Low-fi Prototype and Testing

click Education

Mission Statement: Never Leave Class Confused

Two perspectives:

- Student
  - Confused about lecture topics
- Teacher
  - Confused about student performance

Problem/Solution Overview

Problem:

- Students don’t want to publicly admit that they don’t understand class material, so teachers don’t have a reliable means by which to determine their students’ comprehension until it’s too late.

Solution:

- Anonymous student feedback removes the participation barrier, enabling teachers to both revisit what was misunderstood in real-time and to update their lesson plans based on this information.

Overview of Talk

1. Brainstorming and picking between possible devices and UIs
2. Narrowing UI flow for each task
3. Constructing prototype for tasks and necessary functionality
4. User experimentation and feedback

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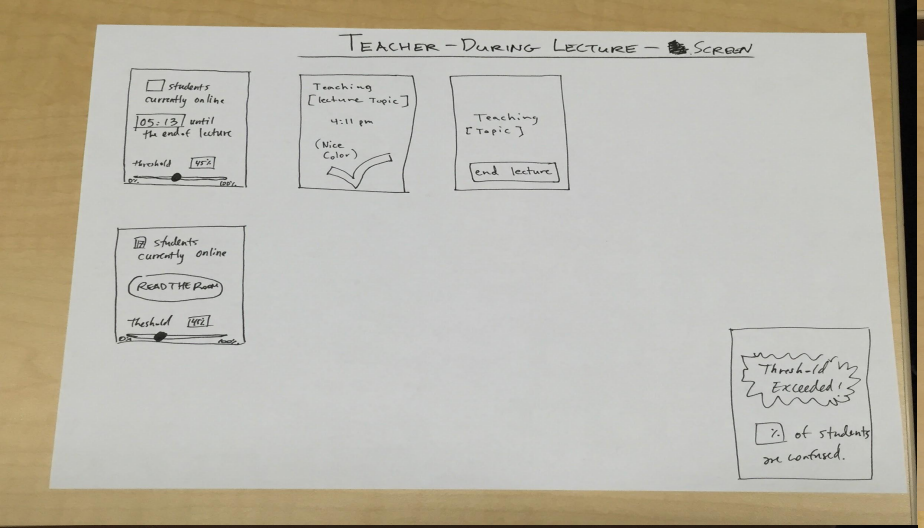
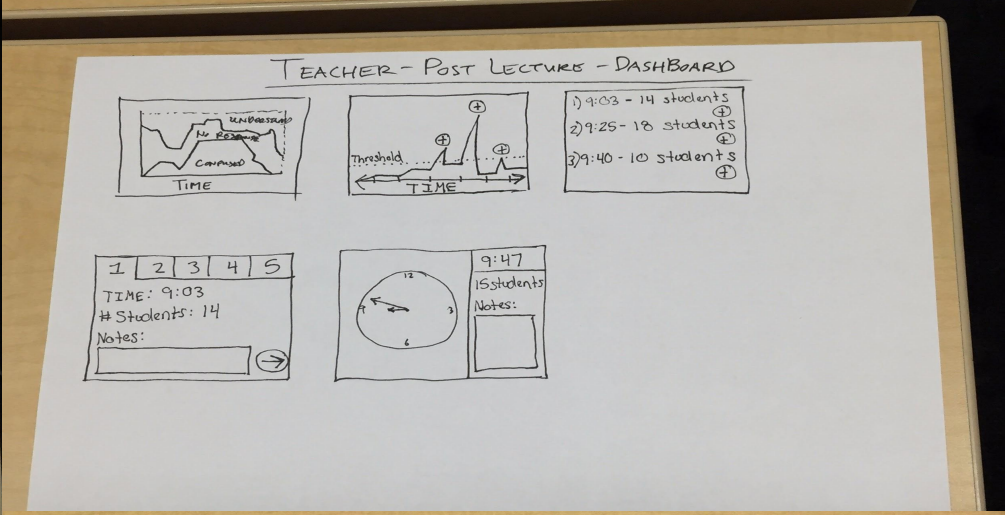
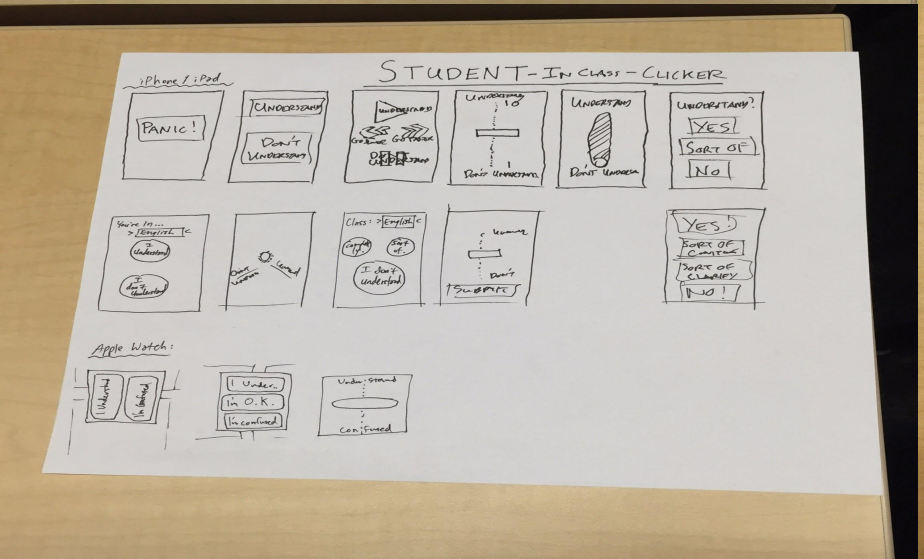
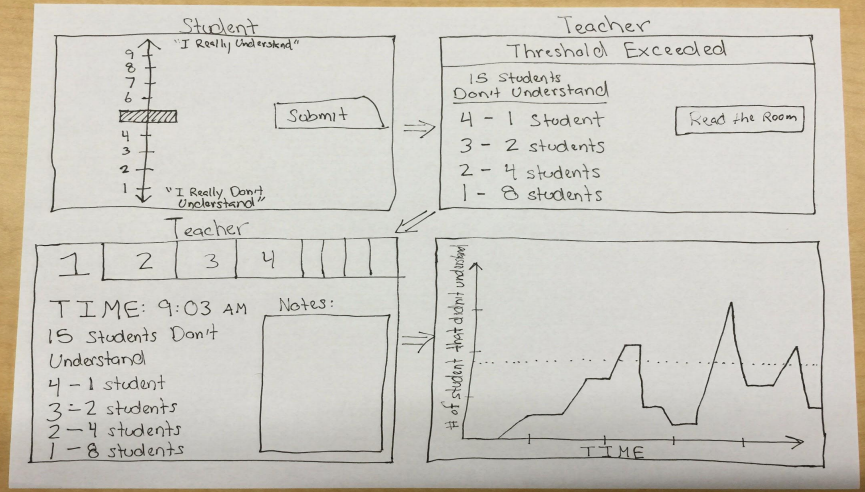
Possible UI choices

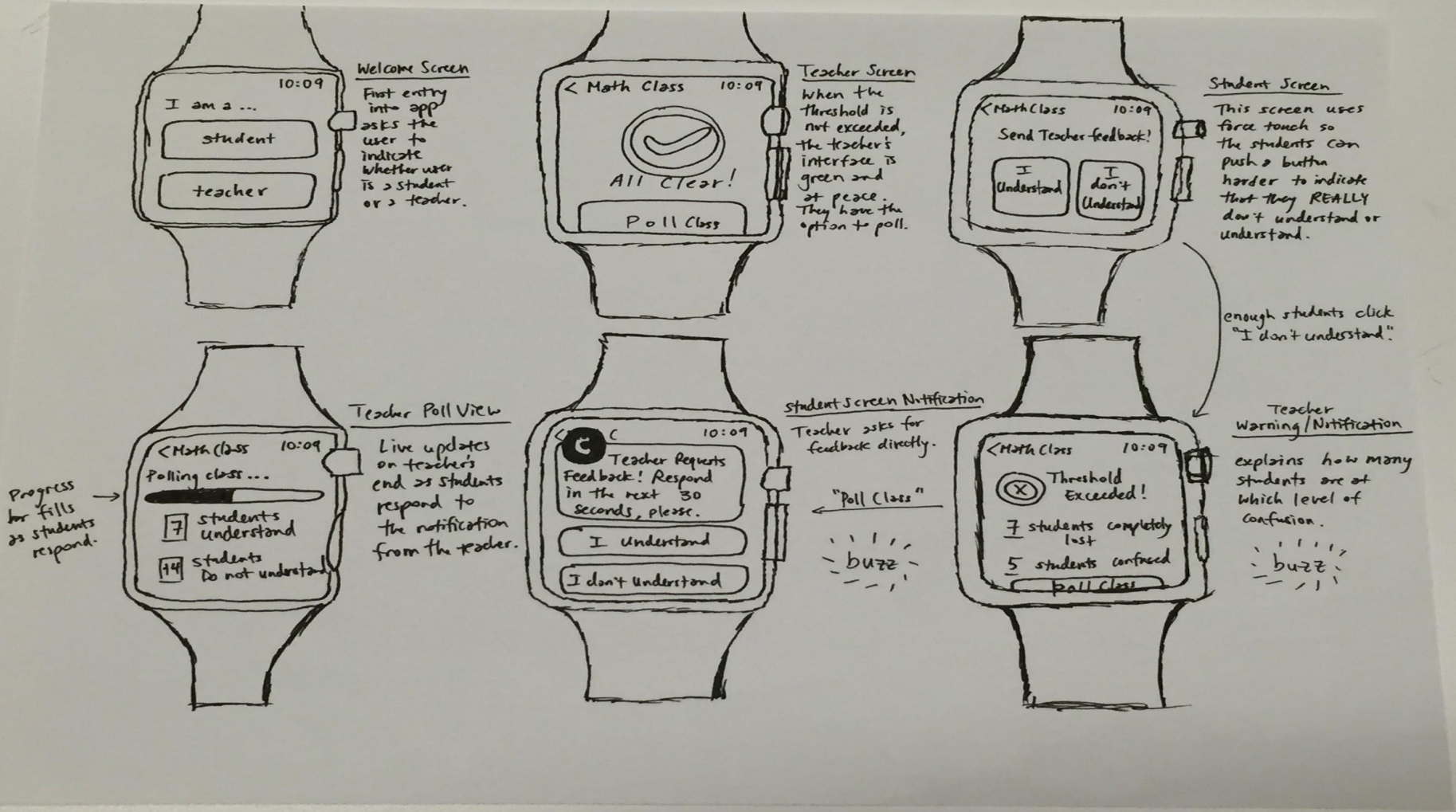
- Device choices
  - iPad vs. iPhone vs. Apple Watch vs. Google glasses
- Student-feedback mechanisms
  - Binary choice, slider, dial, etc.
- Teacher in-class feedback mechanism
  - Alarm, notification, screen change
- After-class data visualization for feedback
  - Frequency graph, “Current Status” graph, etc.


TEACHER – DURING LECTURE – SCREEN
students currently online
05:13 until the end of lecture
threshold 45%
Teaching [lecture Topic]
4:11 pm
(Nice Color)
Teaching [Topic]
end lecture
students currently online
READ THE ROOM
Threshold 45%
Threshold Exceeded!
% of students are confused.


