student

Interests: Sci-Fi, Reading Books, Yoga

Personality: Extraverted, Curious

Alyssa is a chemistry major currently in her freshman year of college. She's very extraverted and loves to ask questions. She learns the best in a hands on environment. Ever since being fully virtual and then moving to hybrid, it's been a tough adjustment. She feels as if she is falling behind on some material.

### Goals

- Maintain her scholarship at college
- Make sure she isn't falling behind on material despite not being fully on ground

### Pain Points

- Not being able to be as hands on a she would like to be
- Difficulty building a social network due to a virtual and hybrid classes at college



## Martin Jones

Age: 20

Occupation: College Student

Interests: Video Games, Movies

Personality: Reserved, Shy

Martin is currently a freshman in college after taking a gap year out of high school. He's liked being able to take hybrid classes online because he gets to stay home. He's a very shy and reserved student, who sometimes finds it hard to speak up when he's having trouble understanding something. He needs to learn at his own pace, and is scared to ask questions out of fear of being judged.

### Goals

- Maintain strong grades so he's allowed to keep attending school from home
- Understand material so he doesn't have to ask questions or help

### Pain Points

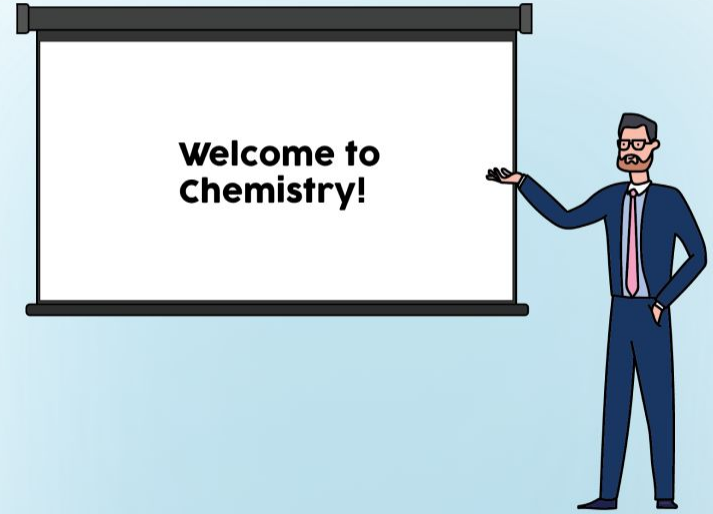
- Finds it difficult to keep up with the heavy workload of a hybrid class
- Having confidence to reach out for help on things he doesn't understand



## Welcome to Professor Johnson's college chemistry class!

Professor Johnson's class is setup to where 9 of the 20 students are allowed to join in person, while the rest of the students join from online.

In today's class they are starting off with presentations about an experiment student's were supposed to conduct at home, that was assigned to them the week before.



**Martin**

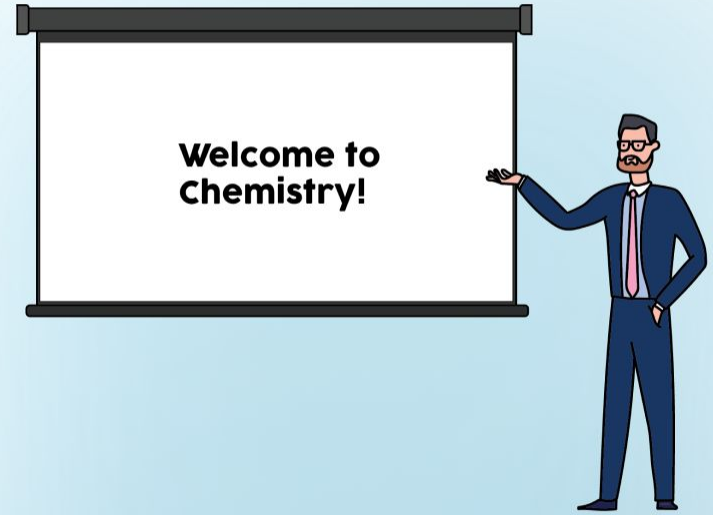


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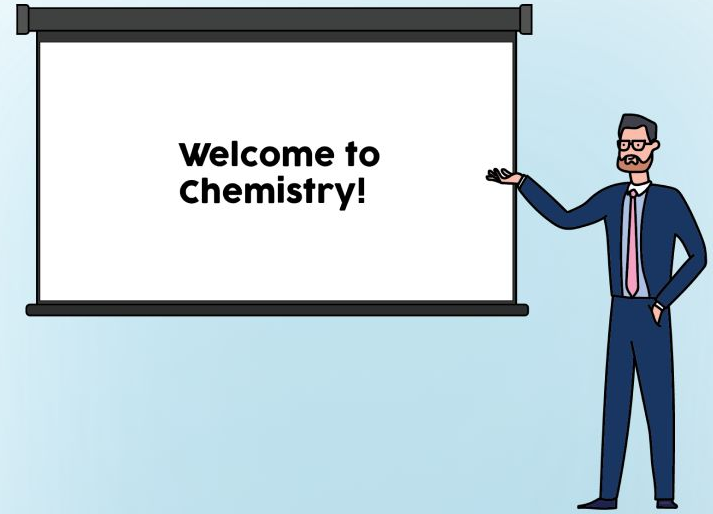


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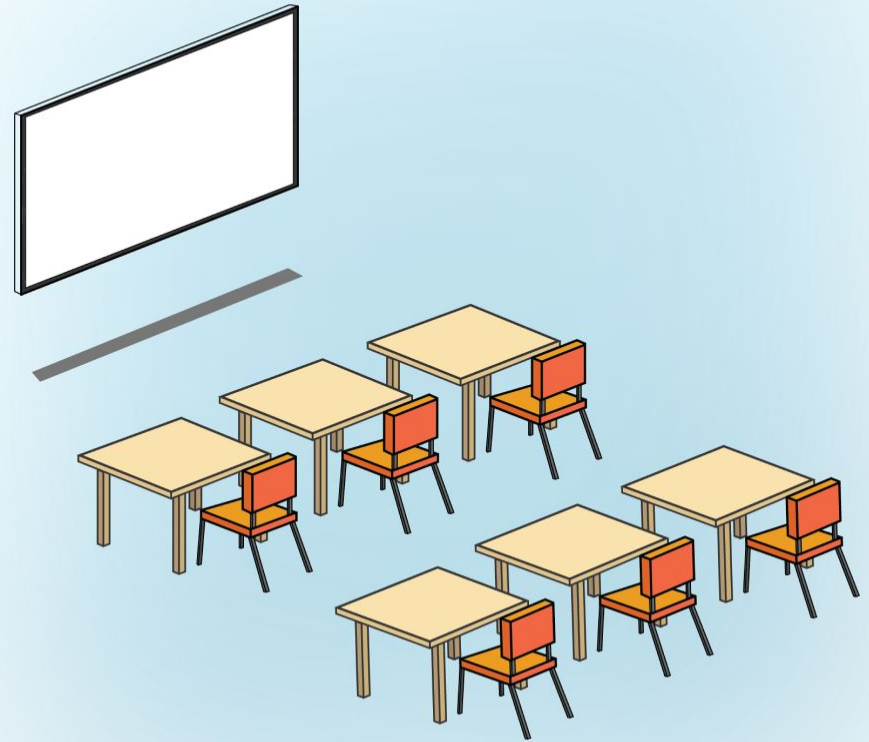


**Alyssa**

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The online students can only see professor Johnson's webcam on his desk and his shared screen.

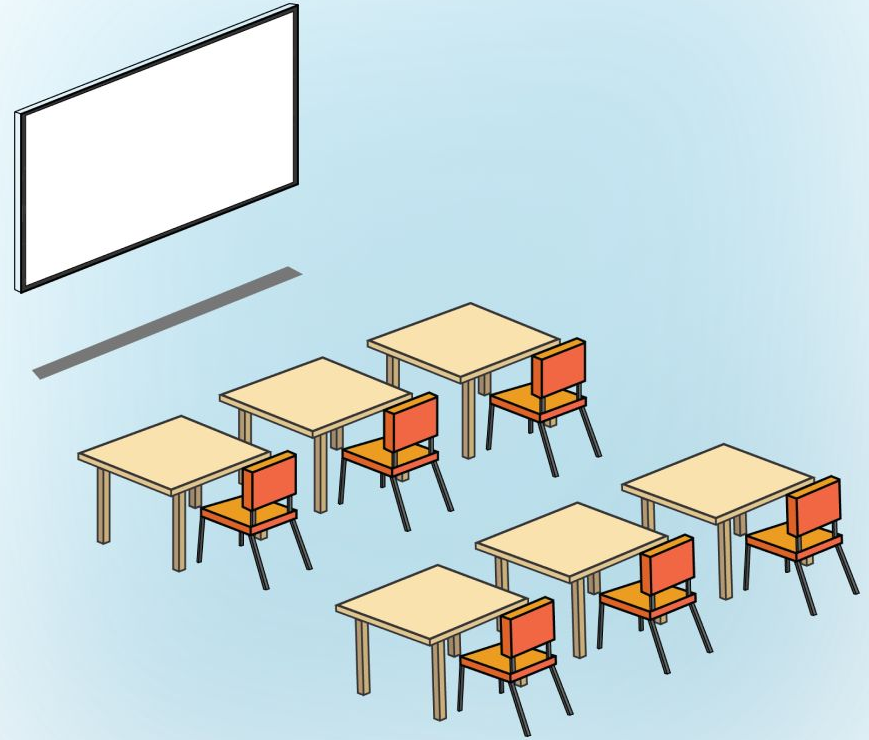
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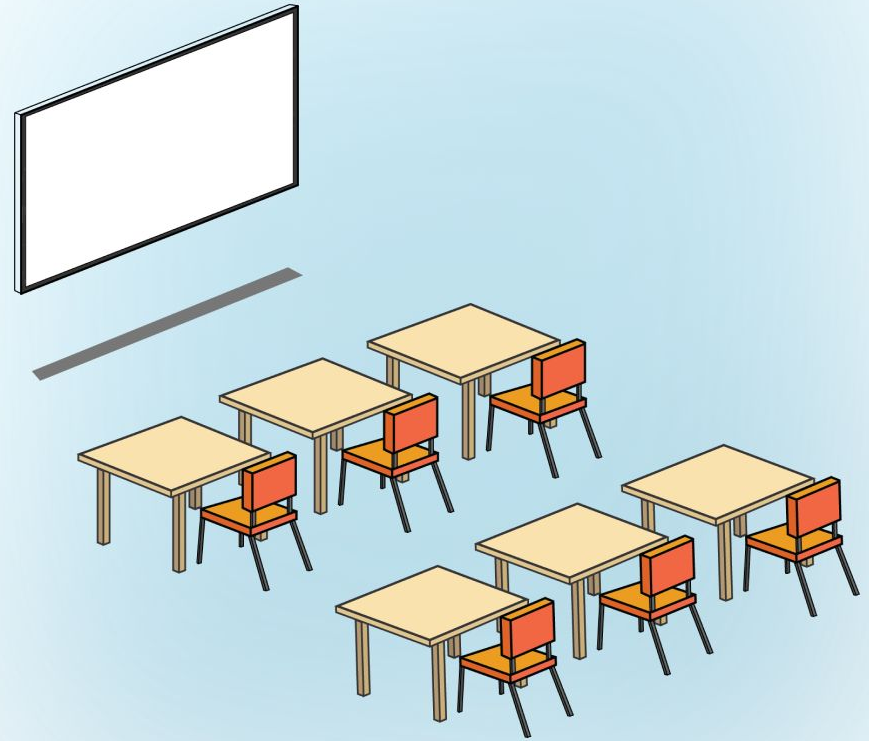
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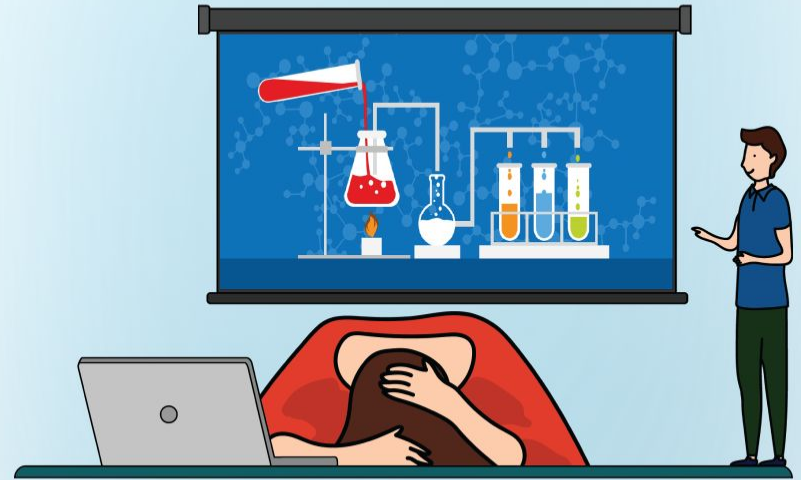
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As this student is presenting, Martin is realizing he did his experiment and presentation completely wrong.

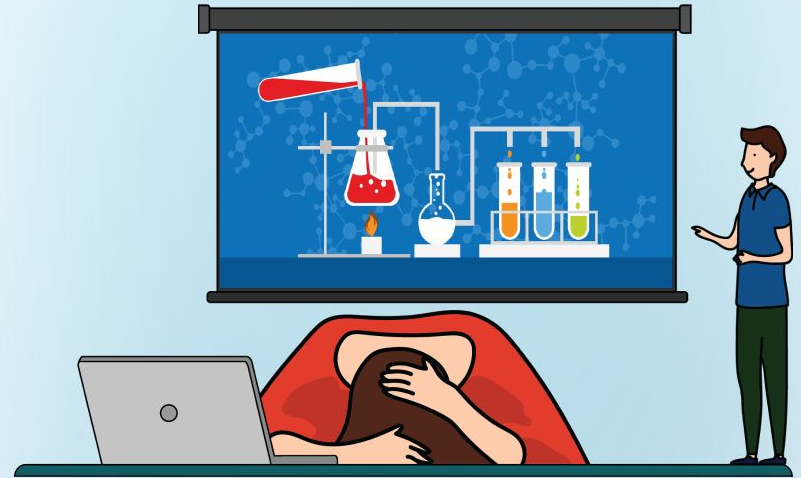
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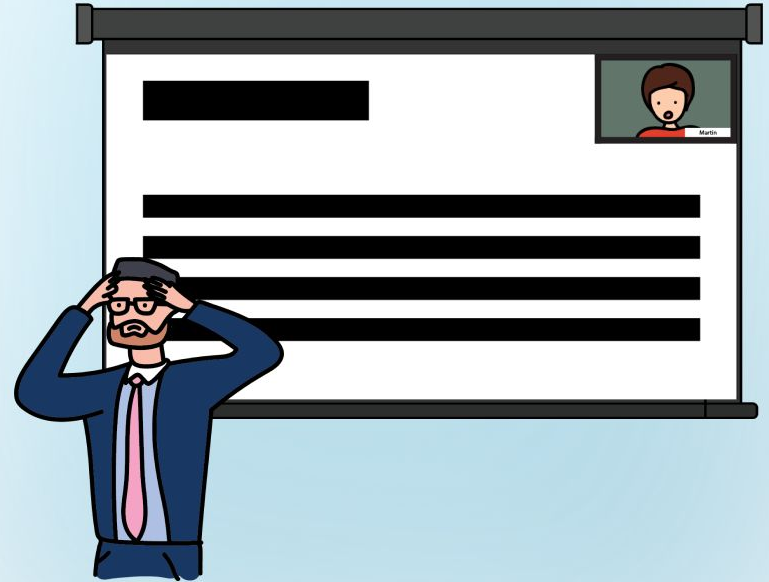
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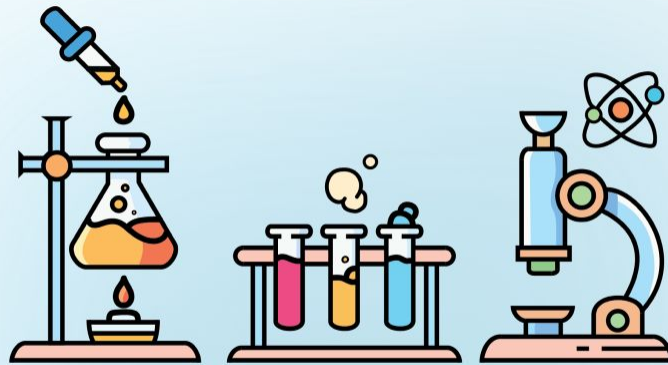


When Martin presents professor Johnson is disappointed not only in him, but also with himself. He is concerned with how the online half of the class could be falling behind, and feels responsible for it.