TEACHER – POST LECTURE – DASHBOARD
UNDERSTAND
No Response
CONFUSED
TIME
Threshold
TIME
1) 9:03 - 14 students
2) 9:25 - 18 students
3) 9:40 - 10 students
1 2 3 4 5
TIME: 9:03
Students: 14
Notes:
9:47
15 students
Notes:


STUDENT – IN CLASS – CLICKER
iPhone / iPad
PANIC!
UNDERSTAND
DON'T UNDERSTAND
UNDERSTAND
DON'T UNDERSTAND
UNDERSTAND
DON'T UNDERSTAND
UNDERSTAND?
YES
SORT OF
NO
You're in...
> English <
I understand
I don't understand
Class: > English <
I don't understand
SUBMIT
YES!
SORT OF CONTROL
SORT OF CLARIFY
NO!
Apple Watch:
I Understand
I'm confused
I Under.
I'm O.K.
I'm confused
Understand
Confused


Student
"I Really Understand"
Submit
"I Really Don't Understand"
Teacher
Threshold Exceeded
15 students Don't Understand
4 - 1 Student
3 - 2 students
2 - 4 students
1 - 8 students
Read the Room
Teacher
1 2 3 4
TIME: 9:03 AM
15 Students Don't Understand
4 - 1 student
3 - 2 students
2 - 4 students
1 - 8 students
Notes:
# of student that didn't understand
TIME


10:09
I am a ...
student
teacher
Welcome Screen
First entry into app asks the user to indicate whether user is a student or a teacher.
< Math Class
10:09
All Clear!
Poll Class
Teacher Screen
When the threshold is not exceeded, the teacher's interface is green and at peace. They have the option to poll.
< Math Class
10:09
Send Teacher feedback!
I Understand
I don't Understand
Student Screen
This screen uses force touch so the students can push a button harder to indicate that they REALLY don't understand or understand.
enough students click "I don't understand."
< Math Class
10:09
Polling class ...
7 students understand
14 students do not understand
Progress bar fills as students respond.
Teacher Poll View
Live updates on teacher's end as students respond to the notification from the teacher.
10:09
Teacher Requests Feedback! Respond in the next 30 seconds, please.
I Understand
I don't Understand
Student Screen Notification
Teacher asks for feedback directly.
"Poll Class"
buzz
< Math Class
10:09
Threshold Exceeded!
7 students completely lost
5 students confused
Poll Class
Teacher Warning/Notification
explains how many students are at which level of confusion.
buzz

Interface Choice and Brief Justification

We decided iPads/iPhones because:

- Although Apple Watch was convenient for student input and teacher notifications, it's constrained by low adoption.
- More importantly, most other interfaces were cumbersome on such a small screen, especially after-lecture review
- iPads and iPhones were the opposite: all interfaces were intuitive and convenient, and adoption is high

Interface Choice and Brief Justification Continued...

We decided on binary input because:

- It's less disruptive (brief glance at phone)
- Easier for teacher to interpret than "continuous" input

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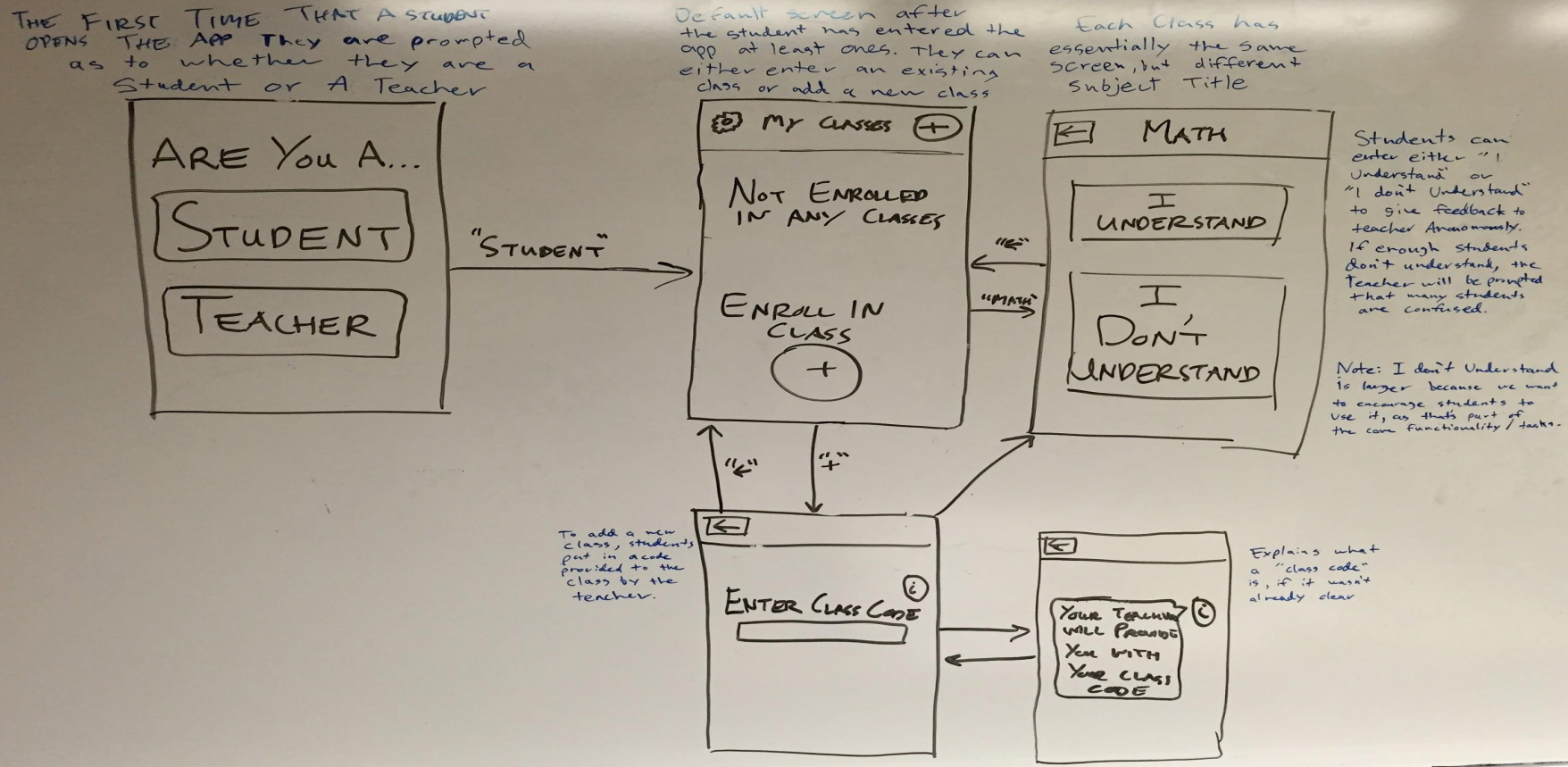
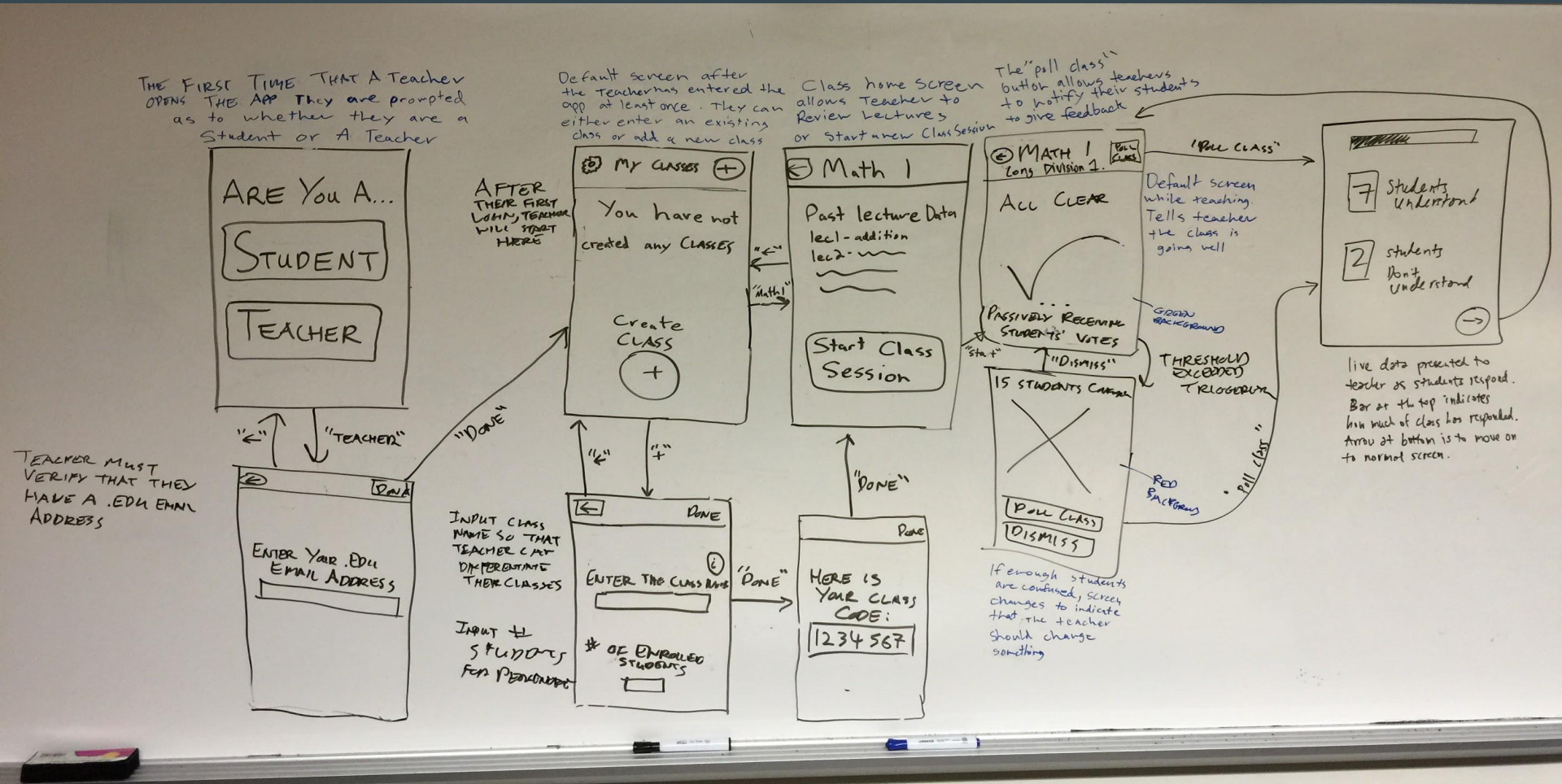
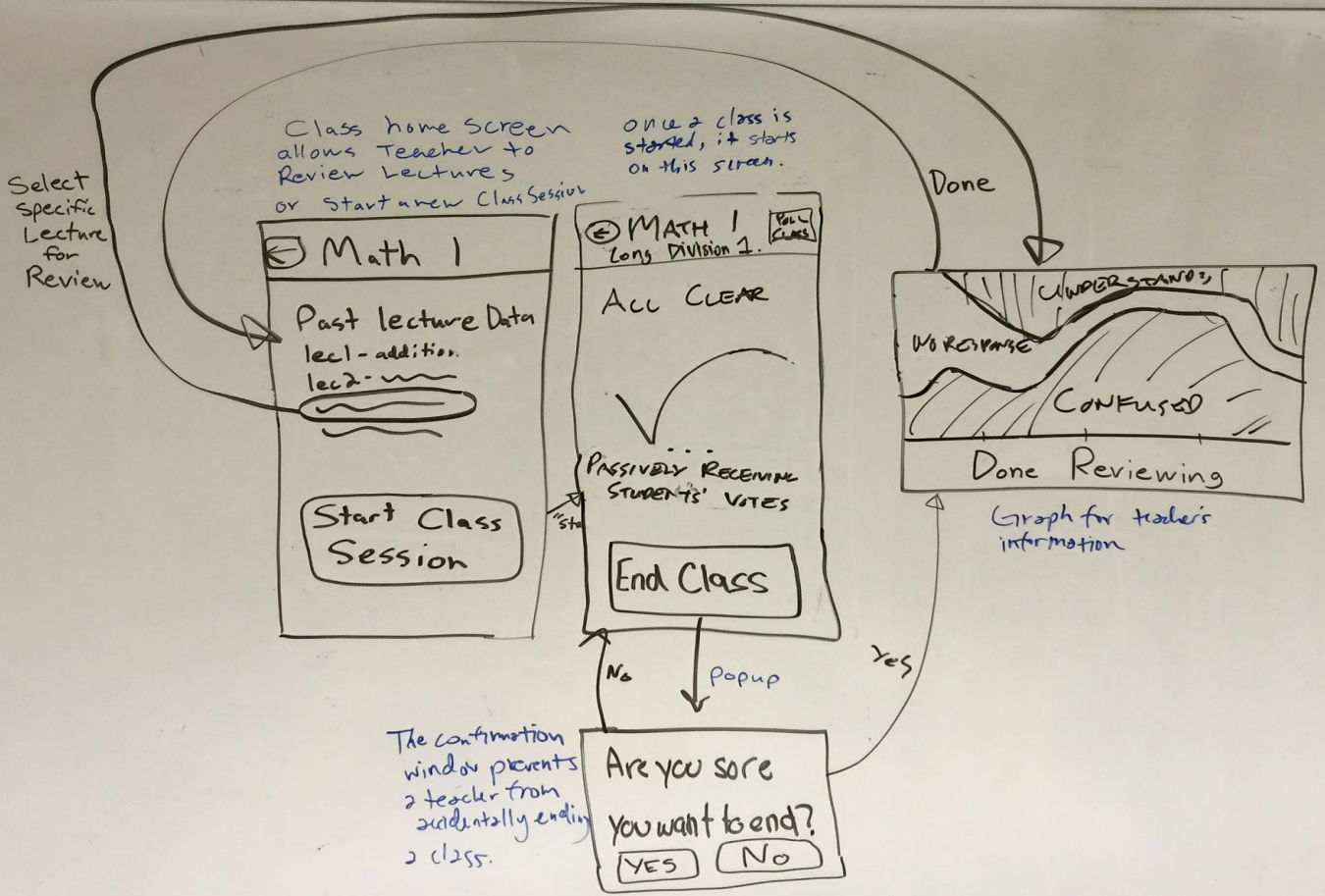
Task 1: Student Gives Feedback