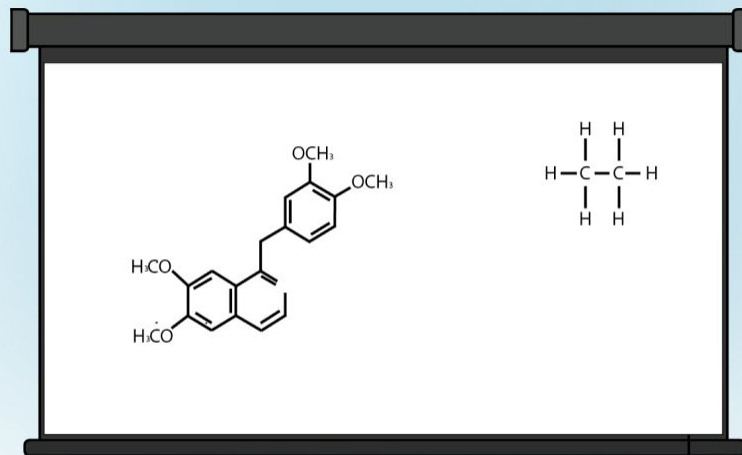


After a few students present, professor Johnson has to move on to the material he needs to cover in class. He wanted to do a live demo in class, but is worried that the online students wouldn't get as much out of it as the in person students.

Because he feels like he doesn't have the right setup to do a demo that work well for both the online and in person students. He has to replace the live demo with a lecture.

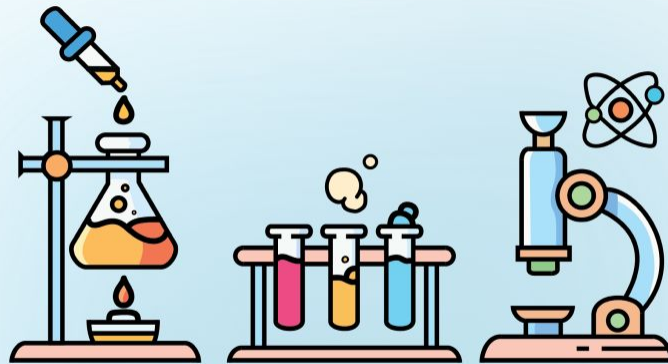


VS

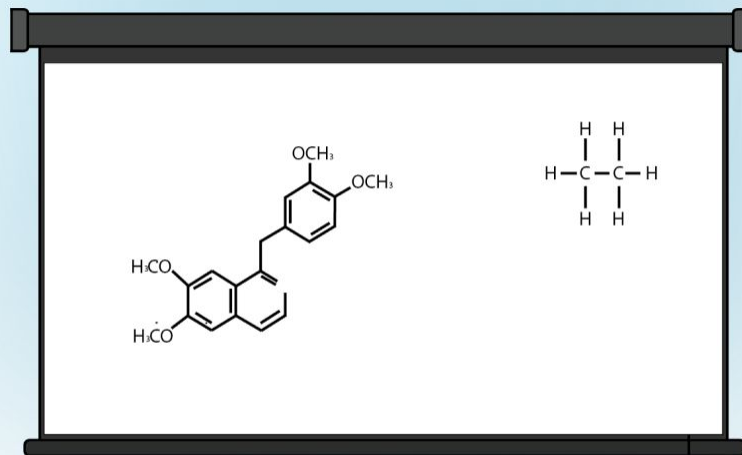


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VS



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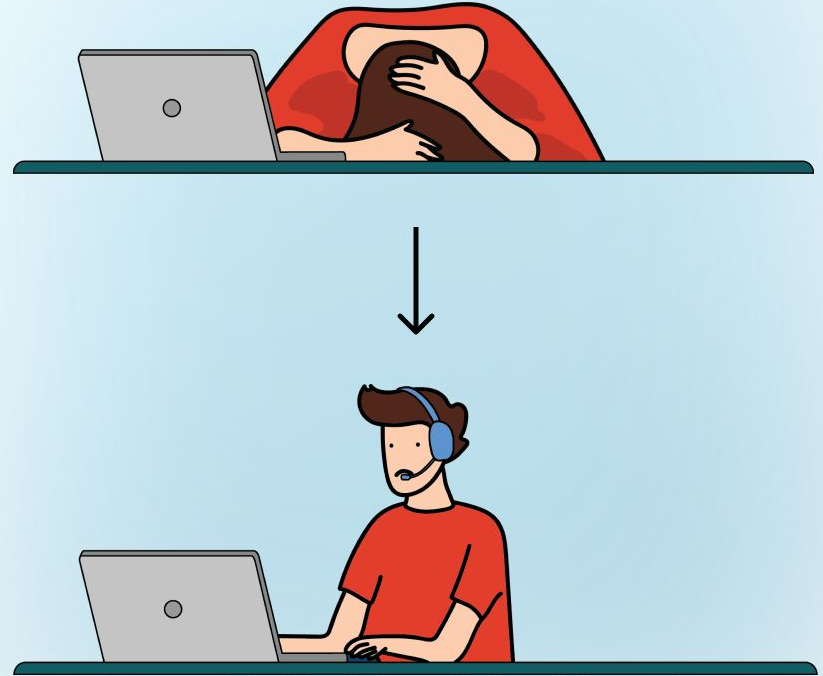
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Alyssa isn't understanding some of the content on the lecture either. Because she's a very hands on learner. The live demo professor Johnson wanted to originally do, would have been great for her.

Alyssa stops professor Johnson to ask a question. He answers it the best he can, but can't spend too much time because he needs to cover all the material for the homework.

Still confused, Alyssa is scared to ask for one of her classmates for help. Because the in person students are distanced from each other, and she can't really see or hear the online students, she hasn't had the opportunity to become friends with anyone in the class.





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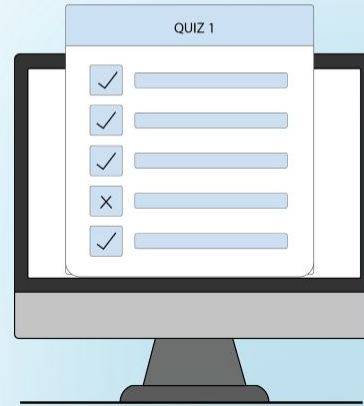
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**Instead, to make up for the lost points he adds more homework. This stresses out both Martin and Alyssa even more.**



**After class professor Johnson wants to put in grades for the presentations on google classroom, because it's easy for students to upload them there using google drive.**

But the school requires him to put his feedback and grading on the schools LMS, which doesn't have as robust feedback features.

So he has to put grading and feedback on both google classroom and his schools LMS, to give his students the detailed feedback he thinks they need.



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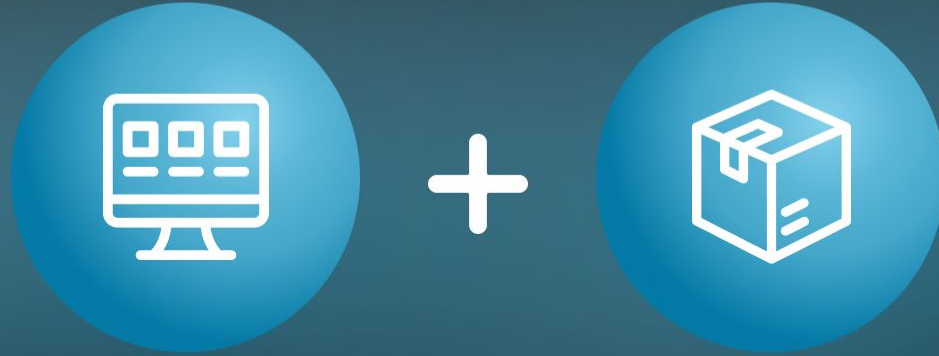
**So he has to put grading and feedback on both google classroom and his schools LMS, to give his students the detailed feedback he thinks they need.**



**04.**

Ideation





**LMS & Product Concept**




# **LMS Concept**

Home Meeting Classwork **Feed** Grades

# CHM 113: General Chemistry I

Professor Ryan Johnson



**Class Platforms**

- Blackboard
- edpuzzle
- Google Classroom

Share something to your class...

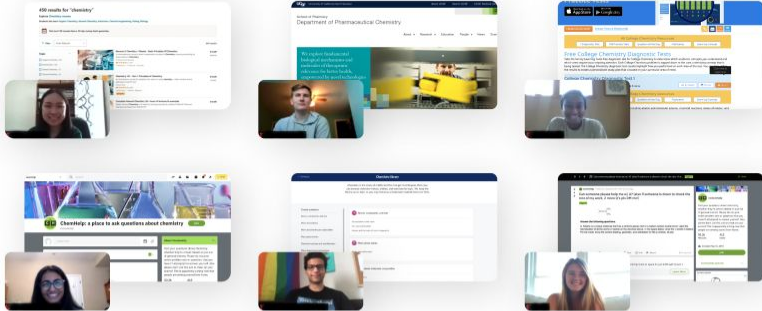
Sarah Grant asked a question. 🙋

There is a c=O bond, but that's all I seem sure about. Can anyone help me find what molecule this is for and give the important peaks please?

- Ryan Johnson, Instructor
- Sarah Grant
- Daniel Peterson
- Alex Pagan

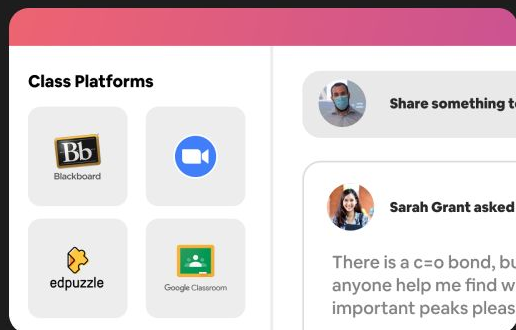
Home **Meeting** Classwork Feed Grades

## Class Meeting: 4/27/2021



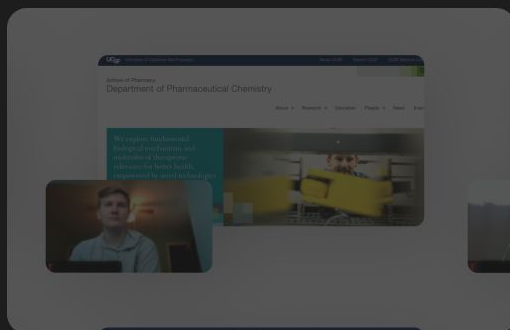
Mute Video Screen More End

# Features for LMS Concept



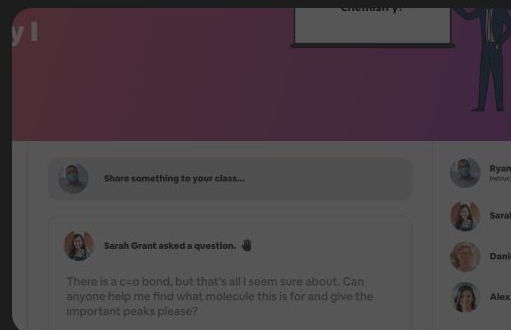
## Multi Platform Support

- Toolbox of individual apps & software that can be opened inside of LMS (reducing tabs)
- Transfer grading & feedback into the schools current LMS (reduce the amount of work)
- New linked calendar for organizing, sorting, and submitting files and content.



## Video Conferencing + Academic Integrity

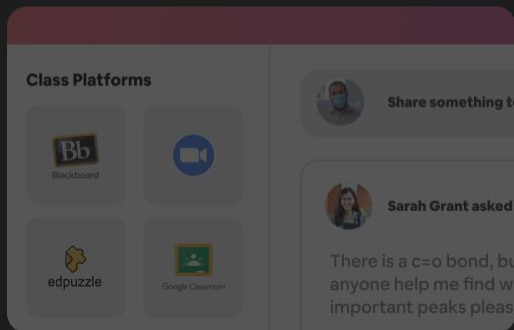
- Multiple screen sharing at one time, and allow teachers to view online students screens at any time
- Available screen sharing at all time to only the instructor for the opportunity for feedback and monitoring
- Proctored tests and quizzes (screen and video recording) to keep academic integrity



## Class Feed

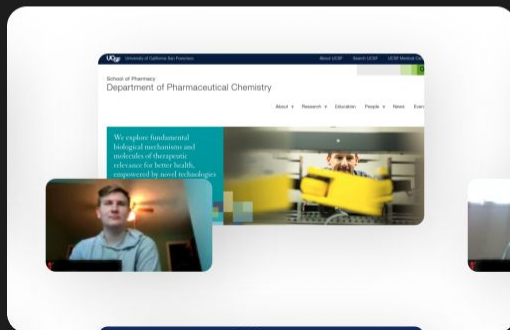
- Social Media build feed inside of LMS to encourage posting the process and progress of work
- Individual student profiles that have previous posts from the feed

# Features for LMS Concept



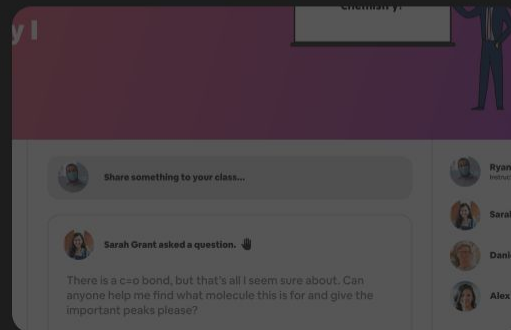
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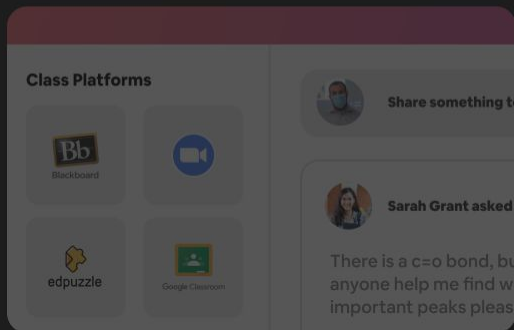
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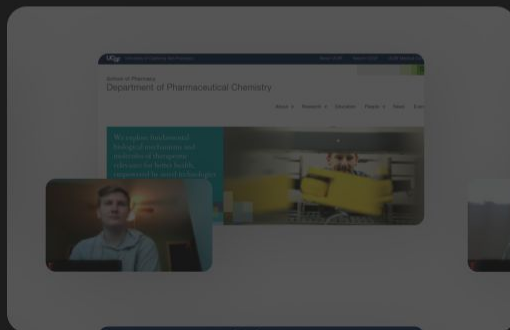
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# Features for LMS Concept



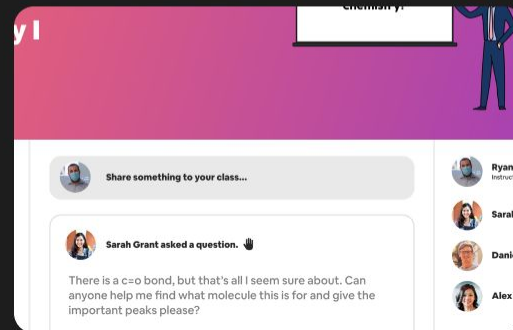
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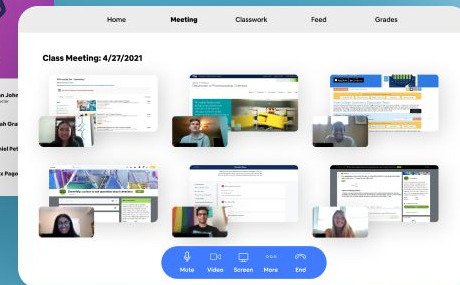
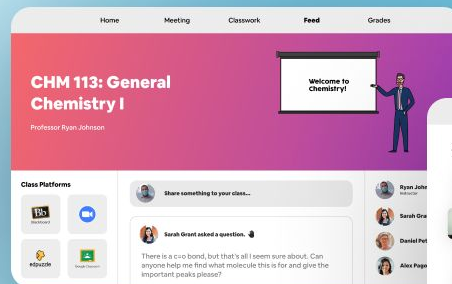


## Class Feed

- Social Media build feed inside of LMS to encourage posting the process and progress of work
- Individual student profiles that have previous posts from the feed

# How does our concept tie in with our insights?

---



## **HMW provide a way for institutions to allow teachers to freely choose their own platforms for their classes while keeping them integrated within the school's learning system?**

---

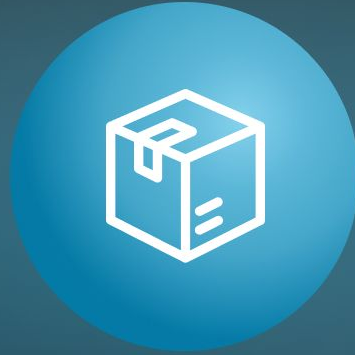
- While the learning management system offers everything instructors and students would need, it would also be designed to integrate into existing systems such as Google Drive, Dropbox, Zoom, etc.
- The LMS would incorporate a calendar and dashboard feature that prevents students from needing to hunt through multiple platforms to find their handouts, quizzes, etc. The platform could integrate with individual files ex. Google docs file can be directly uploaded.



## **HMW create a hybrid learning environment with stronger academic integrity by utilizing screen sharing, so teachers don't have to assign more work to students to make up for the lack of exams?**

---

- The LMS would not invade students' privacy, but would allow for students to share their screens in the background while they are still working.
- The students have the option to share their screen with only the instructor so the instructor can inspect their work in progress. This promotes academic integrity and rebuilds trust in a hybrid learning environment.



**Product Concept**



#### Questions

**Sarah Grant**  
raised her hand

"I'm confused on the last part of the equation, could you go back and explain that again?"

**Daniel Pettis**

#### Poll Results

What is the final answer for #5 equation? Please round your numbers to the hundredths place.

18 Responses

**72%**  
CORRECT

**28%**  
INCORRECT

#### Class Chat

**Ben Quast**  
I've seen the rights confused on what the required factors when you're dividing with decimals

**Daniel Pett**  
10:23 AM

# Features for Product Concept

---



## Student Desktop Device

- 2x6 touchable screen interface with camera and mic built-in
- Displays online students video, class chat, teacher questions
- Automatically records and inputs attendance for teachers by having in person students log into a device



## Teacher Hub

- Holds detachable tablet along with autotracking camera that follows teachers movements and projects video to online students
- Tablet in hub would display both online and in person students questions and poll results
- Light signaling a question allows teacher to leave the hub



## Tablet

- 12x8 tablet that is Detachable from hub
- Teachers can use tablet to write & sketch feedback that could be airdropped to individual student device or online students
- Display order of students who have raised their hand or have a question

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# How does our concept tie in with our insights?

---



## **HMW create an effective hybrid learning environment where both in-person and online students can equally contribute and get acknowledged?**

---

- Provides direct interaction between in person and online students without needing in person students to have a laptop open on their desk.
- Hub allows for teacher to walk around and interact with the classroom, so online students are not forgotten or staring at a blank camera.
- Individual microphones allow for online students to hear in person students better.



**HMW enable teachers to provide quicker feedback to prevent the delay in teacher intervention in student understanding, so it does not take longer for students to grasp concepts; circumventing a more severe divide between students that understand material and those that do not.**

---

- Teacher can request to see online students' screens without the student needing to share their screen with the entire class.
- Students can share individual windows with their teacher without needing to stop working.
- Simple quizzes at the end of class will let the teacher know where students stand with the topic.

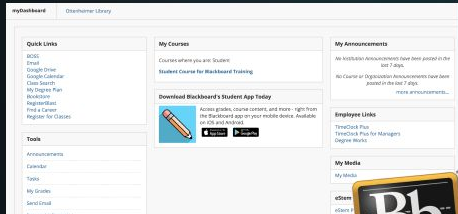
## **HMW promote more balanced levels of communication and feedback in class for both online and in person students by streamlining the experience of preparing and organizing content to effectively instruct both online and in person students**

---

- The 'airdrop' feature would allow for quick and efficient file sharing to both in person and online students.
- With the individual screen share, online students can receive faster feedback, and are no longer at such a disadvantage to in person students.
- Students can also quickly share documents with each other, allowing for a more collaborative environment.

# Learning Management Systems

## Blackboard



Blackboard

Features custom open architecture for institutions to freely customize the layout within its course management

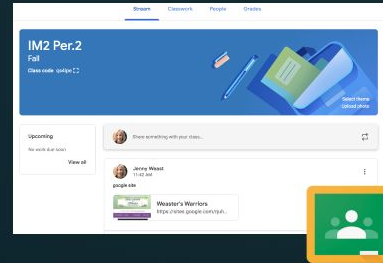
## Canvas



CANVAS

Features two different versions, one for students, and another for teachers, to provide the best interface for each

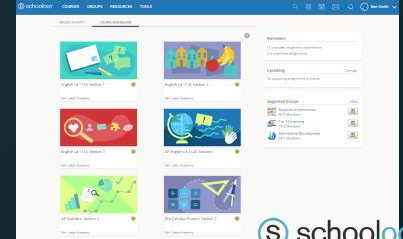
## Google Classroom



Google Classroom

Easily integrates with other Google platforms making it an easy multi-functional platform with a single unified interface

## Schoology



Schoology

Focuses on K-12 schools, with simplified interface design to accommodate for its target users

# Competitive Analysis of LMS

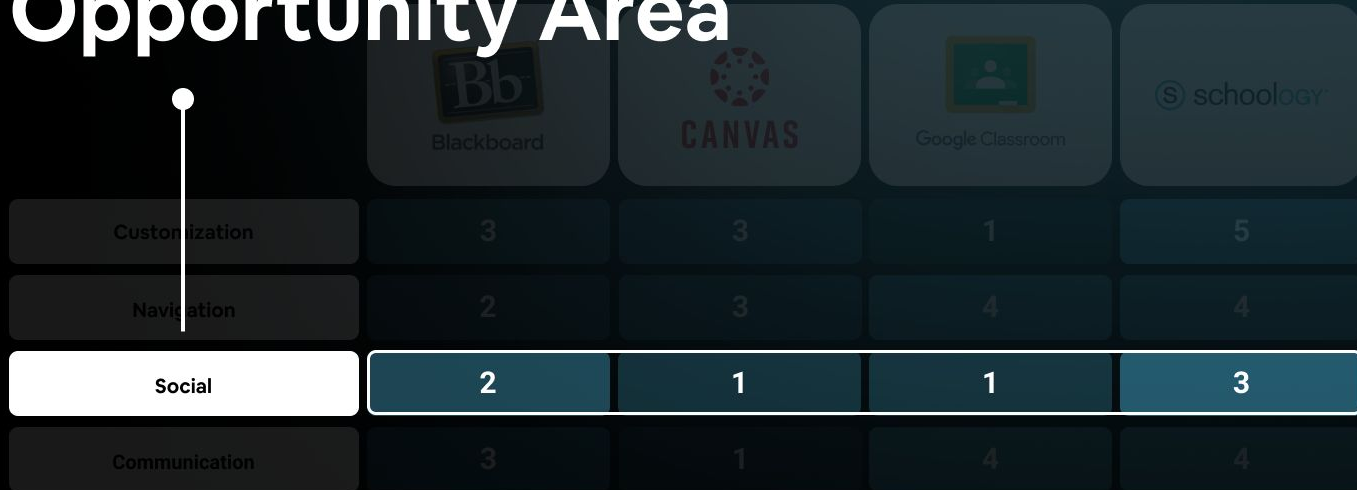
	 Blackboard	 CANVAS	 Google Classroom	
Customization	3	3	1	5
Navigation	2	3	4	4
Social	2	1	1	3
Communication	3	1	4	4

1: Poor

3: Acceptable

5: Excellent

# Opportunity Area



	Blackboard	CANVAS	Google Classroom	schoolology
Customization	3	3	1	5
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# Hybrid Learning Products

## AVerVision Visualizer



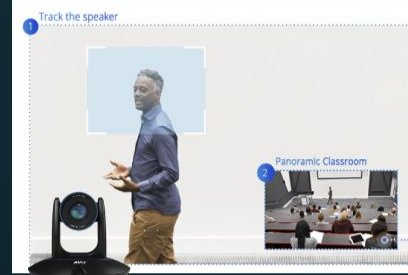
Provides an easy way for teachers who would like to show detailed projections of physical objects for online students to see

## AVer Control Boxes



Integrates input from multiple devices, such as multiple computers and tablets onto a single layout display which could be adjusted accordingly

## AVer Tracking Cameras







Cameras which automatically track the position of the speaker, allowing them to walk around freely without worrying of going out of frame

## SMART Board 6000S



Display that also allows the presenter to freely write on the board, as it gets digitized in real time for online students to see

# Competitive Analysis of Products





				
Cost	5	3	4	1
Integration	5	4	5	3
Social	2	3	4	3
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# Opportunity Area

				
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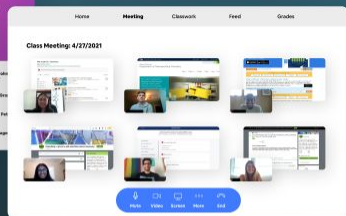
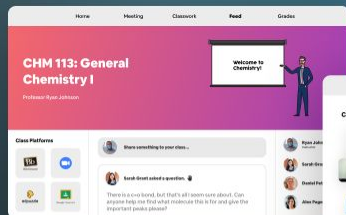


**05.**

**Preliminary Concepts**



# LMS



# Product





Moving forward **the concept we  
will focus on...**

## Selected Product Concept

After group deliberation, we decided to continue to develop, user test, and ideate for our physical product concept moving forward.



# Why did we select our product concept?

Based on our feedback and research insights, we concluded our physical product ecosystem would have more of an impact on the teacher experience of hybrid learning by increasing collaboration and facilitating feedback within the classroom.

Additionally, we plan to combine essential features from our preliminary LMS concept to create a more inclusive and robust classroom conferencing platform.



# Concept Validation Plan

**12**

Hybrid Teachers

## Open Card Sorting

Help understand the terminology, and how users would create relationships and divide them into different categories

**10**

Hybrid Teachers

## Interviews

To gain further insight on what aspects our target audience feels about the initial concepts.

# Open Card Sorting

We asked participants to cluster labels (cards) for existing content into their own categories and then label those categories.

Getting notifications whenever a student wants to ask a question (mostly used when teachers are occupied helping the in-person students)

Each student gets their own page where I can see previous feedbacks, comments, and histories.

Being able to reply to a specific chat message

Class feed where students post their work in progress, questions, etc. (Works like social media with likes, comments, pin)

Teachers can select specific students to view their screen

Using the 360 degree camera to see the entire classroom

Being able to edit recorded lectures on the same platform

Creating sketches, documents, and being able to remote control in the

13 of 13 remaining

## Step 1

Take a quick look at the list of items to the left.

We'd like you to sort them into groups that make sense to you.

There is no right or wrong answer. Just do what comes naturally.

## Step 2

Drag an item from the left into this area to create your first group.

# Card Sorting Insights

## Tasks

---

- Communication
- Monitoring
- Feedback
- Recordings

## Descriptions

---

- Convenience
- Efficiency
- Help
- Communication



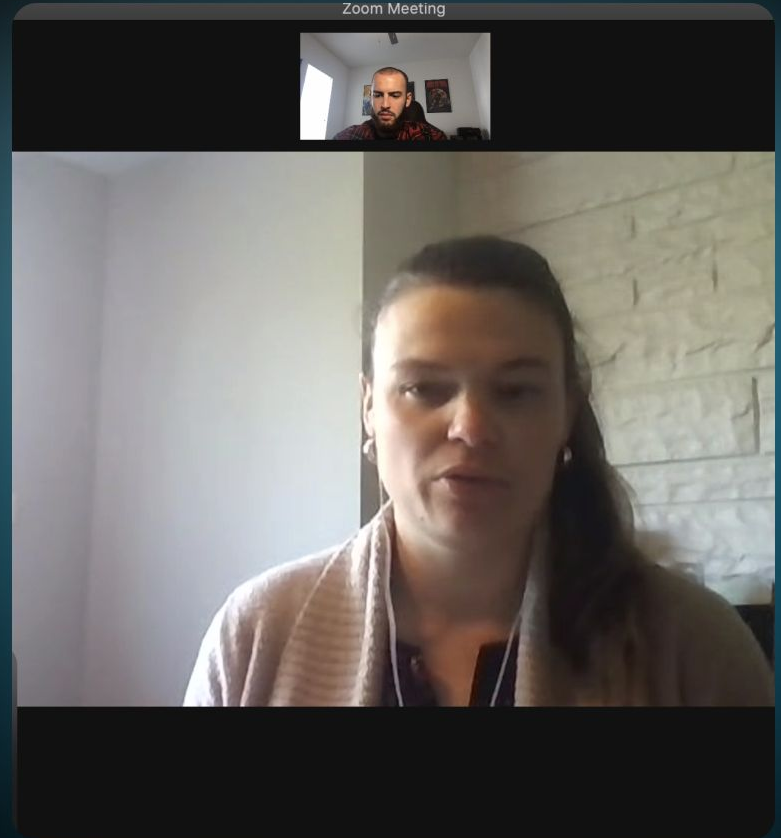
# Interviews

## We asked hybrid teachers...

What is your overall impression of our concept? What stood out to you the most?

If this product was in the range of \$800-\$1000 dollars do you think your school would invest in this product for hybrid learning?