Task 2: Teacher "Reads the Room"



Task 3: Teacher Reviews Lecture



Overview of Talk

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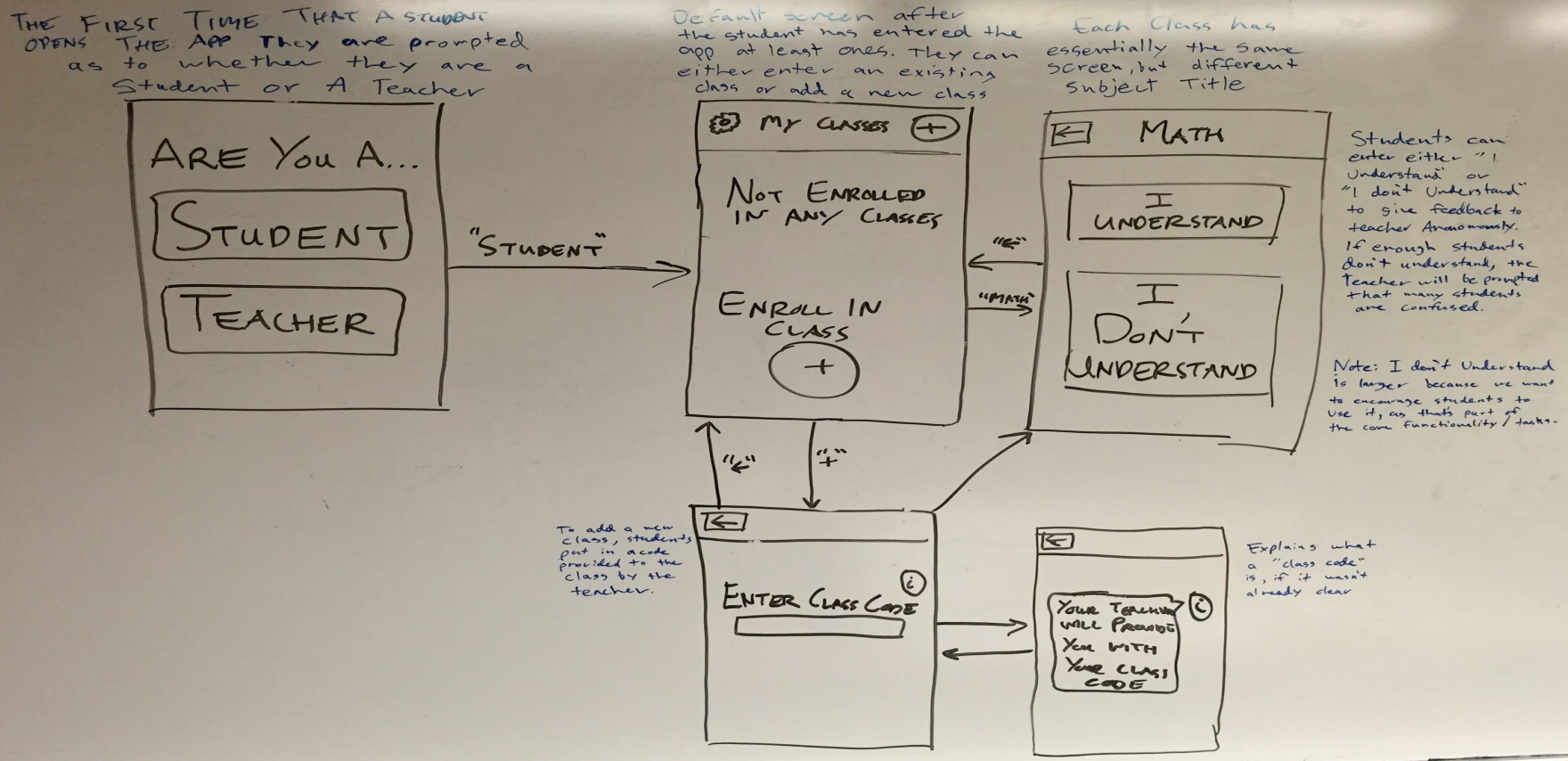
Prototype Decisions

- Used the Style and Technique recommended by Landay: Pen and Paper for Low-Fi Prototype
  - Also allowed trying on-site updates of prototype

- Significant use of pop-ups (also in flow) because:
  - Simple way to transmit small bits of information
  - Avoids user losing track of place in app

Flow & Low-Fi Animation

Task 1: Student Gives Feedback

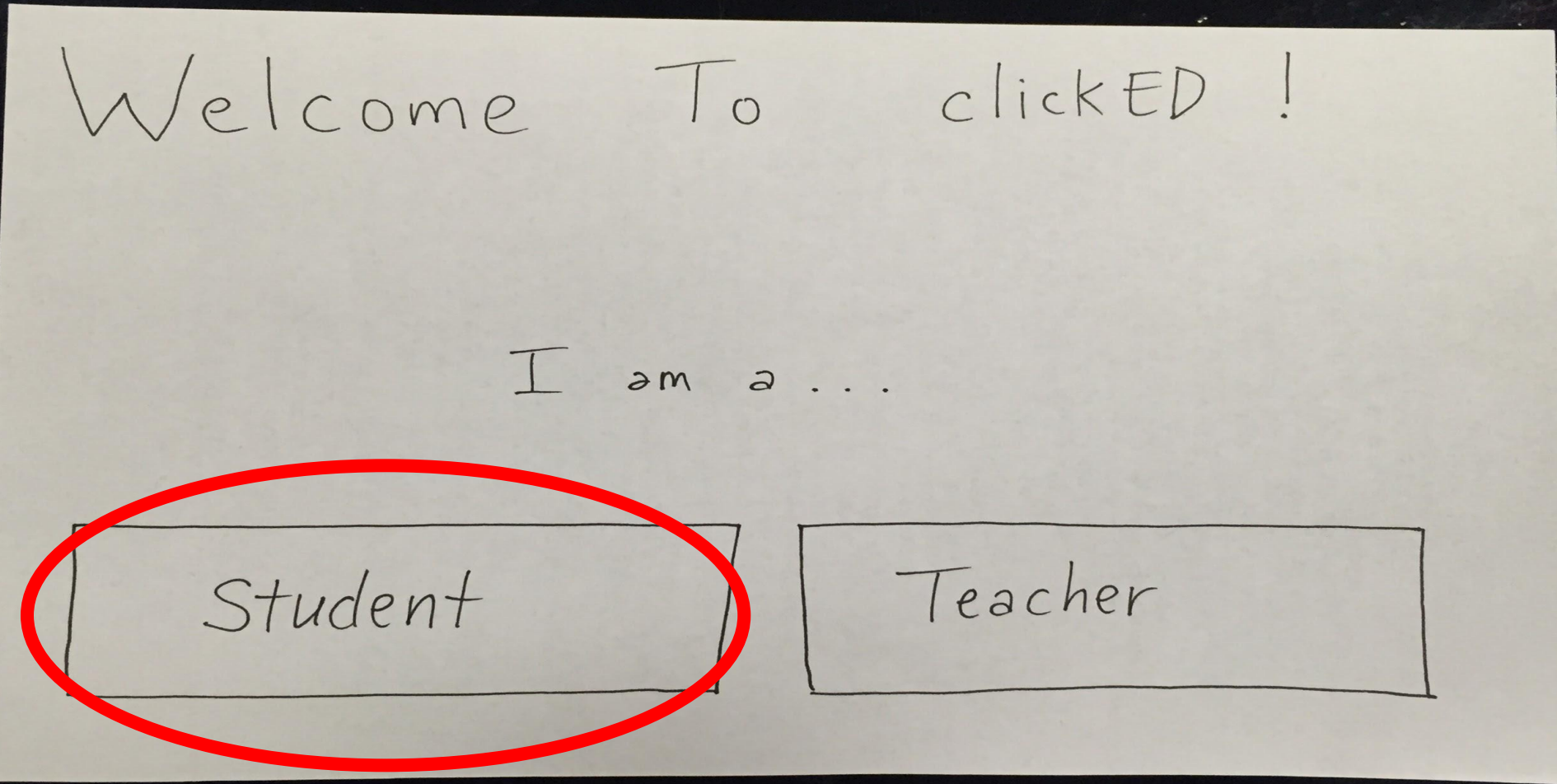


Welcome To clickED !

I am a . . .

Student

Teacher


Welcome To clicked !
I am a . . .
Student
Teacher

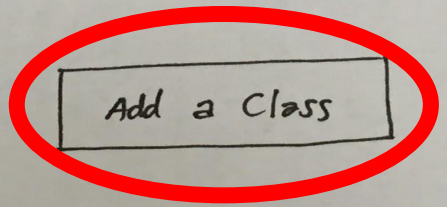
My Classes

- NO CLASSES -

Add a Class

My Classes

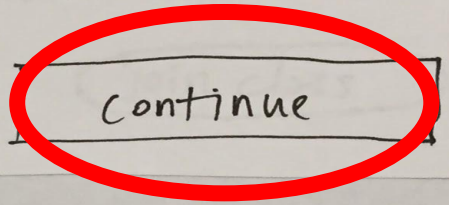
- NO CLASSES -



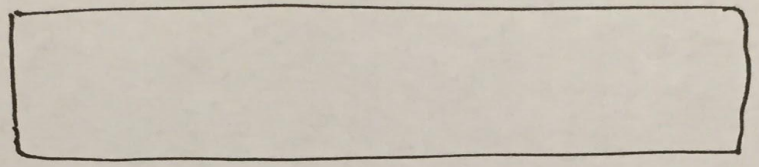
Your Teacher will give you a 5-digit code to join the class.

continue

Your Teacher will give you a 5-digit code to join the class.

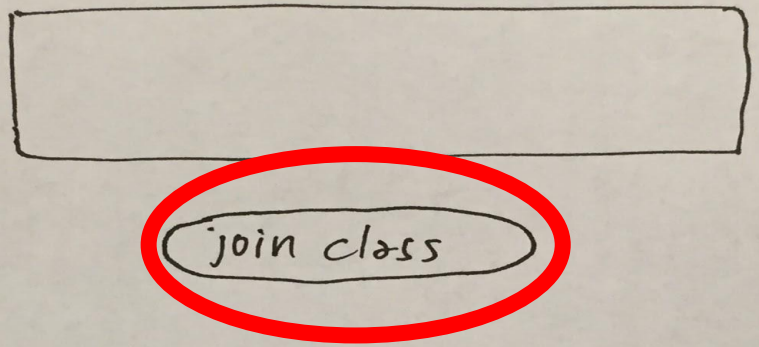


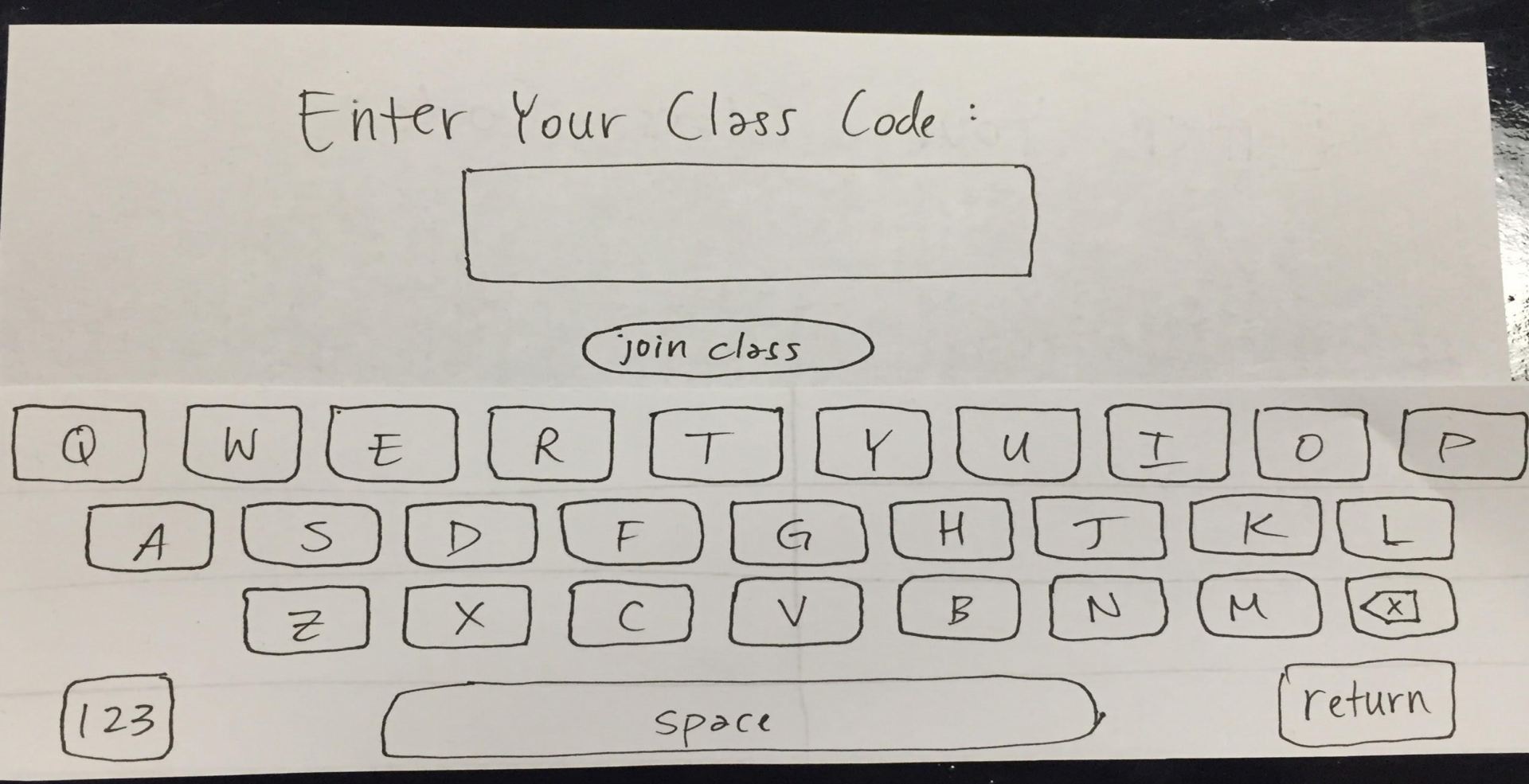
Enter Your Class Code :

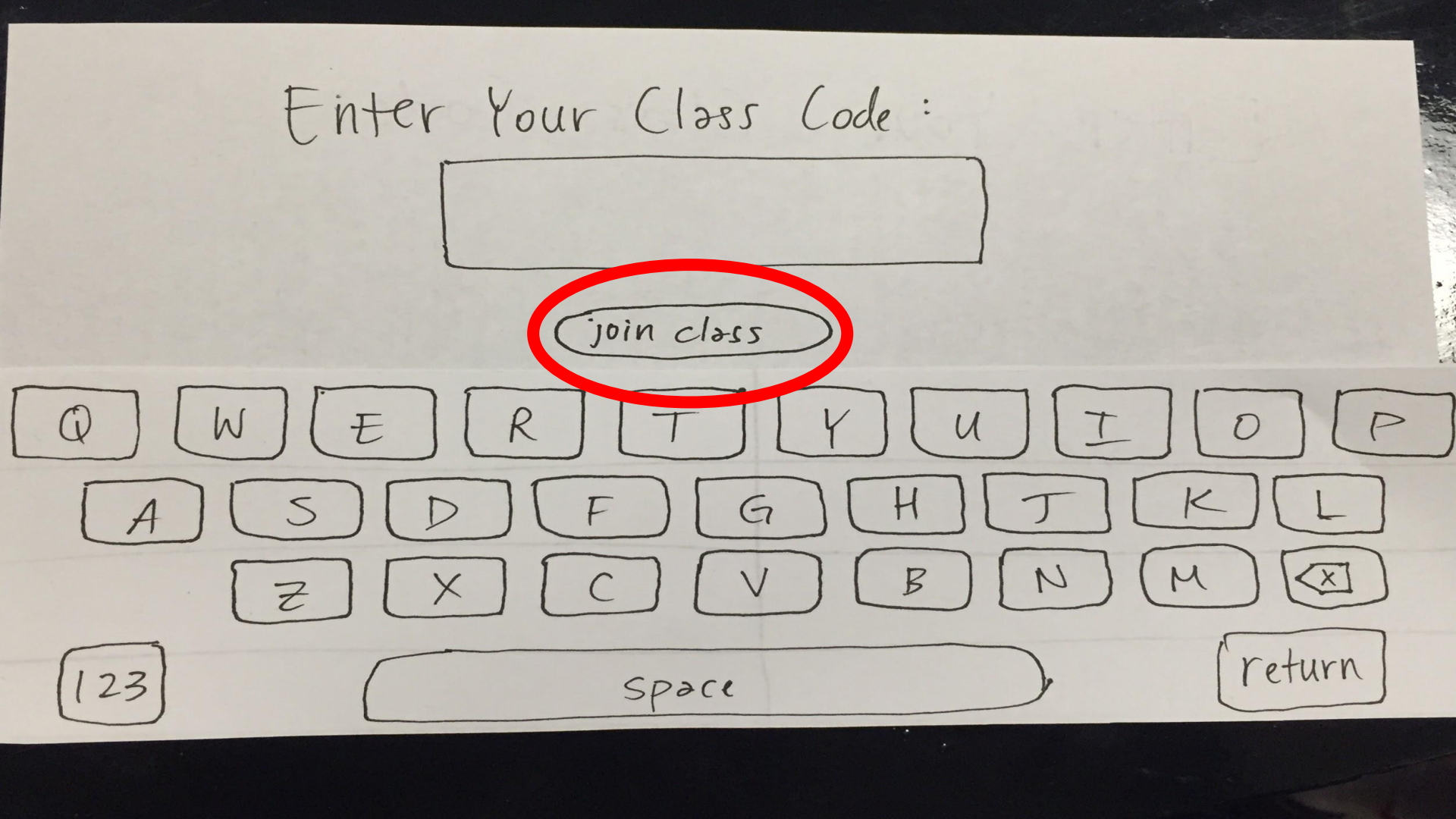


join class

Enter Your Class Code :




Enter Your Class Code :
join class
Q W E R T Y U I O P
A S D F G H J K L
Z X C V B N M
123
space
return


Enter Your Class Code :
join class
Q W E R T Y U I O P
A S D F G H J K L
Z X C V B N M
123
space
return

Enter Your Class Code:

3M2XZ

Are you sure you want to join "Math: Pre-Calculus"?