Would this incentivize you to use a tablet with the hub device, due to being able to sketch/write feedback for students as you walk around the room?



# Interview Insights

## Positives +

---

- Really intuitive and easy to use
- Being able to see how long student's watched recorded lectures and check students' screens for tests or quizzes would be so helpful
- I thought it was really interesting and I'd definitely keep an eye on something like it if it ends up being an actual product
- Being able to see multiple students screens at once and having the whole room shown with one camera

## Negatives -

---

- Pricey when some features are unnecessary for some classes
- "I'm not very sure, I'd really like it and if the school thinks it's a good investment then they might consider it, but it could be too expensive"
- "I can see how it would be useful, but since I teach programming, it might not apply to me as much since a lot of my classes are based off typing out code and that might be hard on a tablet"

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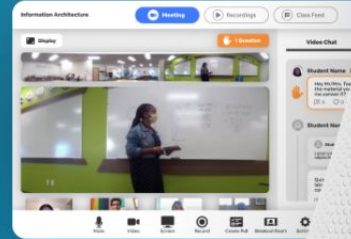
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**06.**

**Product and Software**

# SPARK

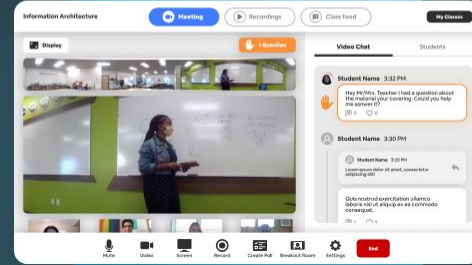
A hybrid learning product with a 360 degree camera, mic, and speaker integrated with a video conferencing platform, that facilitates a more intuitive and collaborative learning environment.





## PRODUCT

Product hub with a 360 degree camera, mic, and speaker that would be placed in middle or front of a classroom.



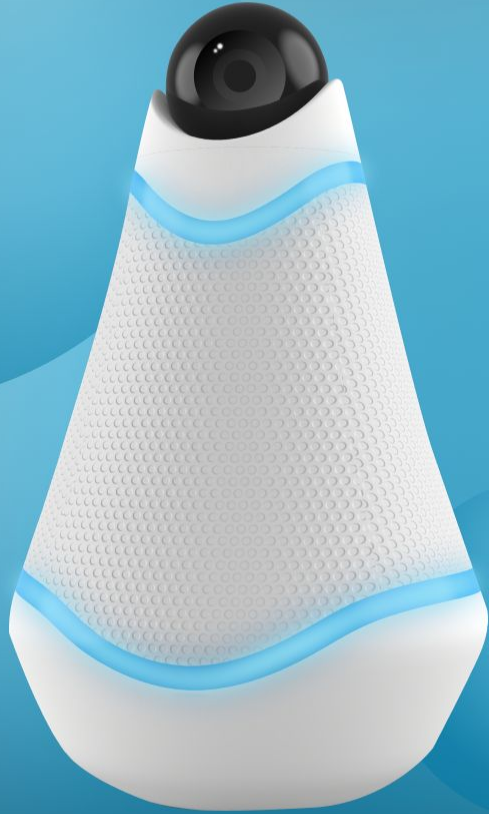
## SOFTWARE

Video conferencing platform that works in tandem with product hub and student device.



# SPARK

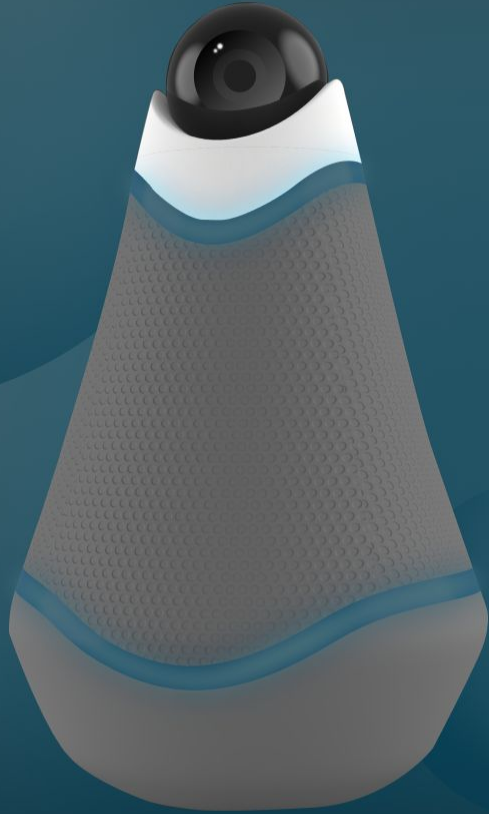
PRODUCTS



## **SPARK HUB**

The teacher hub is a stationary docking station that alerts and facilitates interaction between online students and in-person teachers through a 360 degree auto-tracking camera, audio input, light, and remote.

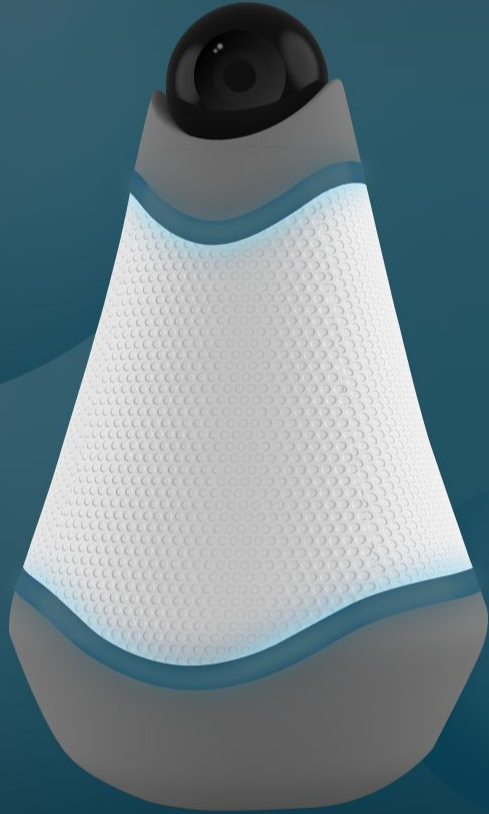




# SPARK HUB

## 360 CAMERA

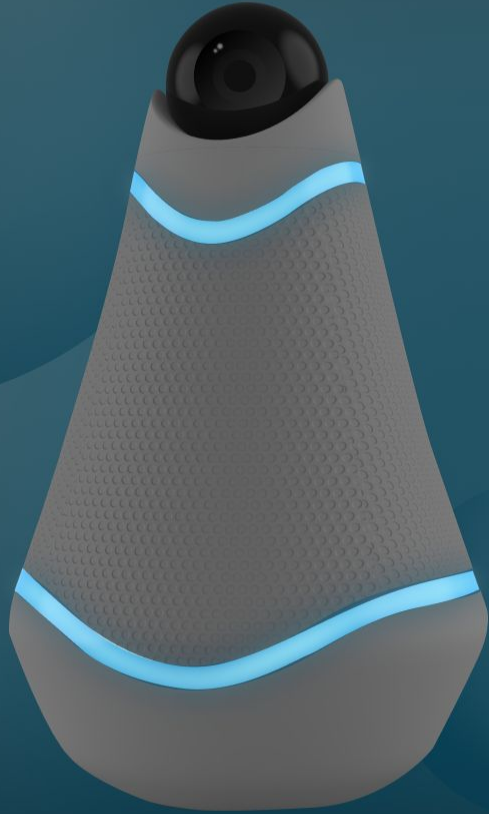
The 360 camera facilitates a natural learning environment by allowing teachers to interact with in-person students while not needing to remember to watch for questions and comments from online students.



# SPARK HUB

## AUDIO + SPEAKERS

The hub will have speakers and a microphone so the teacher can interact with online students when the tablet is docked. The audio will be separate from their computer and the students' audio to mitigate feedback and audio issues.



# SPARK HUB

## RING LIGHT

The optional light at the bottom of the hub serves to alert the teacher while they are away from their desk and hub so they can promptly acknowledge online students needing assistance.



# SPARK HUB

## TABLET

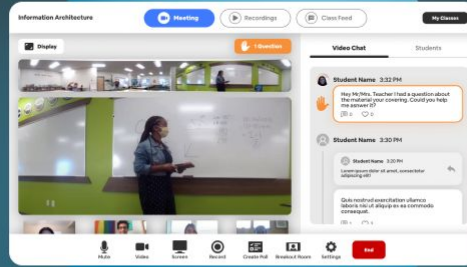
The teacher tablet docks into the stationary hub when the teacher is not actively moving in order to promote a seamless transition between their desk and navigating the classroom.



# SPARK HUB

## REMOTE

The hub features an integrated remote that allows for easy interaction between online students and the teacher without requiring the teacher to carry the detachable tablet. The remote features a microphone for quick feedback and can control the audio and video settings, as well as basic functions of the video conference.



# SPARK

SOFTWARE



**Pair the Spark Hub to  
bluetooth.**

Connect 



**Pairing Hub...**

Connecting 




**Spark Hub Paired!**


Next

**ONBOARDING**  
BLUETOOTH




## Connect Hub to Wifi

School Wifi 

Phone Hotspot 



## Connect Hub to Wifi

School Wifi 

Next

ONBOARDING  
WIFI



# SPARK

## My Classes:

**Information  
Architecture**

8:00 AM - 9:00 AM

Meeting ID: 779 1291 71899

Start Class

**Graphic Design  
Media Management**

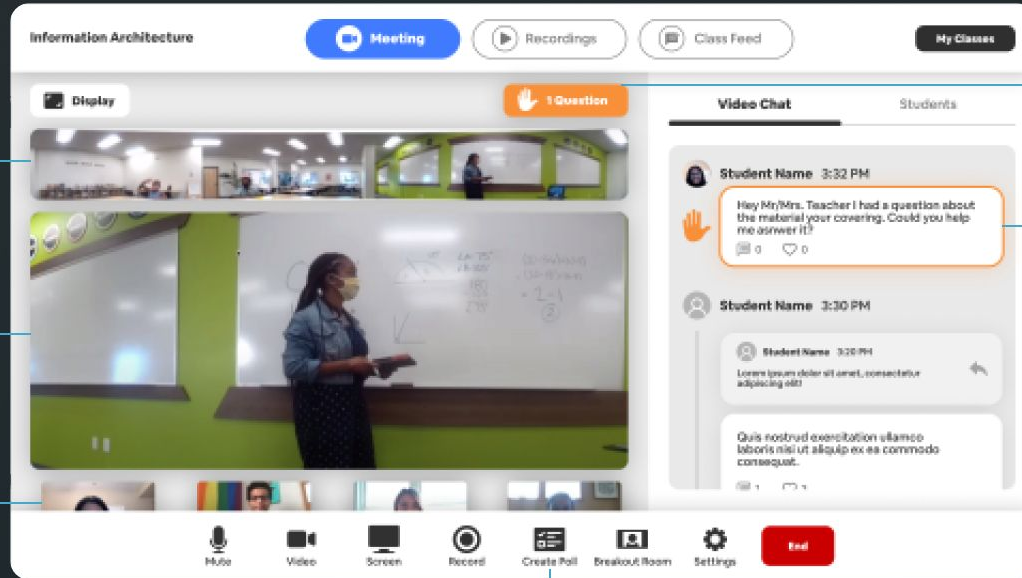
11:00 AM - 1:00 PM

Meeting ID: 978 9211 99817

Start Class

**ONBOARDING  
CLASSES**

# MEETING PAGE



360 Degree Camera

Tracking Video

Student Video

Easy to see student questions

Create Poll

# MEETING PAGE DISPLAY

Choose what video is  
displayed on the UI

Change camera  
display on UI

The screenshot shows a meeting interface with a 'Display' modal open. The modal is titled 'Display' and has a close button (X) in the top right corner. It is divided into three sections: 'Spark Devices', 'Computer', and 'Arrangement'.

- Spark Devices:** Contains three items: 'Tracking Camera' with a checked checkbox, '360 Camera' with a checked checkbox, and 'Student Device' with an unchecked checkbox.
- Computer:** Contains three items: 'Teacher Webcam' with an unchecked checkbox, 'Student's Screen' with an unchecked checkbox, and 'Student Video' with a checked checkbox.
- Arrangement:** Contains two large gray rectangular buttons. The top button is labeled '360 Camera' and the bottom button is labeled 'Tracking Camera'.

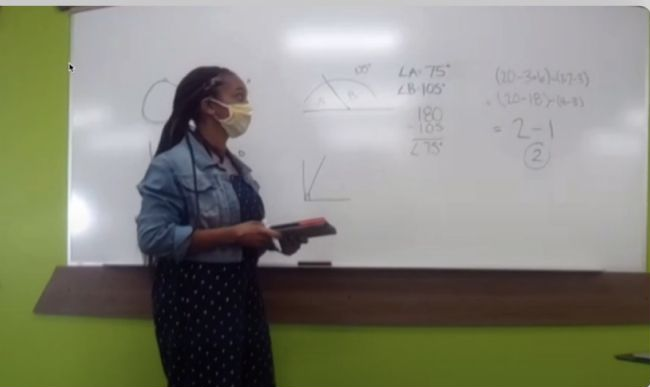
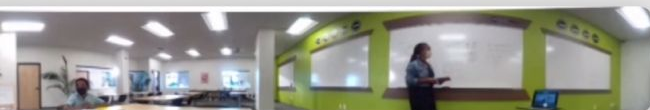
The background of the meeting page shows a 'Meeting' button, 'Recordings' and 'Class Feed' buttons, and a 'Video Chat' sidebar with student profiles and chat messages. At the bottom, there is a toolbar with icons for Mute, Video, Screen, Record, Create Poll, Breakout Room, Settings, and a red 'End' button.

Meeting

Recordings

Class Feed

My Classes



Firstname Lastname



**Chemistry library**

Chemistry is the study of matter and the changes it undergoes. Here you can browse chemistry videos, articles, and exercises by topic. We keep the library up-to-date, so you may find new or improved material here over time.

**Atoms, compounds, and ions**

Introduction to the atom  
Ions and compounds  
Names and formulae of some compounds

**More about atoms**

Models and nuclear mass  
Isotopes

**More about molecular composition**

Pure substances

Unmute Student

Turn Off Video

**View Screen**

Send Message

Breakout Room

# MEETING PAGE

## STUDENT SCREENS

Teachers can view student screens without being shared

Mute

Video

Screen

Record

Create Poll

Breakout Room

Settings

End

# RECORDINGS

Information Architecture

Meeting Recordings Class Feed My Classes

- Unit 10
- Unit 9
- Unit 8
- Unit 7
- Unit 6
- Unit 5
- Unit 4
- Unit 3
- Unit 2

**Recorded Lecture**  
6/21/2021  
Unit 10  
Lorem ipsum dolor sit amet, consectetur adipiscing elit, sed do eiusmod tempor incididunt ut labore et dolore magna aliqua. Ut enim ad minim veniam, quis nostrud exercitation ullamco laboris nisi ut aliquip ex ea commodo consequat.

**Demo**  
6/18/2021  
Unit 10  
Lorem ipsum dolor sit amet, consectetur adipiscing elit, sed do eiusmod tempor incididunt ut labore et dolore magna aliqua. Ut enim ad minim veniam, quis nostrud exercitation ullamco laboris nisi ut aliquip ex ea commodo consequat.