Yes, join class

No, enter code again

Enter Your Class Code:

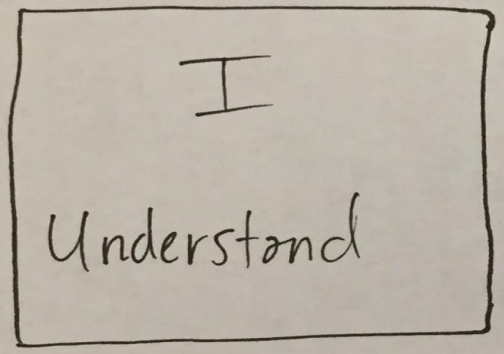
3M2XZ

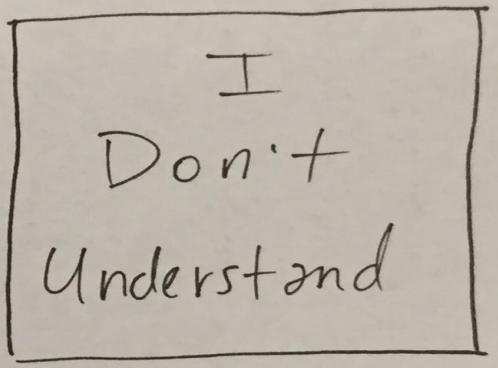
Are you sure you want to join "Math: Pre-Calculus"?

Yes, join class

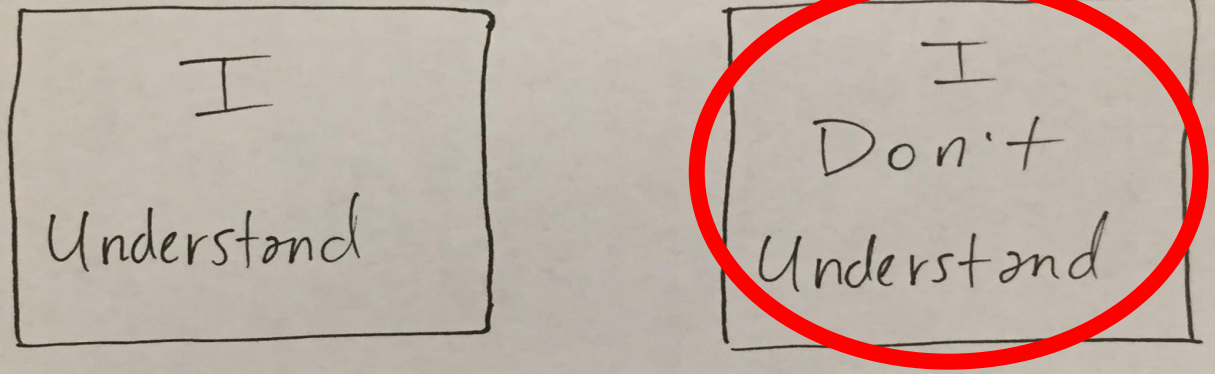
No, enter code again

Math: Pre-Calculus





Math: Pre-Calculus



Math: Pre-Calculus

Your response has been recorded. Hitting the same button will not relay any additional information for 3 minutes.

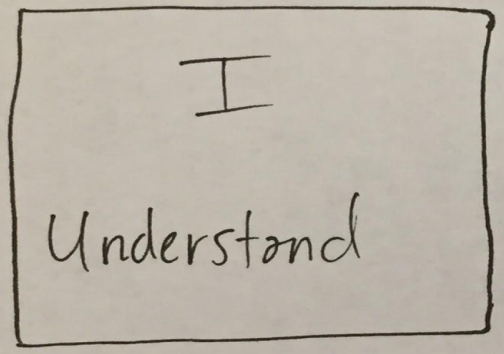
okay

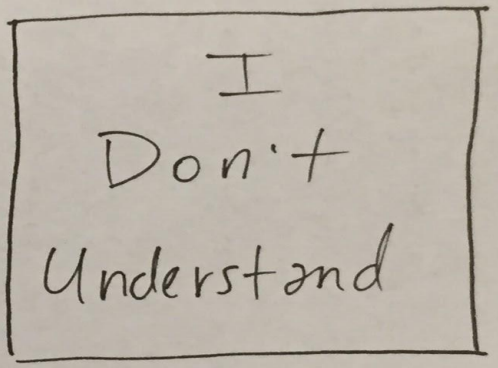
Math: Pre-Calculus

Your response has been recorded. Hitting the same button will not relay any additional information for 3 minutes.