**Demo**  
6/21/2021

Public Edit Analytics

Private Edit Analytics

Instant Record

Organized recorded lectures and demos

Video Visibility

Video Analytics

Upload demos & edited videos

Instant Record

Meeting

Recordings

Class Feed

My Classes

# RECORDINGS ANALYTICS



## Recorded Lecture

6/21/2021

Unit 10

Lorem ipsum dolor sit amet, consectetur adipiscing elit, sed do eiusmod tempor incididunt ut labore et dolore magna aliqua. Ut enim ad minim veniam, quis nostrud exercitation ullamco laboris nisi ut aliquip ex ea commodo consequat.

Public

Edit

Analytics

## Viewers

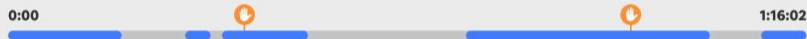


Firstname  
Lastname

Watch time (mins): **47:02**

Questions: **2**

0:00



1:16:02

Student watch time  
of recorded lectures

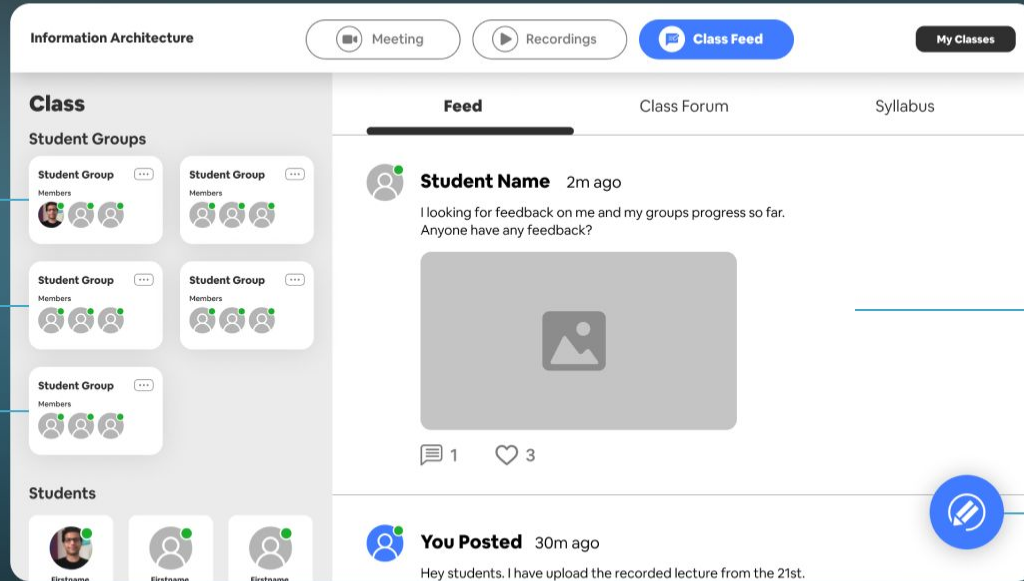


Watch time (mins): **32:48**

Questions: **1**

Student's can post  
questions on  
recorded lectures

# CLASS FEED



Quick access to student groups

Class feed with posts from both students and teachers

Sketch, Write, or Screen share

Meeting

Recordings

Class Feed

My Classes

Create 



To:

Search students or groups



**Sketch**

Draw feedback for students using a tablet.



**Document**

Write out feedback for in a word document.



**Remote Control**

Takeover student screen to explore and sketch feedback.

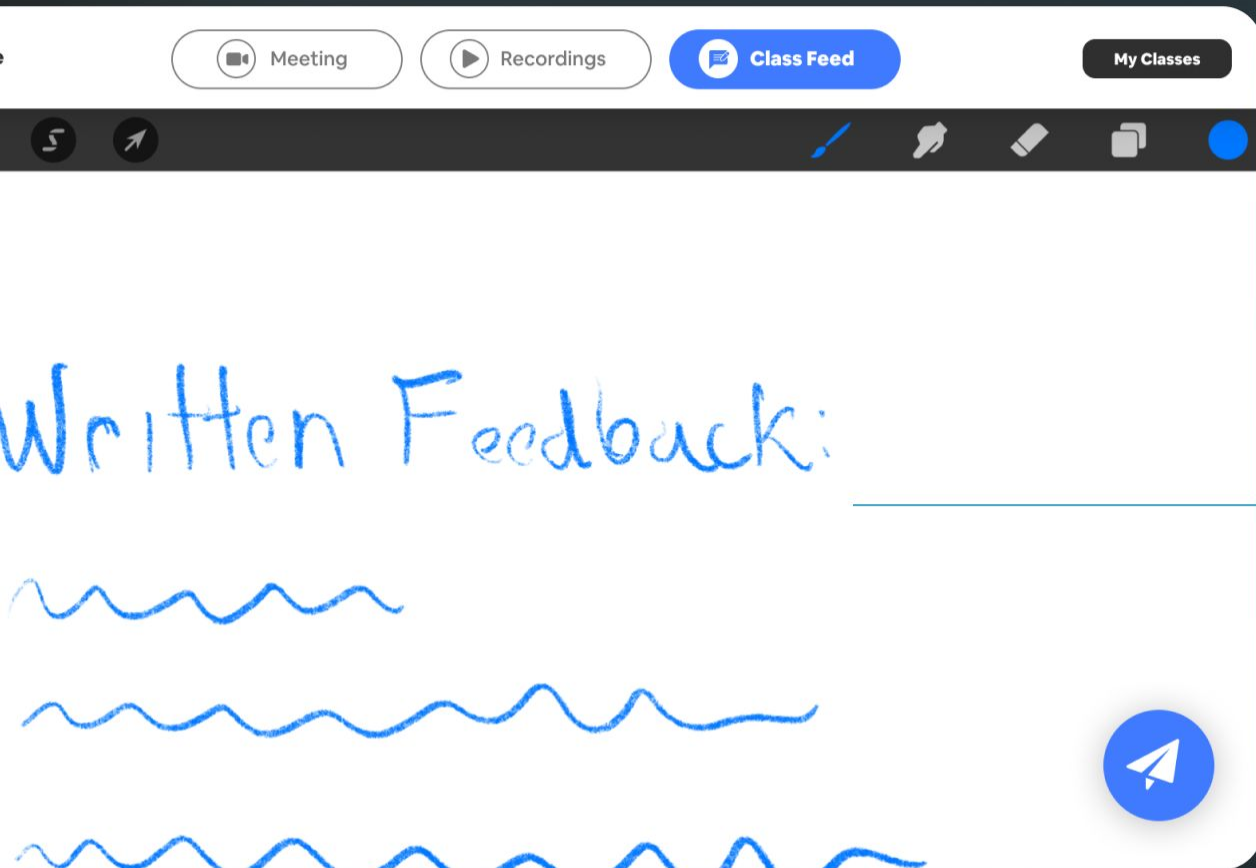
# CLASS FEED

## CREATE

Student Group Members

Sketched, written, or screen shared student feedback





# CLASS FEED

## SKETCH

Sketched feedback  
through tablet

Meeting

Recordings

Class Feed

My Classes

## Sketch



### File Name

Untitled sketch

### To:

Search students or groups



## CLASS FEED SKETCH

Share sketched,  
written, or screen  
shared feedback to  
student forums

Meeting

Recordings

Class Feed

My Classes



## Student Group's Forum



Firstname  
Lastname



Firstname  
Lastname



Firstname  
Lastname



Firstname  
Lastname

### Previous Feedback

### Group Feed

**Unit 10 Feedback**  
Edited 1hr ago

Vous pouvez me contacter au téléphone et aussi. Néanmoins, je préfère que vous m'écrivez vos commentaires. Vous pouvez me contacter au téléphone et aussi. Néanmoins, je préfère que vous m'écrivez vos commentaires. Vous pouvez me contacter au téléphone et aussi. Néanmoins, je préfère que vous m'écrivez vos commentaires.

Vous pouvez me contacter au téléphone et aussi. Néanmoins, je préfère que vous m'écrivez vos commentaires. Vous pouvez me contacter au téléphone et aussi. Néanmoins, je préfère que vous m'écrivez vos commentaires.

Comme ça, je préfère que vous m'écrivez vos commentaires. Vous pouvez me contacter au téléphone et aussi. Néanmoins, je préfère que vous m'écrivez vos commentaires. Vous pouvez me contacter au téléphone et aussi. Néanmoins, je préfère que vous m'écrivez vos commentaires.

Merci de m'avoir écrit vos commentaires. Vous pouvez me contacter au téléphone et aussi. Néanmoins, je préfère que vous m'écrivez vos commentaires. Vous pouvez me contacter au téléphone et aussi. Néanmoins, je préfère que vous m'écrivez vos commentaires.

**Project 5 Feedback**  
Edited 1 week ago

**Unit 9 Feedback**  
Edited 2 weeks ago

# CLASS FEED FORUMS

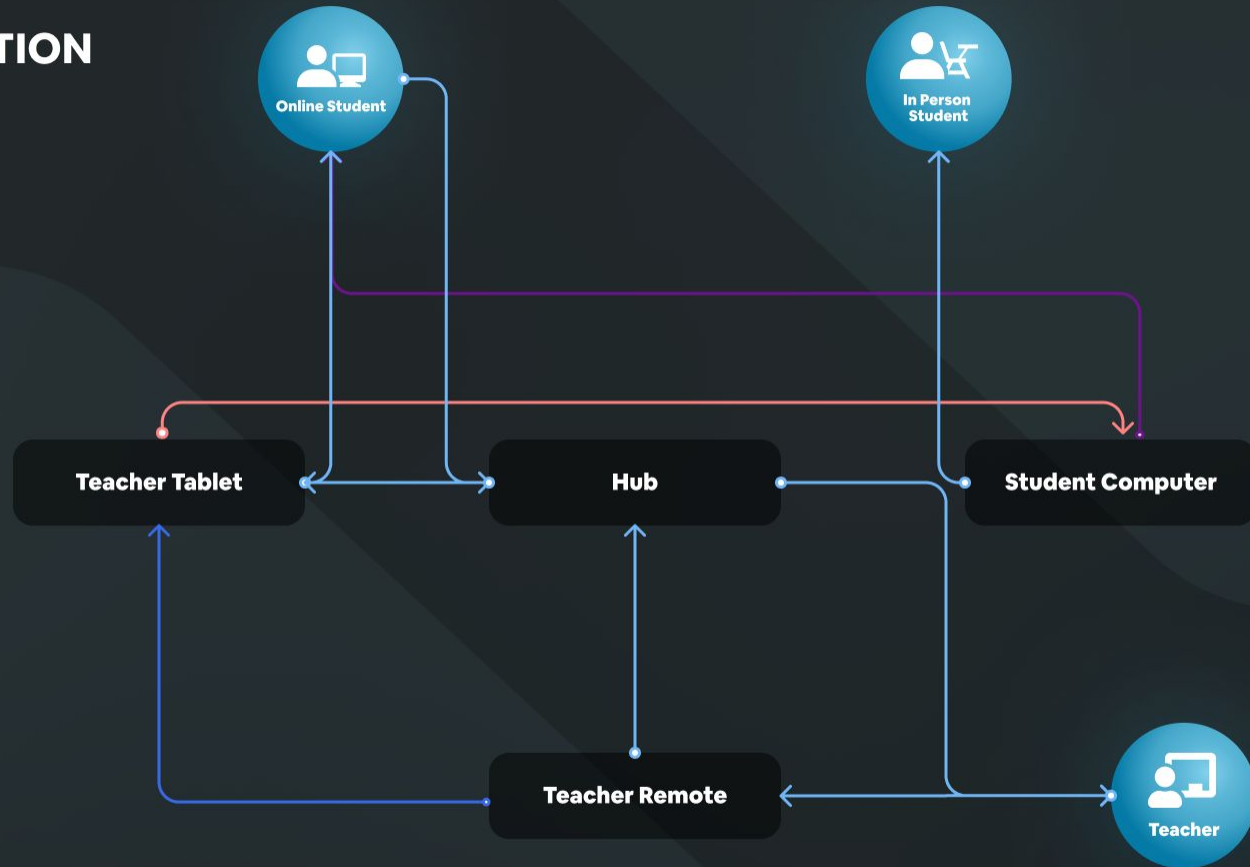
Student Group Members

Students and Teachers can view previous feedback in forum at anytime

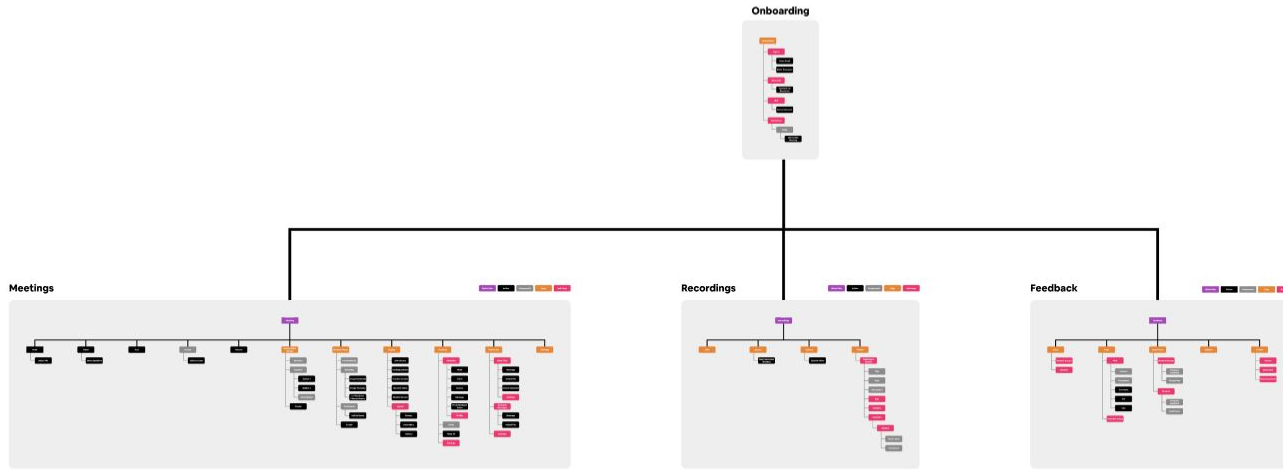
**07.**

**Initial Interaction Model & Sitemap**

# INTERACTION MODEL



# SITEMAP SOFTWARE



## Organization Scheme

Has a generally flat **exact organization a task-oriented** scheme.

## Organization Structure

**Broad and shallow hierarchical structure** where almost every action is presented to the user at once.

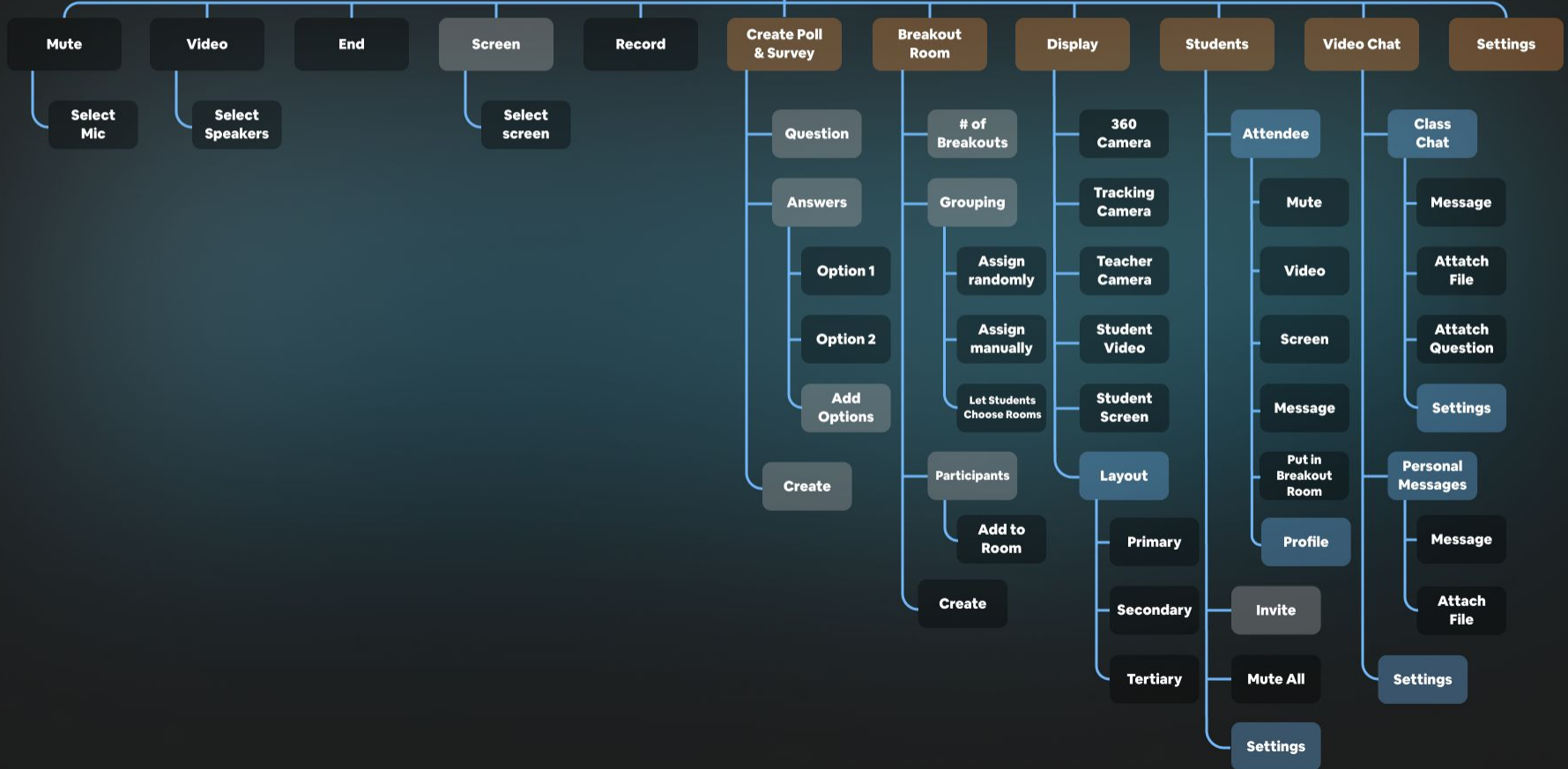
# Meeting

Action

Components

Page

Sub-page



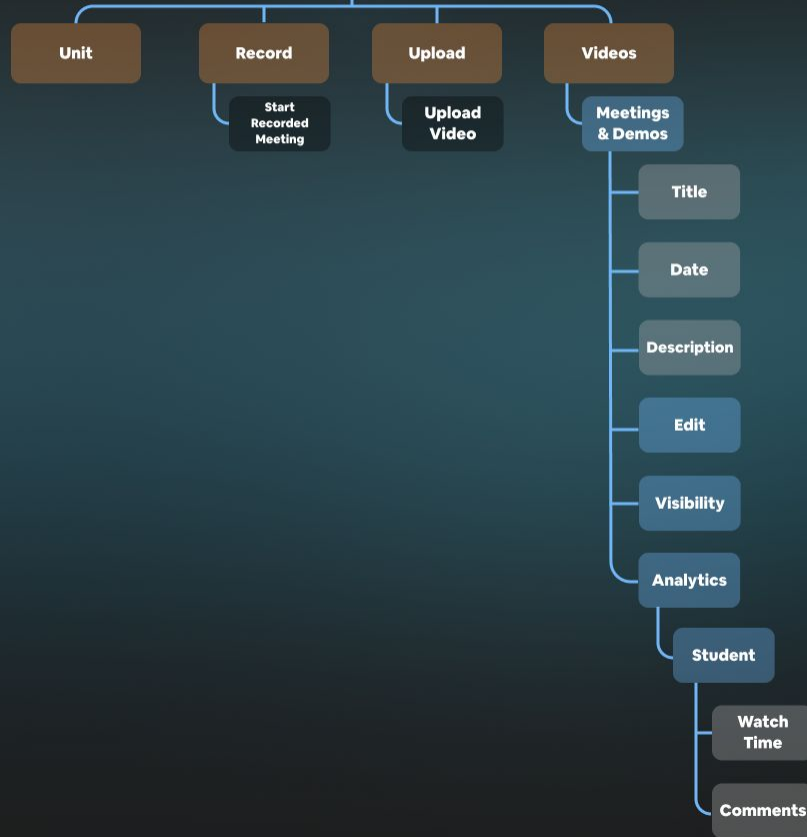
# Recordings

Action

Components

Page

Sub-page





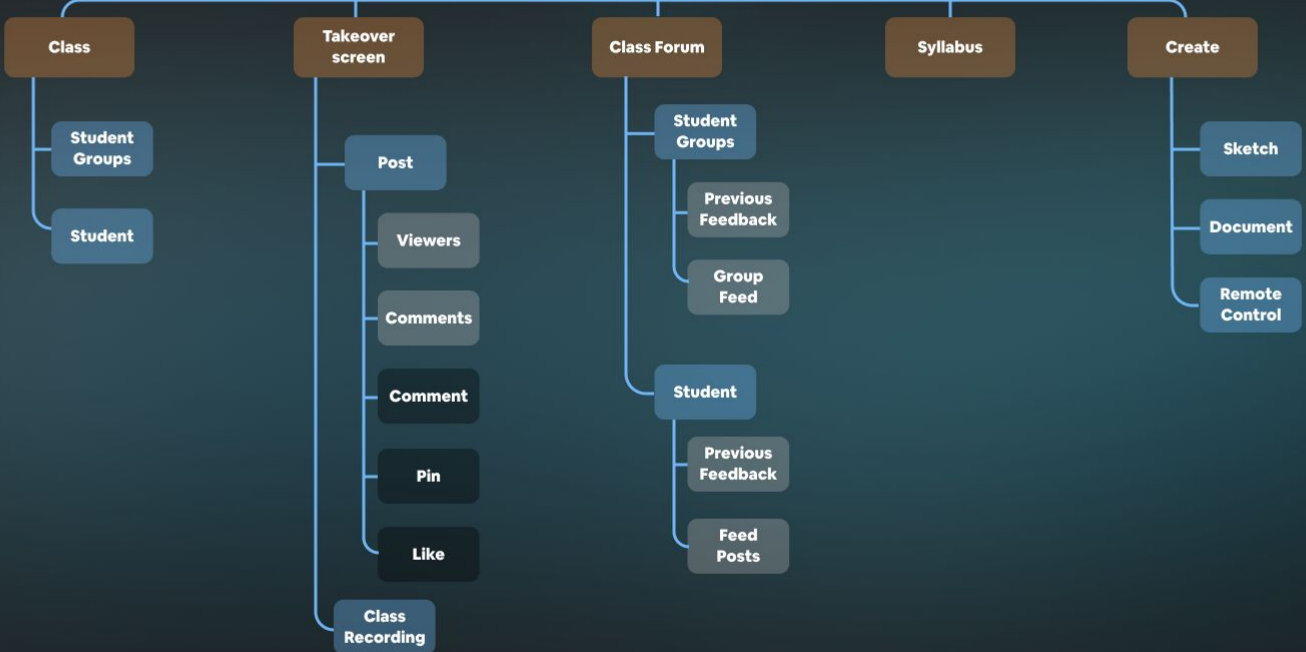
# Feedback

Action

Components

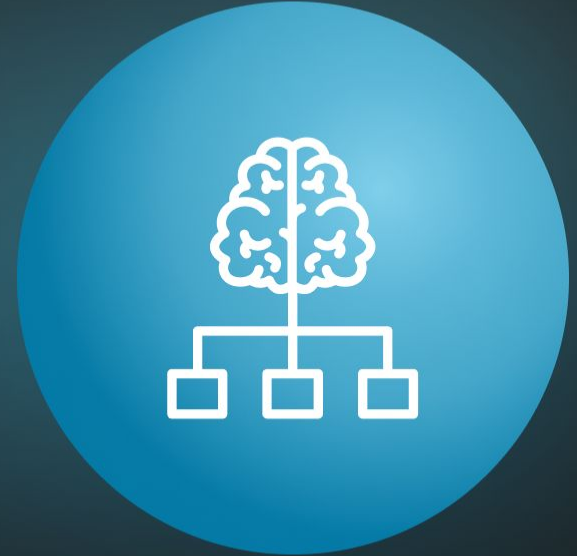
Page

Sub-page

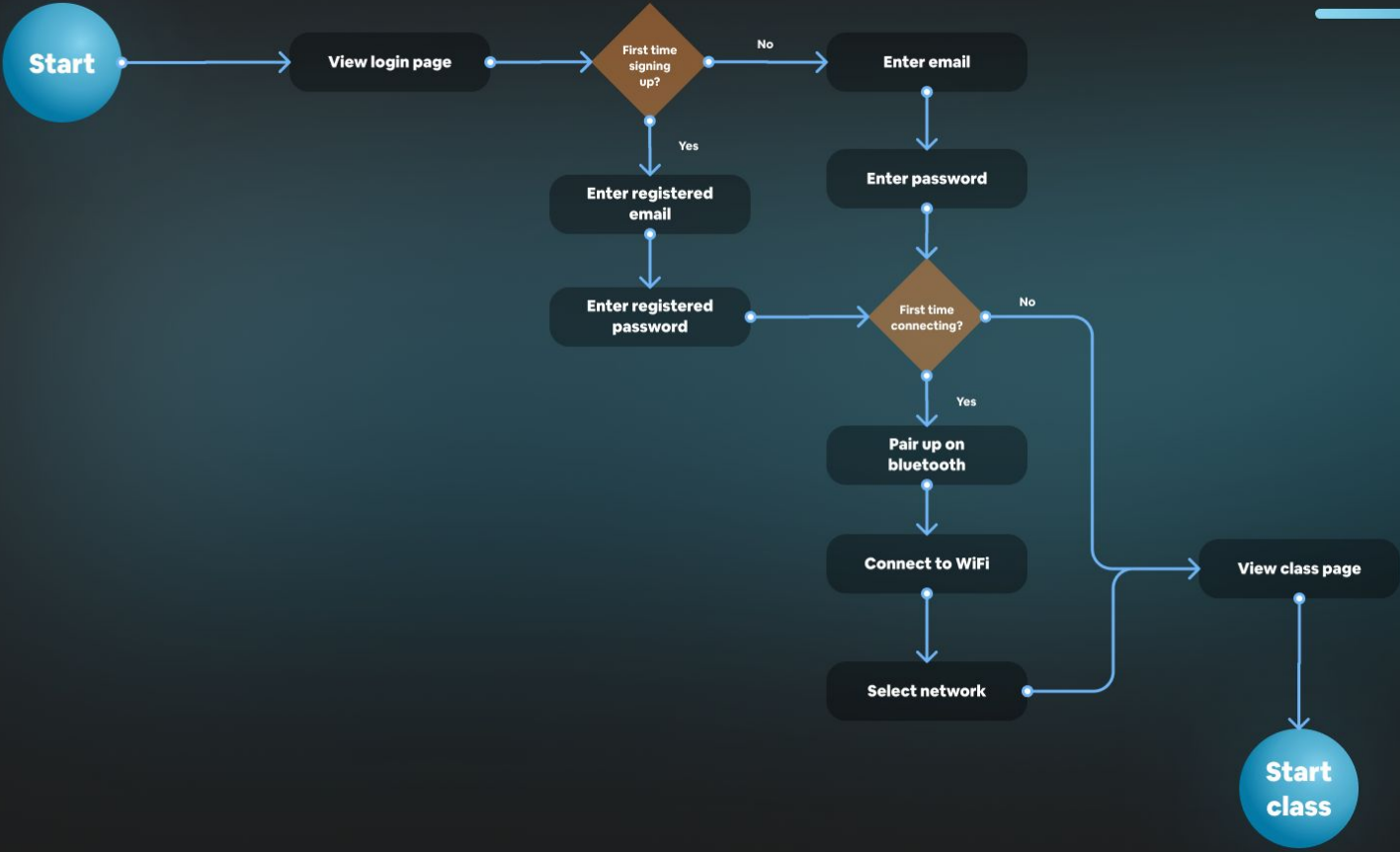


# TASKFLOWS

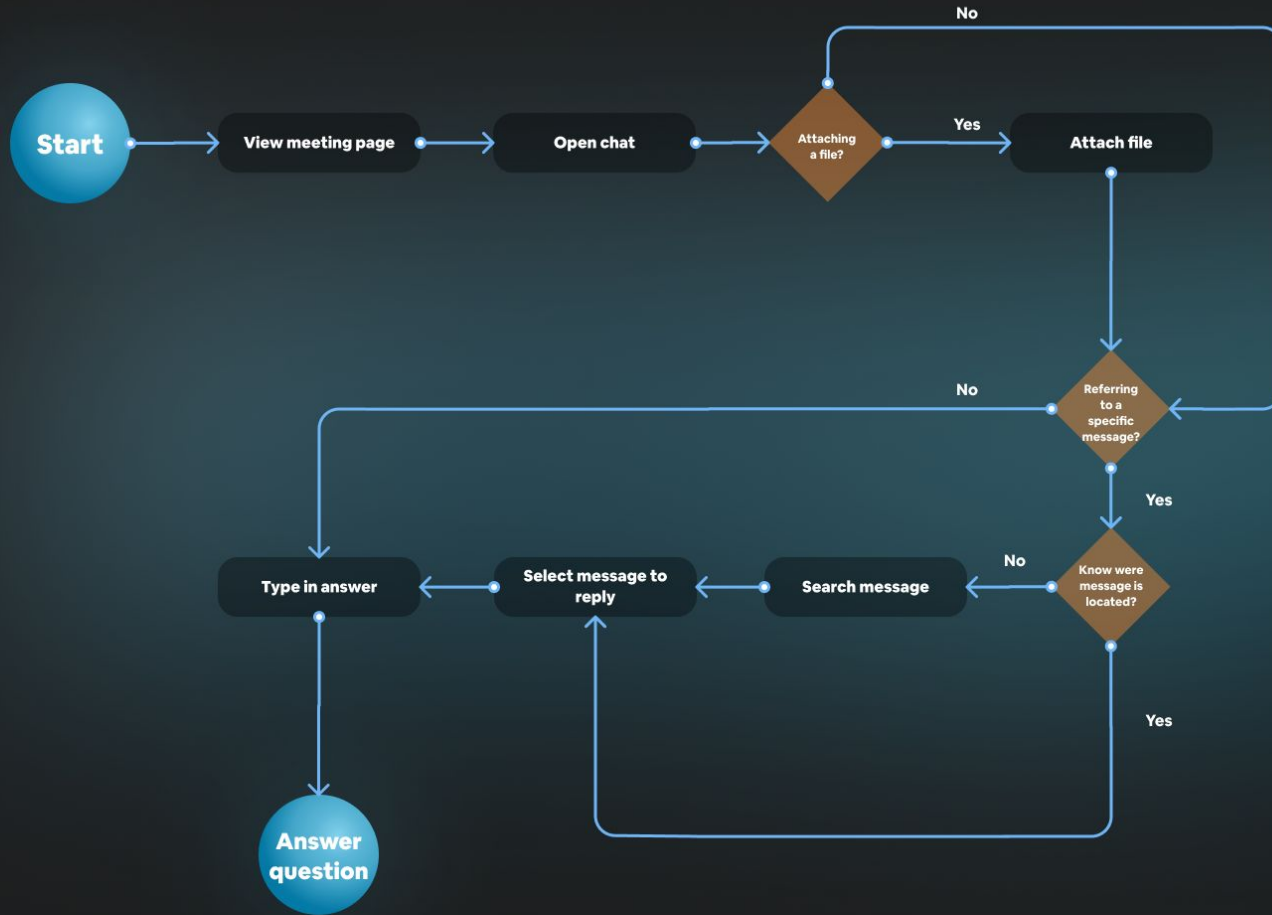
1. Starting a Class
2. Answering Questions
3. Giving Student Feedback