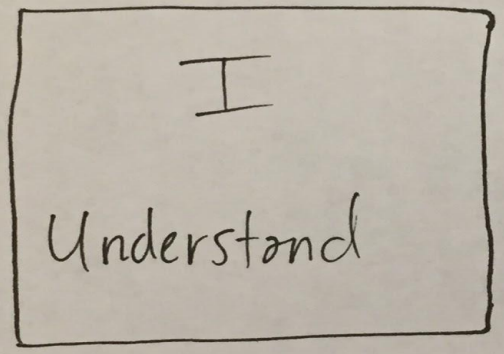
okay

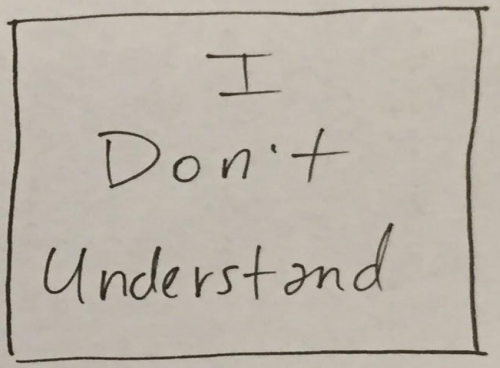
Math: Pre-Calculus





Math: Pre-Calculus



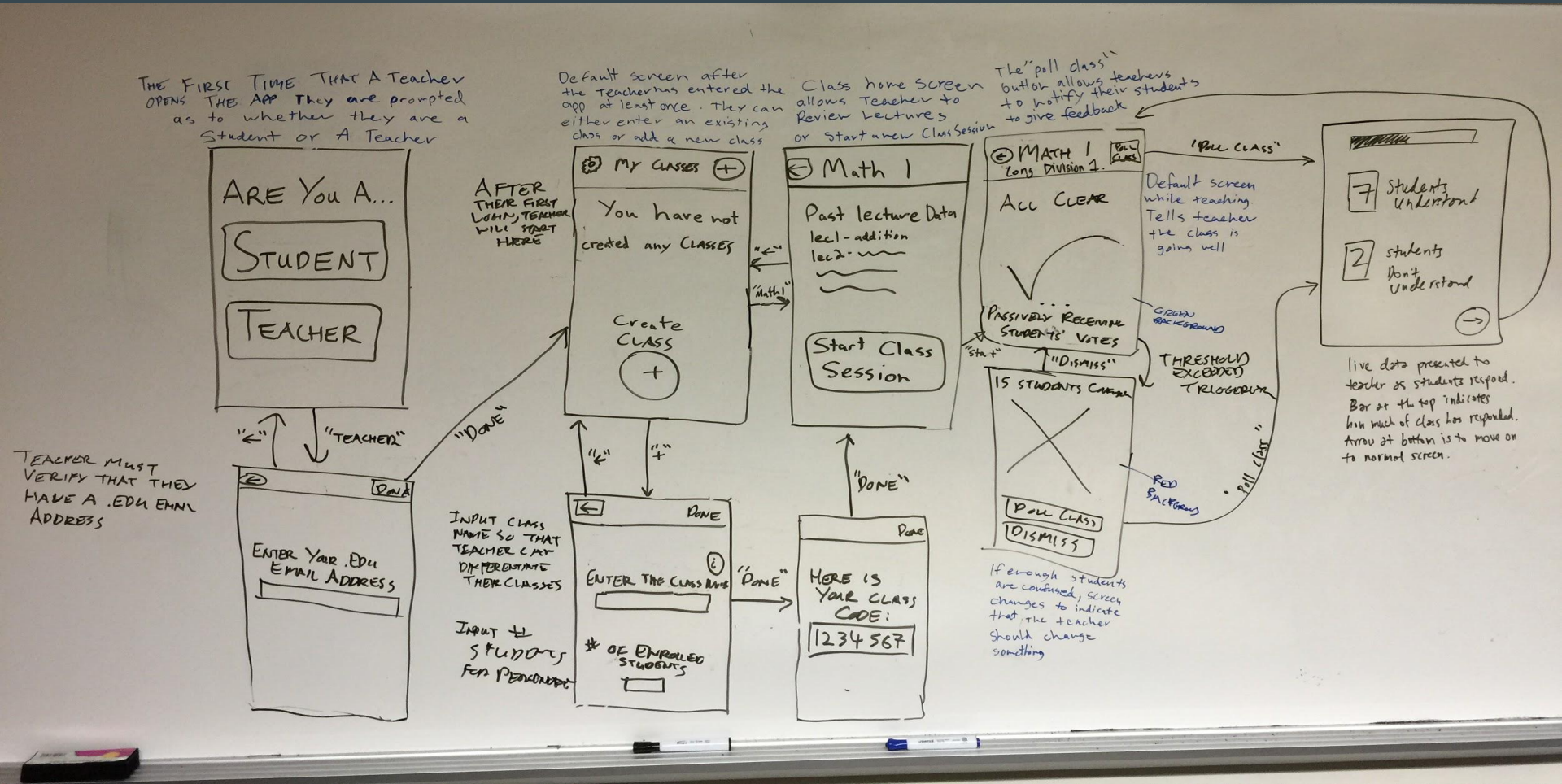


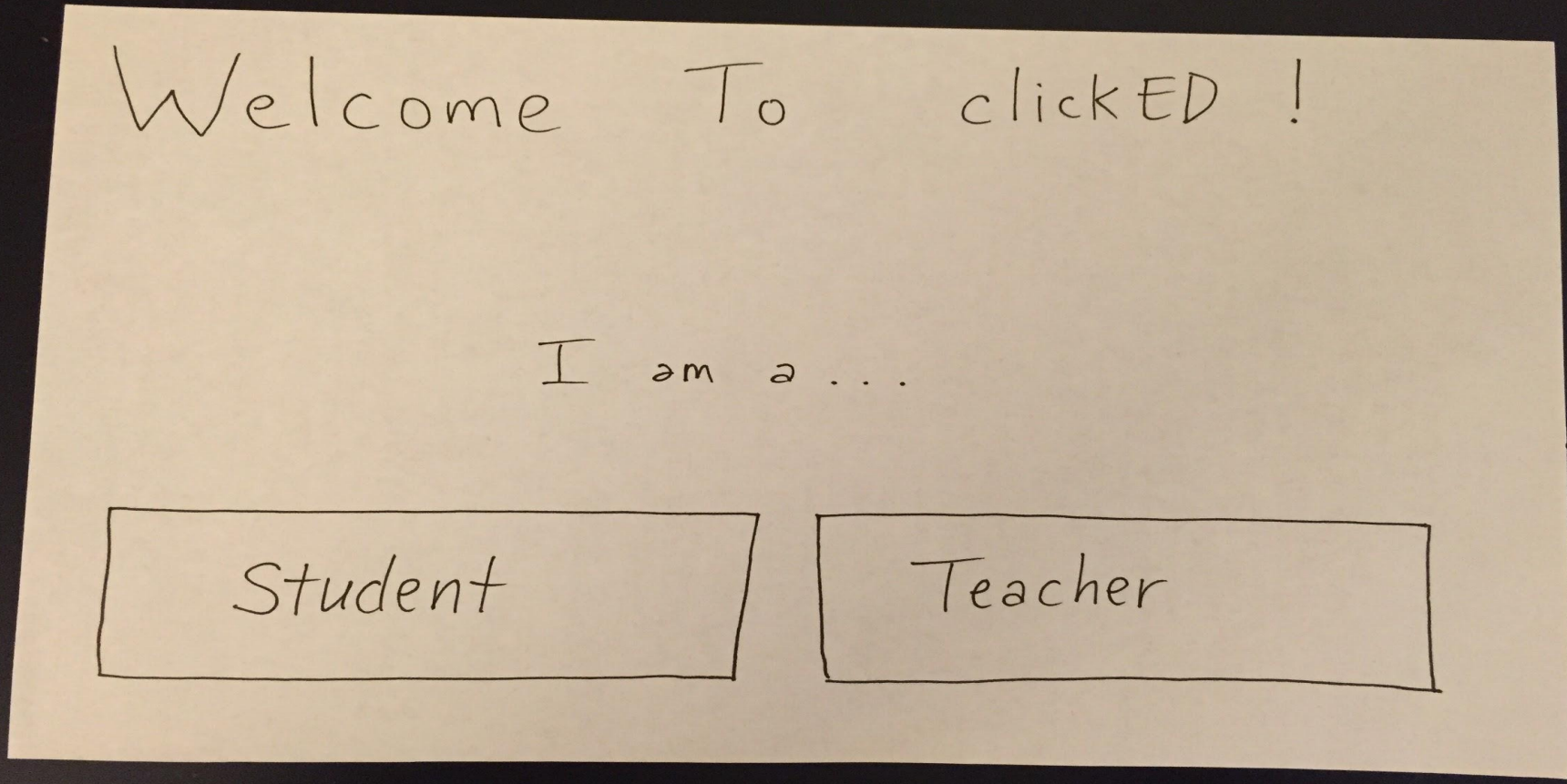
My Classes

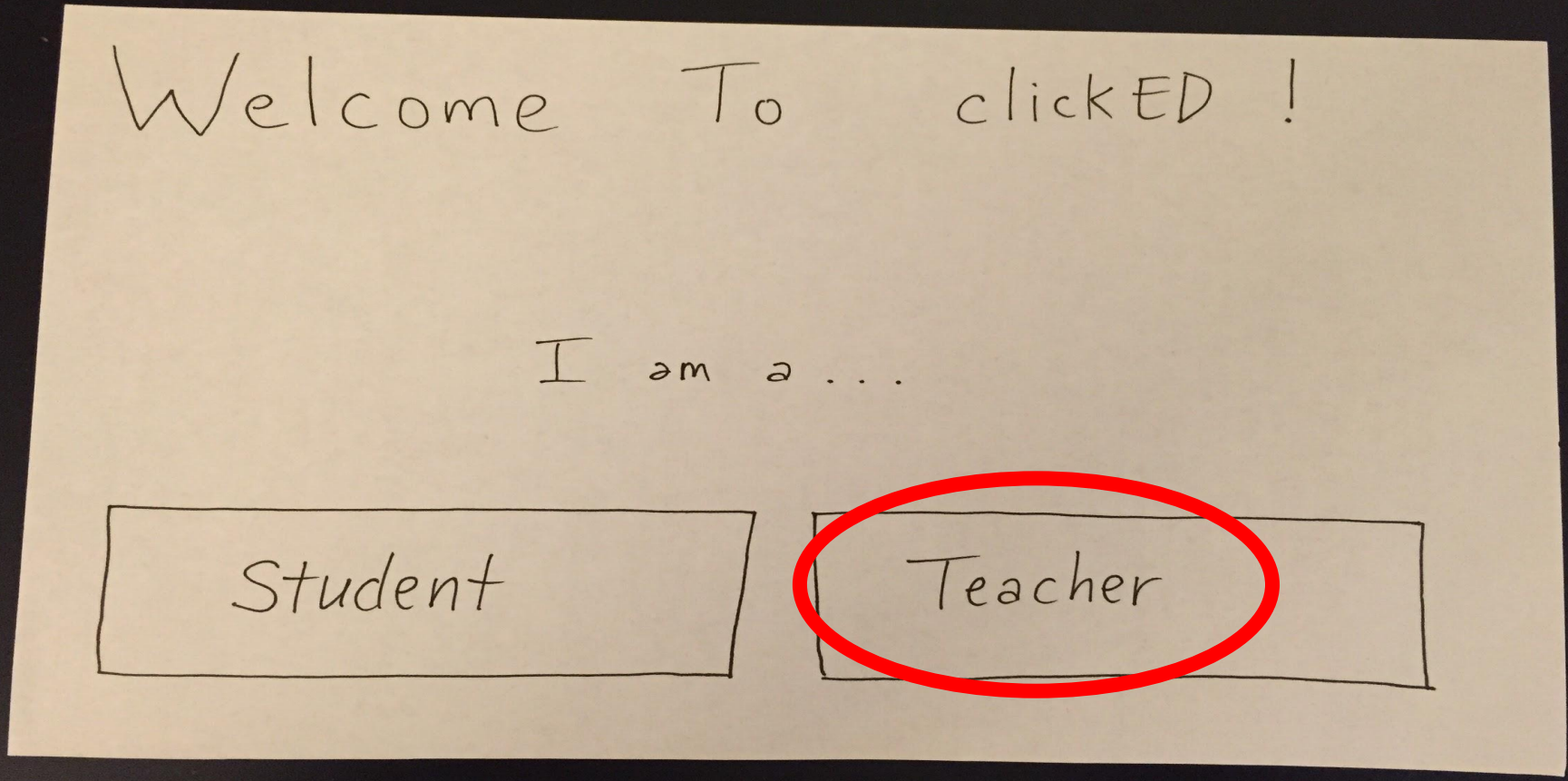
English: British Literature

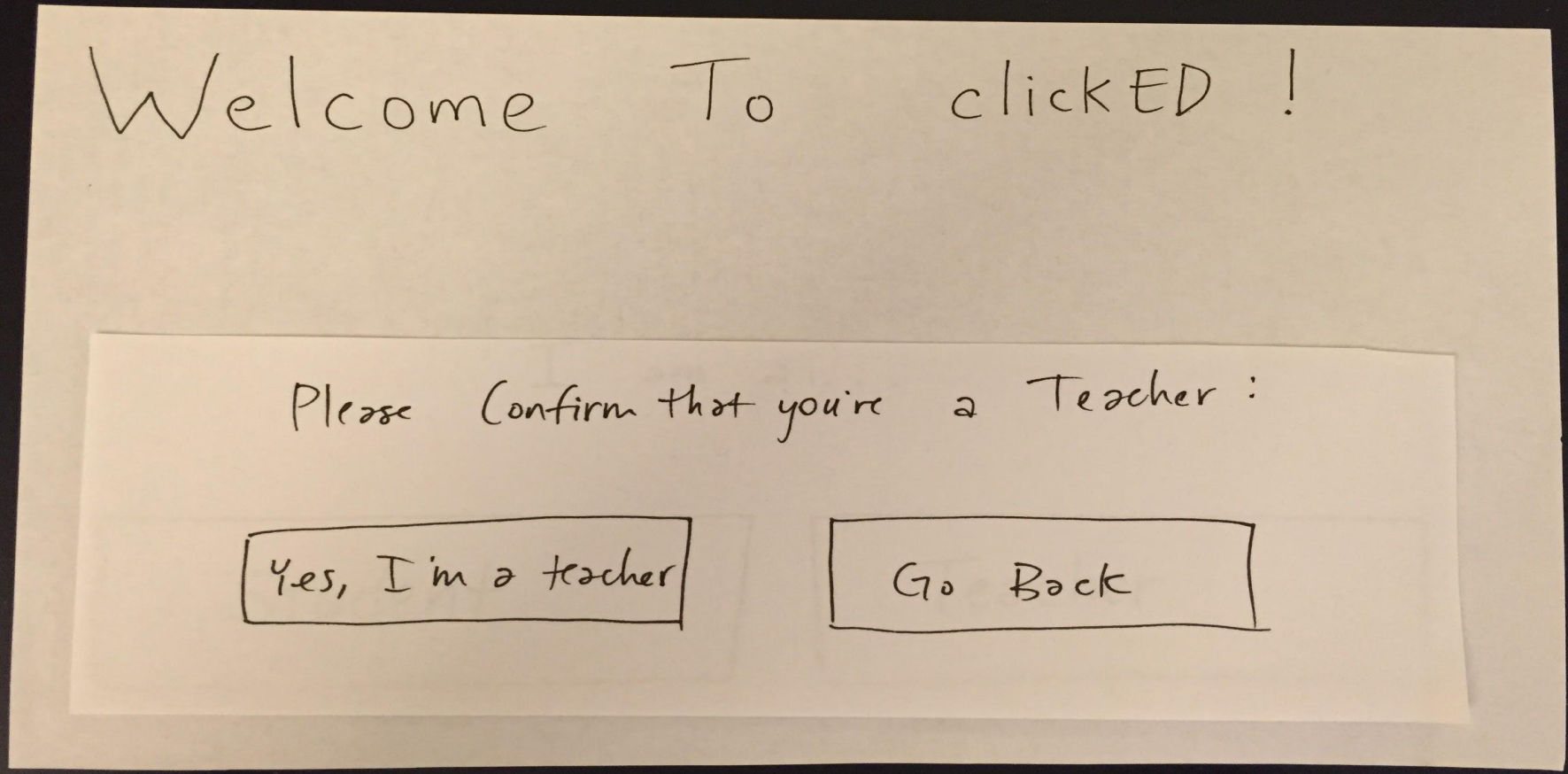
Add a Class

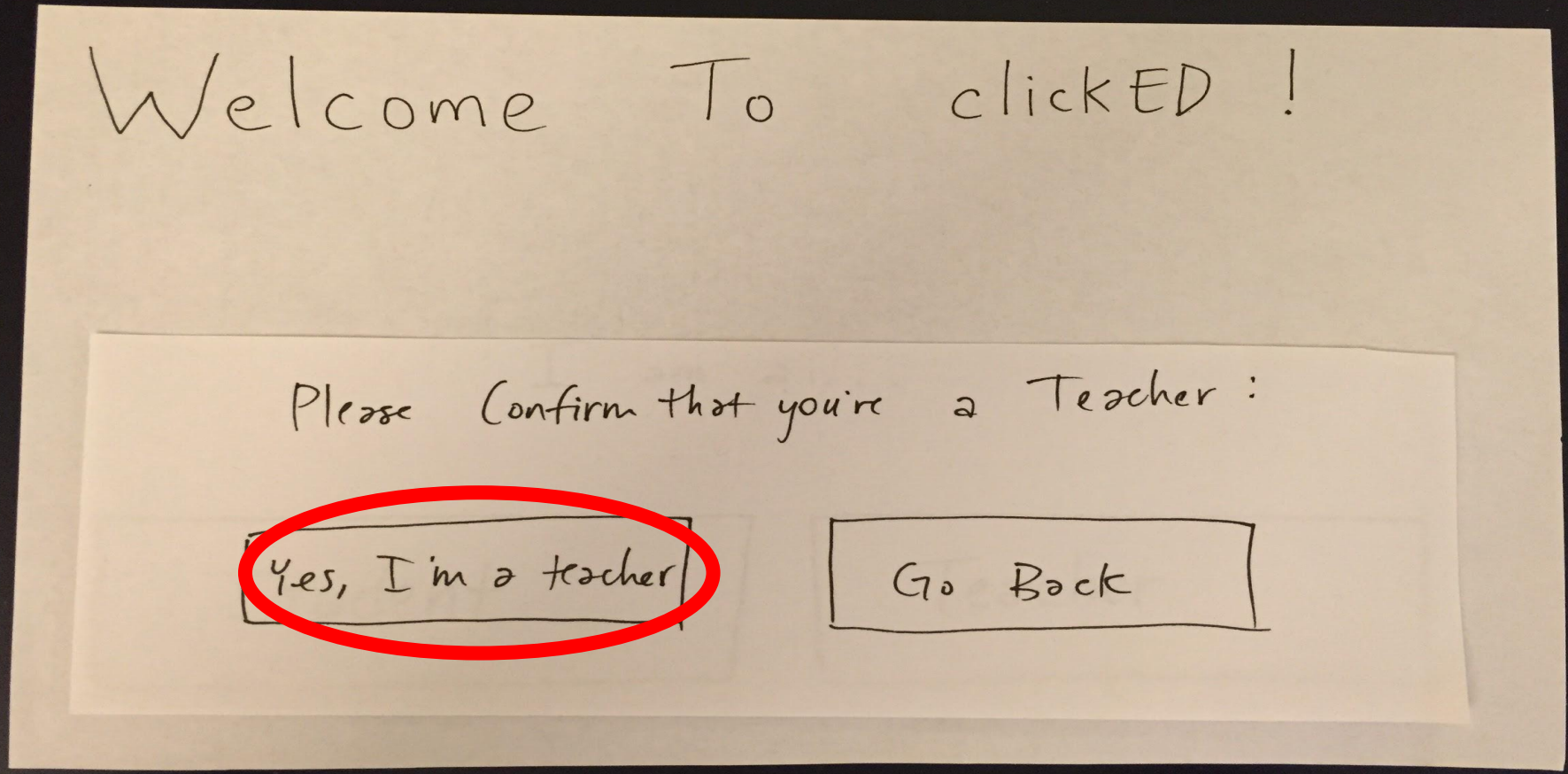
Task 2: Teacher "Reads the Room"




Welcome To clickED !
I am a . . .
Student
Teacher


Welcome To clickED !
I am a . . .
Student
Teacher


Welcome To clicked !