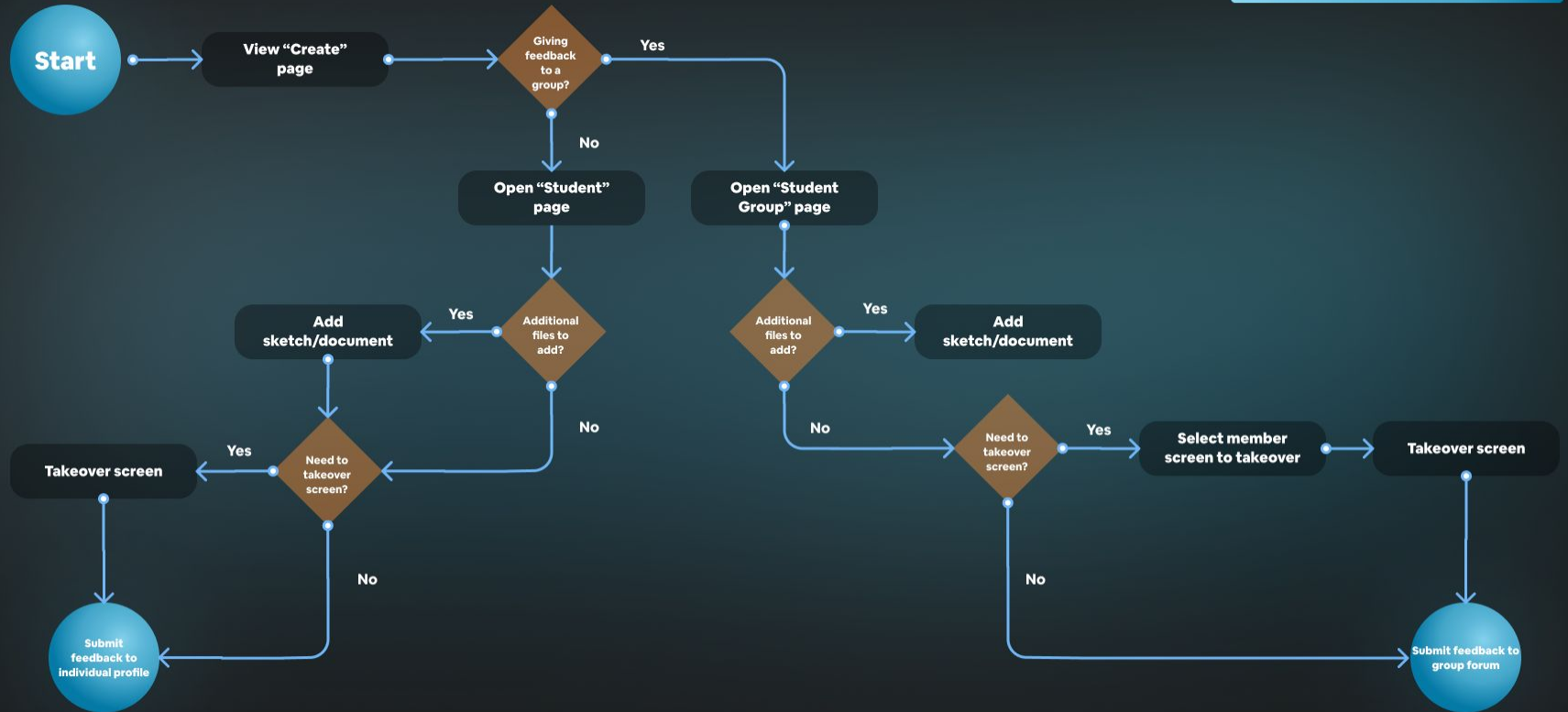
Starting a class



# Answering questions



## Giving student feedback



**08.**

**User Testing**

# User Testing Plan

**6**

Hybrid Teachers

## Tree Test

To check if the users understood the concept and to test the usability of the prototype

**10**

Hybrid Teachers

## Interviews

To gain further insight on what aspects our target audience feels about the initial concepts.

# Product Testing

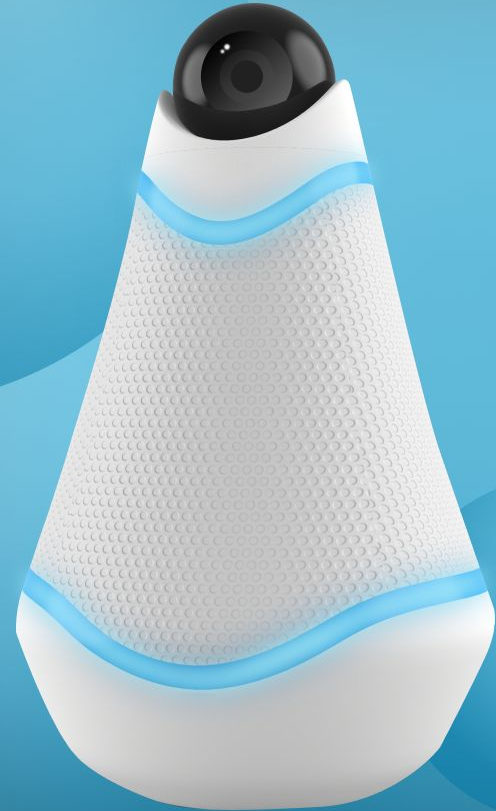
## We asked hybrid teachers...

What product feature do you think would be the most helpful to you and why?

What product feature did you find confusing and why?

Do you think this product will be able to solve the current problems you have with hybrid teaching? If yes, problems and how?

Do you feel like this product would more easily allow you to manage, see, and communicate with both online and in person students at the same time?





# Product Testing Results

## Feedback

---

- The 360 camera and auto tracker is very helpful
- “Yes, I think it would allow me to not waste so much time setting class up and allow me to focus on more important things”
- All of the features here compliment each other nicely and seems to have carefully considered most of the needs in hybrid learning

## Areas of Improvement

---

- Clarification on how the camera works

# Software Testing

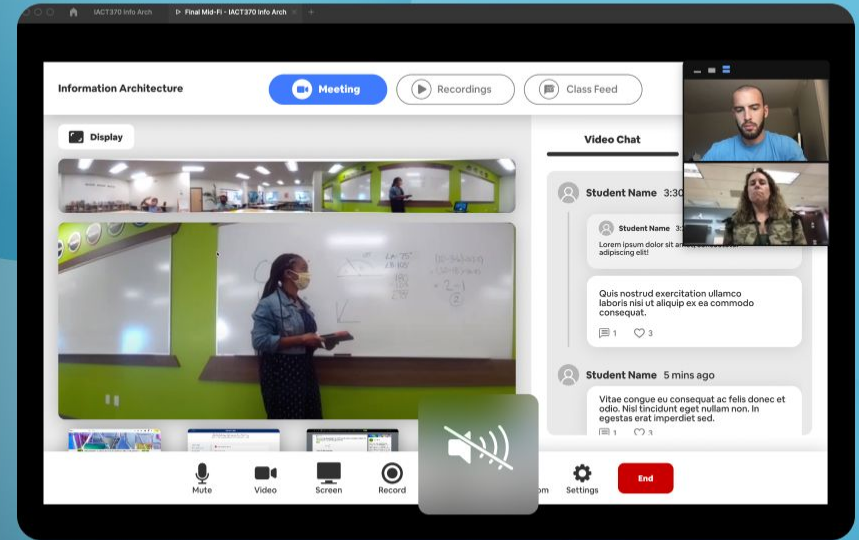
## We asked hybrid teachers...

What software feature do you think would be the most helpful to you and why?

Are there any other features you would like to add to our video conferencing software?

What software feature did you find confusing and why?

Do you think this product will be able to solve the current problems you have with hybrid teaching? If yes, problems and how?



# Software Testing Results

## Feedback

---

- Being able to see students' screens for tests or quizzes would be a game changer
- "Being able to see where students asked questions in the recorded lectures, it would be easy for me to go back and explain what I was talking about at that specific time"
- All felt really intuitive and smooth
- Nothing about the software was confusing to me

## Areas of Improvement

---

- "Finding the groups and the class feed"
- "Was difficult to locate at first or understand what it did"
- Class feed has repeated information

# Tree Test

Participants are presented with goals  
“To find a certain content” and asked to  
navigate using the tree simulation.

## Task 1 of 2

Charlie wants to create sketches so he can visually describe his idea to his classmates. How would he do that?

▼ Home

Meeting

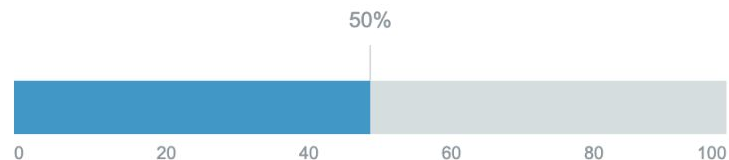
Recordings

Class Feed

## Tree Test Results

- Average time spent was 5 minutes and 9 seconds
- 50% of answers were chosen without backtracking

### Directness



This chart shows the average directness score across all your tasks.

Out of all the tasks completed by participants, 50% of answers were chosen without backtracking.

# Task 1

“Charlie wants to create sketches so he can visually describe his idea to his classmates. How would he do that?”

## RESULTS

3

Direct Success

1

Indirect Success

2

Indirect Failure

- Confusion with navigation and labels
- Clicked on **Student Screen** instead of **Create Sketch**

## Task 2

“For a professor’s Information Architecture class, students who miss a class are required to watch the class recording. Professor wants to make sure his students watch the entire video. How would he do that?”

### RESULTS:

4

Direct Success

1

Indirect Failure

1

Direct Failure

- Confusion with the labels

**09.**

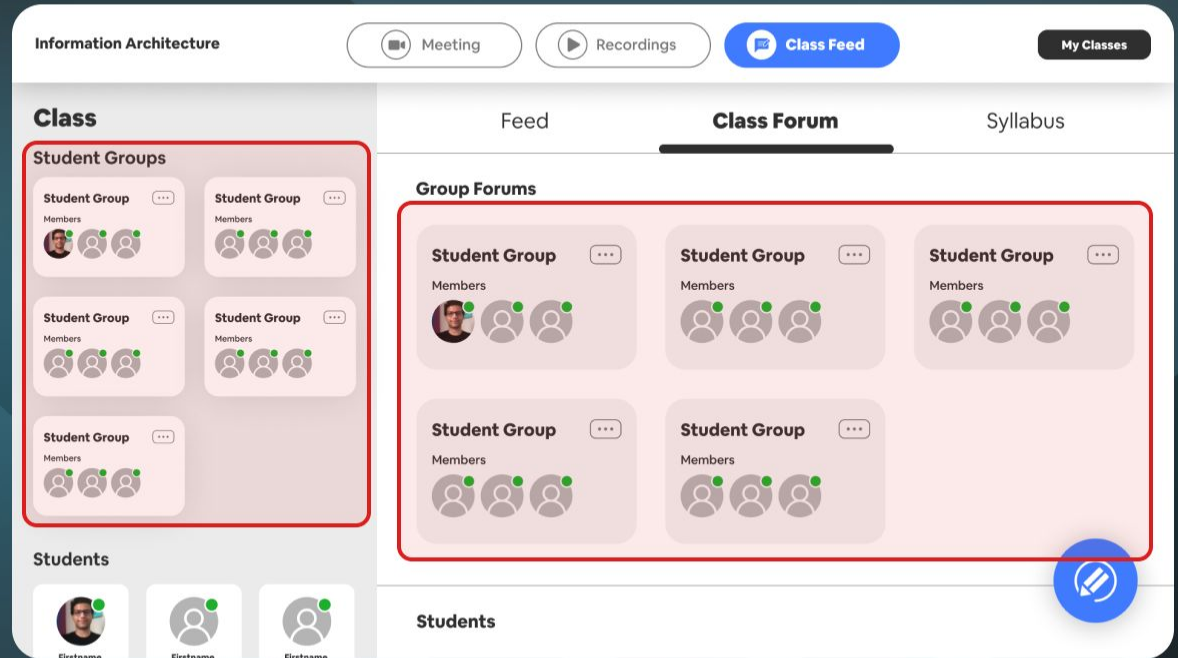
**Improvements**



# CLASS FEED CLASS FORUM



Remove side menu on the left hand side with groups and student, to reduce repeated information.



# MEETING PAGE DISPLAY

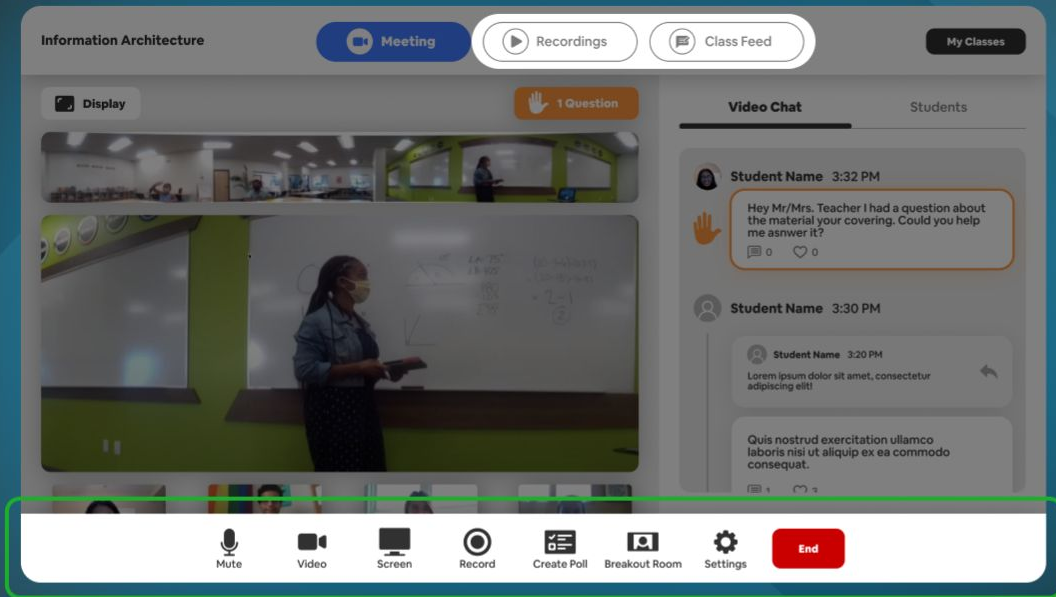


Add an option to choose audio on the display pop up to reduce repeated audio through multiple mics.

The screenshot shows a meeting interface with a 'Display' pop-up menu. The pop-up menu is titled 'Display' and contains the following sections:

- Spark Devices**
  - Tracking Camera
  - 360 Camera
  - Student Device
- Computer**
  - Teacher Webcam
  - Student's Screen
  - Student Video
- Arrangement**
  - 360 Camera
  - Tracking Camera

The background shows a meeting room with a whiteboard and a video chat panel on the right. The bottom navigation bar includes icons for Mute, Video, Screen, Record, Create Poll, Breakout Room, Settings, and End.



## MEETING PAGE GLOBAL NAV



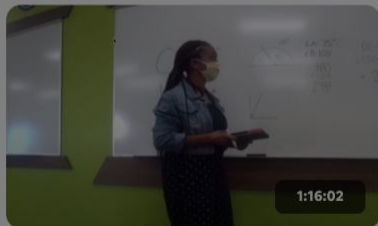
Have global nav carry over to both recordings and class feed for easier access to meeting actions.

Meeting

Recordings

Class Feed

My Classes



### Recorded Lecture

6/21/2021

Unit 10

Lorem ipsum dolor sit amet, consectetur adipiscing elit, sed do eiusmod tempor incididunt ut labore et dolore magna aliqua. Ut enim ad minim veniam, quis nostrud exercitation ullamco laboris nisi ut aliquip ex ea commodo consequat.

Public

Edit

Analytics

## RECORDINGS ANALYTICS



Teachers said they would like to be sent a recap similar to the recording analytics after class for attendance. Highlighting student engagement.

### Viewers

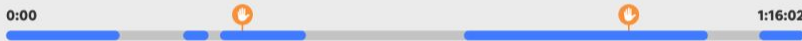


Firstname  
Lastname

Watch time (mins): **47:02**

Questions: **2**

0:00



1:16:02



Watch time (mins): **32:48**

Questions: **1**

**10.**

**Final Deliverables**

# SPARK

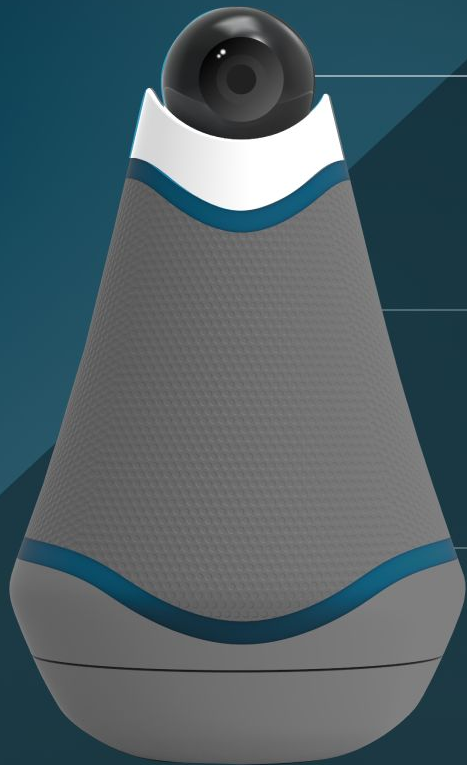
A hybrid learning product with a 360 degree camera, mic, and speaker integrated with a video conferencing platform, that facilitates a more intuitive and collaborative learning environment.





# SPARK

PRODUCTS



- **360 CAMERA**

- **AUDIO + SPEAKERS**

- **RING LIGHT**





- 360 CAMERA

- AUDIO + SPEAKERS

- RING LIGHT



- 360 CAMERA

- AUDIO + SPEAKERS

- RING LIGHT

# HUB REMOTE

---



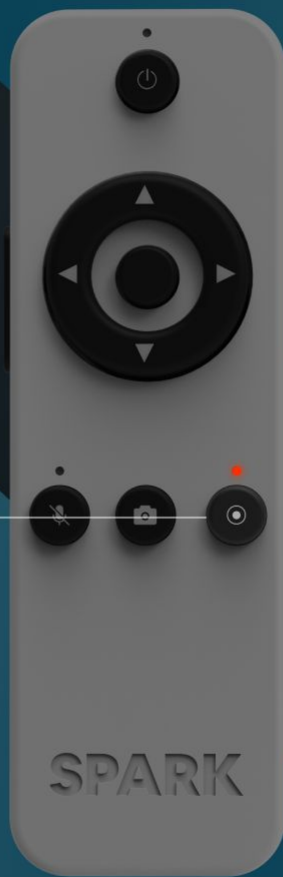
MUTE •



SET CAMERA •



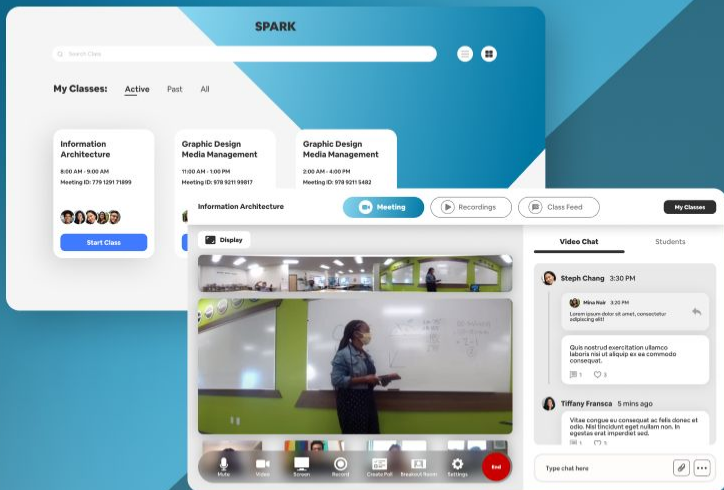
RECORD •





**DOCK YOUR  
TABLET WITH  
SPARK.**





# SPARK

## SOFTWARE





# SPARK

Q Search Class



## My Classes:

Active

Past

All

### Information Architecture

8:00 AM - 9:00 AM  
Meeting ID: 779 1291 71899



Start Class

### Graphic Design Media Management

11:00 AM - 1:00 PM  
Meeting ID: 978 9211 99817



Start Class

### Graphic Design Media Management

2:00 AM - 4:00 PM  
Meeting ID: 978 9211 5482



Start Class



## HOME

Teachers are able to start anyone of their classes directly from the homepage, as well view previous classes.

Information Architecture

Meeting Recordings Class Feed My Classes

Display

Video Chat Students

**Steph Chang** 3:30 PM

**Mina Nair** 3:20 PM  
 Lorem ipsum dolor sit amet, consectetur adipiscing elit!

Quis nostrud exercitation ullamco laboris nisi ut aliquip ex ea commodo consequat.  
 1 3

**Tiffany Fransca** 5 mins ago  
 Vitae congue eu consequat ac felis donec et odio. Nisl tincidunt eget nullam non. In egestas erat imperdiet sed.  
 1 3

Type chat here

Mute Video Screen Record Create Poll Breakout Room Settings End

# MEETINGS

The teacher hub is a stationary docking station that alerts and facilitates interaction between online students and in-person teachers through a 360 degree auto-tracking camera, audio input, light, and remote.

Information Architecture

Meeting Recordings Class Feed My Classes

**Unit 10**

Unit 9

Unit 8

Unit 7

Unit 6

Unit 5

Unit 4

Unit 3

Unit 2

**Recorded Lecture**  
6/21/2021  
Unit 10  
Lorem ipsum dolor sit amet, consectetur adipiscing elit, sed do eiusmod tempor incididunt ut labore et dolore magna aliqua. Ut enim ad minim veniam, quis nostrud exercitation ullamco laboris nisi ut aliquip ex ea commodo consequat.

Public Edit Analytics

**Demo**  
6/18/2021  
Unit 10  
Lorem ipsum dolor sit amet, consectetur adipiscing elit, sed do eiusmod tempor incididunt ut labore et dolore magna aliqua. Ut enim ad minim veniam, quis nostrud exercitation ullamco laboris nisi ut aliquip ex ea commodo consequat.

Private Edit Analytics

Mute Video Screen Record Create Poll Breakout Room Settings End

Recorded Lecture 6/21/2021

# RECORDINGS

The teacher hub is a stationary docking station that alerts and facilitates interaction between online students and in-person teachers through a 360 degree auto-tracking camera, audio input, light, and remote.

**Viewers**

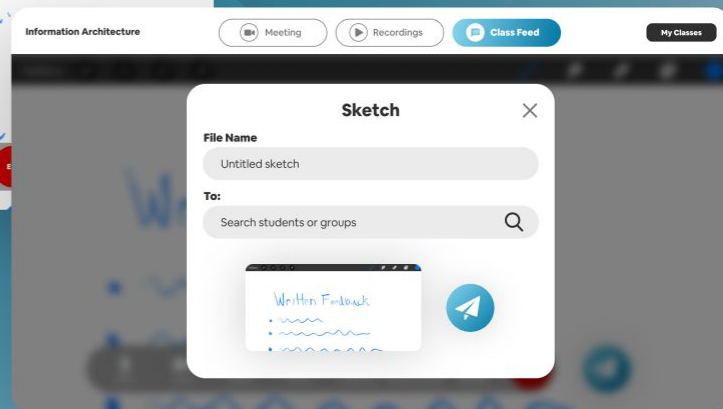
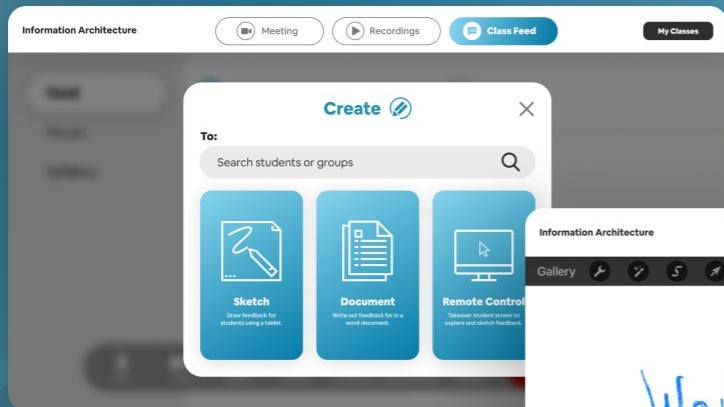
Stone Forsyth

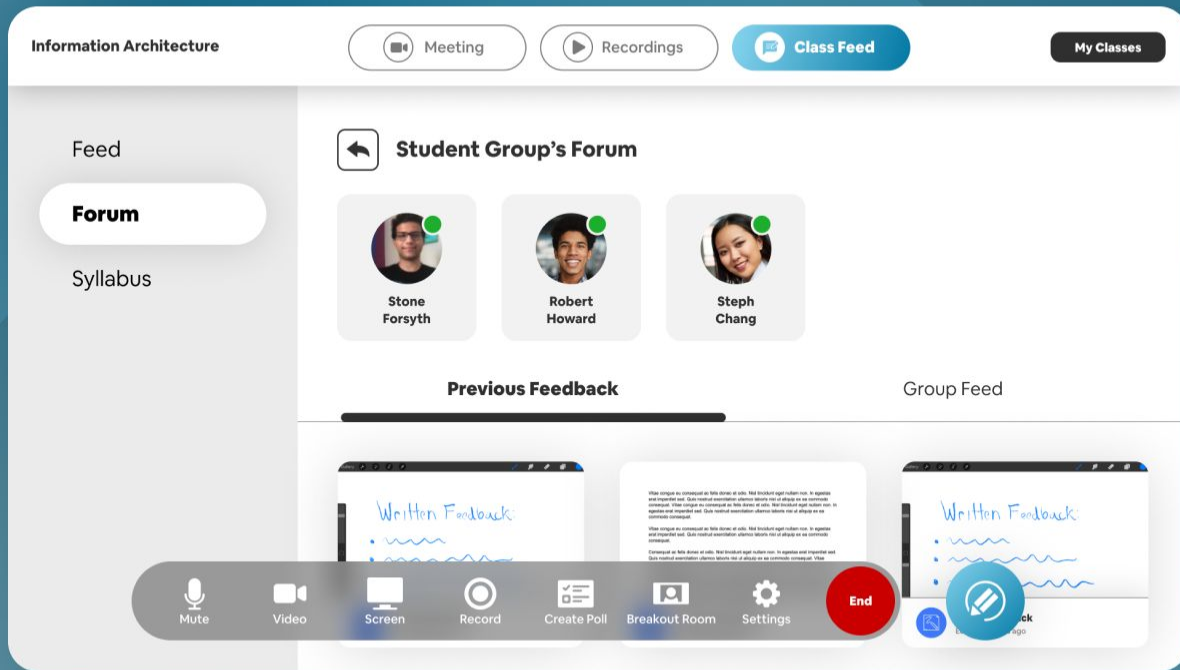
Watch time (mins): **47:02**

Questions: **2**

0:00 1:16:02

# FEEDBACK





## FORUM

The teacher hub is a stationary docking station that alerts and facilitates interaction between online students and in-person teachers through a 360 degree auto-tracking camera, audio input, light, and remote.

## SPARK

Information Architecture

Class Summary: 5/25/2021



Attendance: 18/20

Poll Results

Feedback



Riya  
Butani

Joined Class: **8:01am**

Left Class: **8:59am**

Meeting Minutes

**53mins**

Questions

**2**

Video Chats

**3**

Feed Posts

**1**

Number of Absences:

**1**



Steph  
Chang

Joined Class: **8:04am**

Left Class: **9:00am**

Meeting Minutes

**55mins**

Questions

**1**

Video Chats

**1**

Feed Posts

**0**

Number of Absences:

**3**

## CLASS SUMMARY

The teacher hub is a stationary docking station that alerts and facilitates interaction between online students and in-person teachers through a 360 degree auto-tracking camera, audio input, light, and remote.

**Our other  
deliverables.**



# Poster

## SPARK

### PROBLEM

Many schools have implemented hybrid learning systems, but it is not enough for an emotionally engaging, collaborative, and honest learning environment for both students and teachers.

### SOLUTION

Spark is a hybrid learning product with a 360-degree camera, mic, and speaker integrated with a video conferencing platform that facilitates a more intuitive and collaborative learning environment.



### 01

#### SPARK HUB

The teacher hub is a stationary docking station that alerts and facilitates interaction between online students and in-person teachers through a 360-degree auto-tracking camera, audio input, light, and remote.

#### REMOTE



### 02

#### SPARK SOFTWARE

Featuring a reimagined meeting experience, Spark shows all the students' shared screens at once, with a better messaging and feedback system. The platform also adds a social aspect to discussion posts with a class forum that students and teachers can look back on for feedback and questions. Lastly, the recordings include analytics to give the instructor a better understanding of their class's performance.



### 03

#### DOCKING STATION

The teacher tablet docks into the stationary hub when the teacher is not actively moving in order to promote a seamless transition between their desk and navigating the classroom.

# Lookbook

# SPARK



# **Vision Video**

[\*\*https://youtu.be/V5ScKEmlPzQ\*\*](https://youtu.be/V5ScKEmlPzQ)

**Thank you!**