Please Confirm that you're a Teacher :
Yes, I'm a teacher
Go Back


Welcome To clicked !
Please Confirm that you're a Teacher :
Yes, I'm a teacher
Go Back

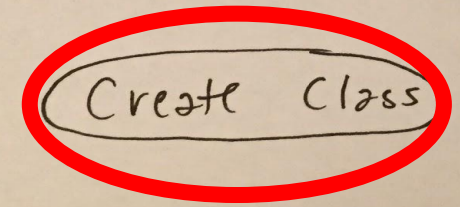
Teacher Dashboard

- NO CLASSES -

Create Class

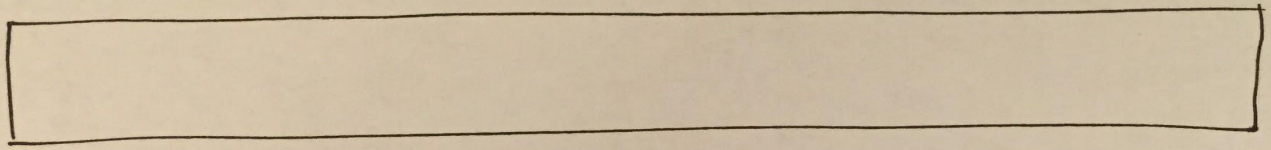
Teacher Dashboard

- NO CLASSES -



Create a Class

Enter Class Name:

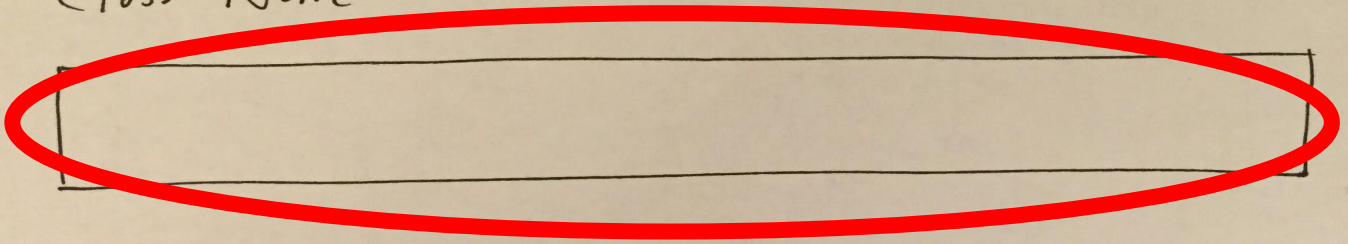


Submit name

Cancel

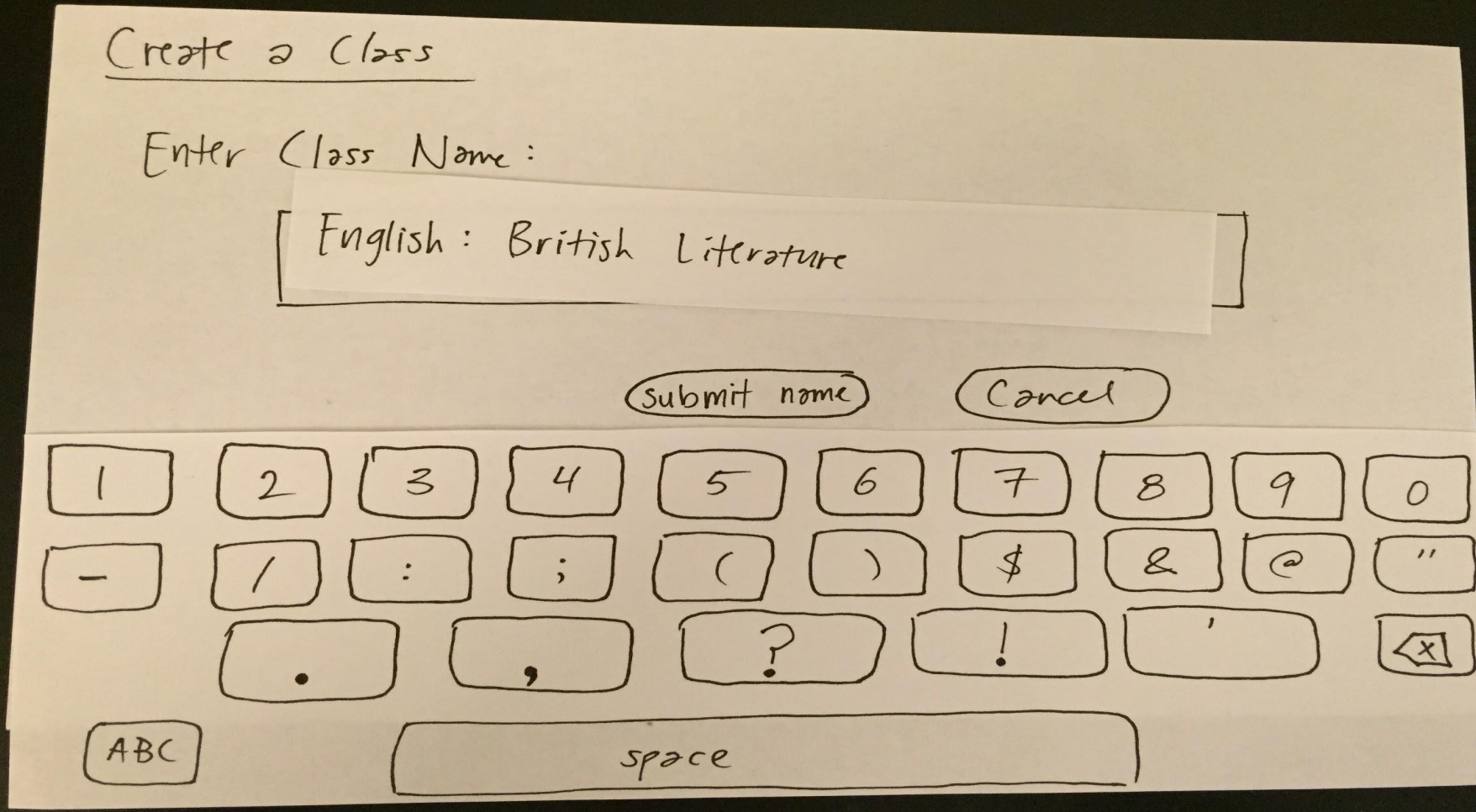
Create a Class

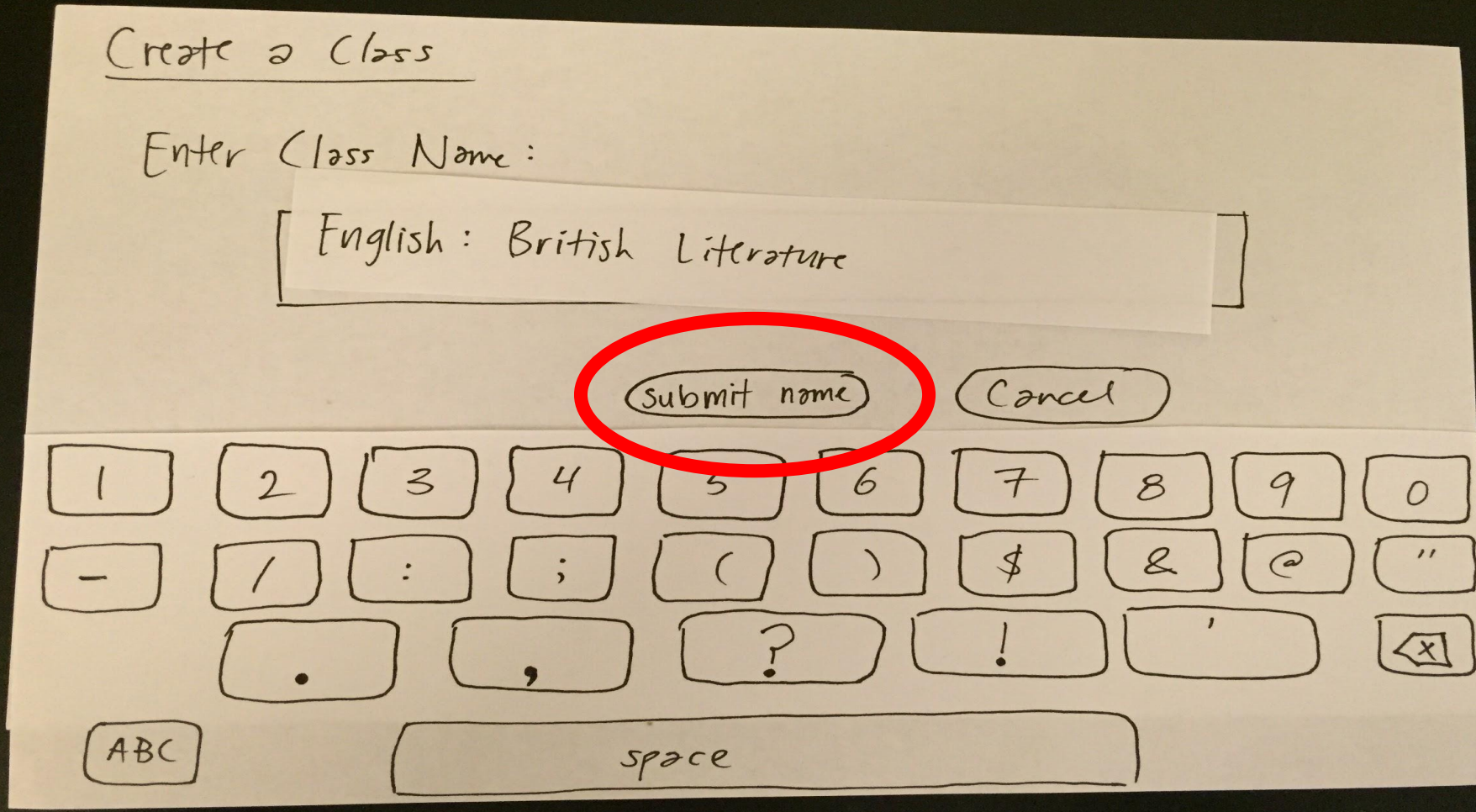
Enter Class Name:



Submit name

Cancel


Create a Class
Enter Class Name:
English: British Literature
submit name
Cancel
1 2 3 4 5 6 7 8 9 0
- / : ; ( ) $ & @ "
. , ? ! '
ABC
space


Create a Class
Enter Class Name:
English: British Literature
Submit name
Cancel
1 2 3 4 5 6 7 8 9 0
- / : ; ( ) $ & @ "
. , ? ! '
ABC
space

Create a Class

Your class English: British Literature was successfully created!

Your class code is 76543

Continue

Create a Class

Your class English: British Literature was successfully created!

Your class code is 76543

Continue

English: British Literature

code: 76543

students enrolled:

27

Past Lectures

"King Lear and Integrals"	10-15-15
"Shakespeare's Limits"	10-14-15
"Deriving English Words"	10-13-15
"My Fair Series"	10-12-15

Start A Lecture

English: British Literature

code: 76543

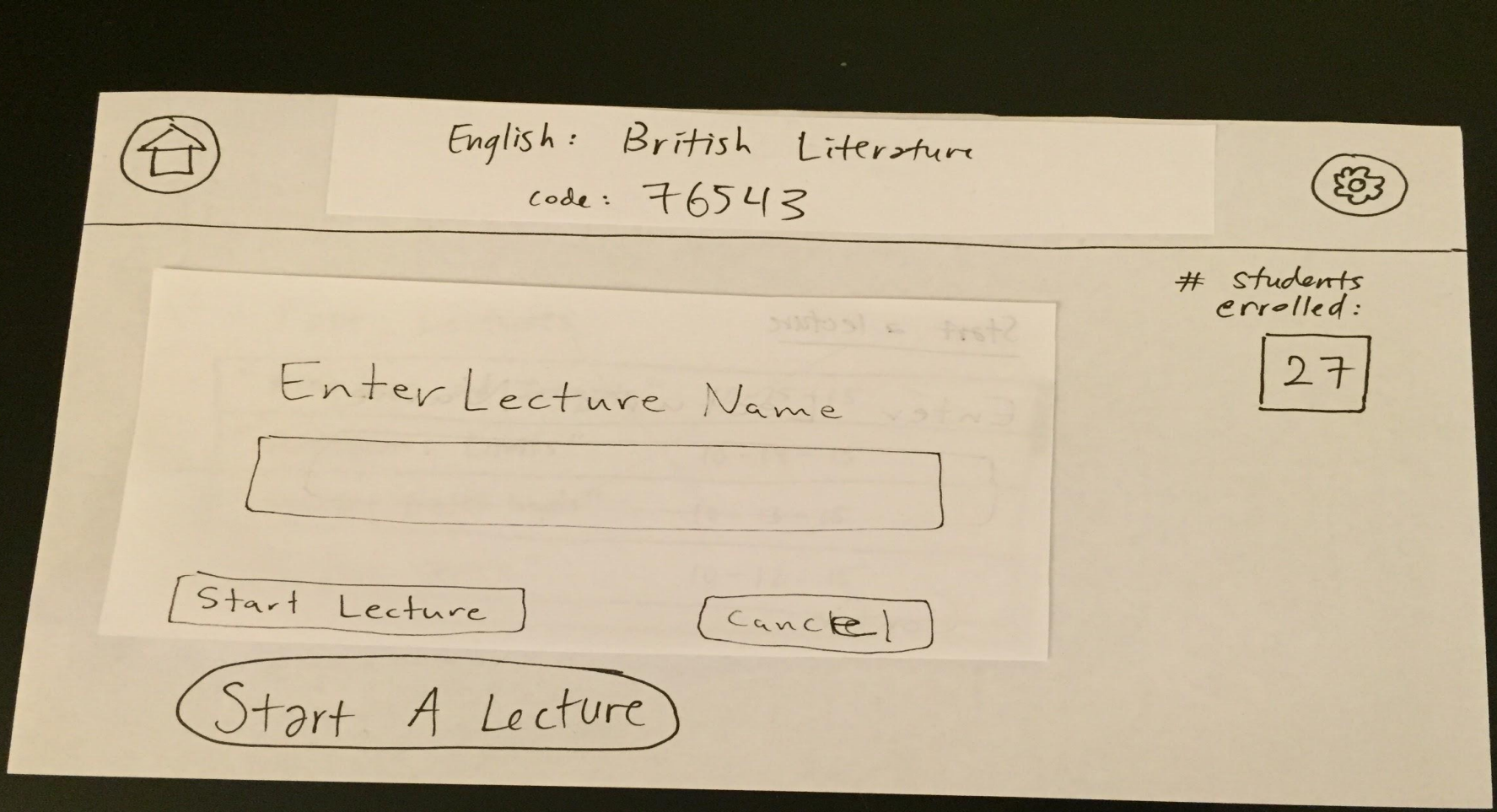
students enrolled:

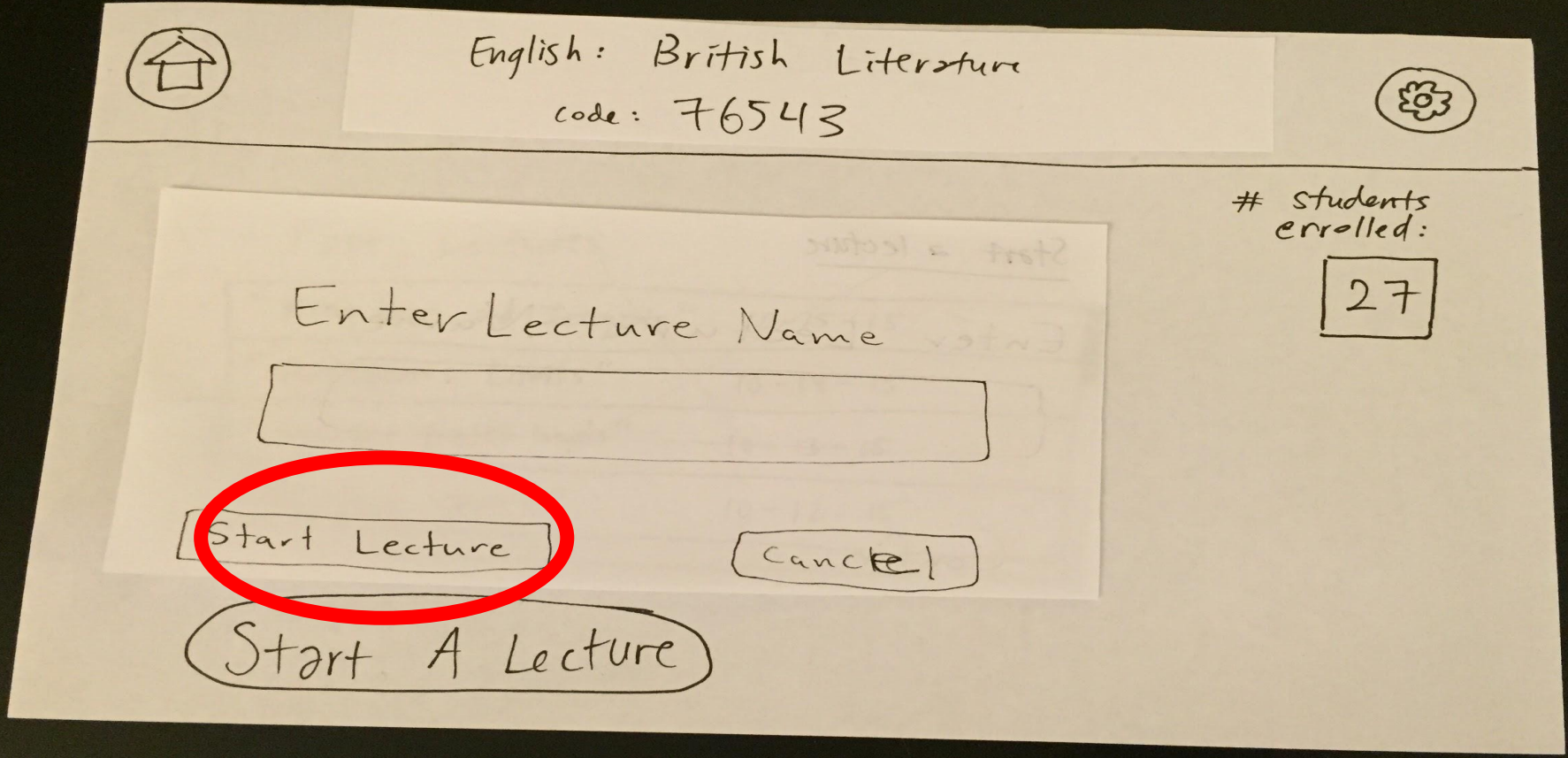
27

Past Lectures

"King Lear and Integrals"	10-15-15
"Shakespeare's Limits"	10-14-15
"Deriving English Words"	10-13-15
"My Fair Series"	10-12-15

Start A Lecture

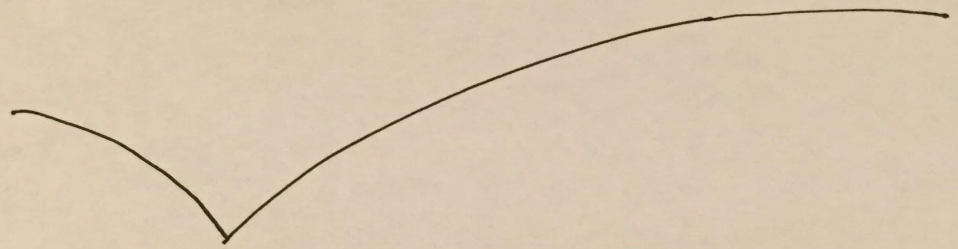

English: British Literature
code: 76543
students enrolled:
27
Enter Lecture Name
Start Lecture
Cancel
Start A Lecture


English: British Literature
code: 76543
students enrolled:
27
Enter Lecture Name
Start Lecture
Cancel
Start A Lecture

Lecture Title

End Lecture

ALL CLEAR

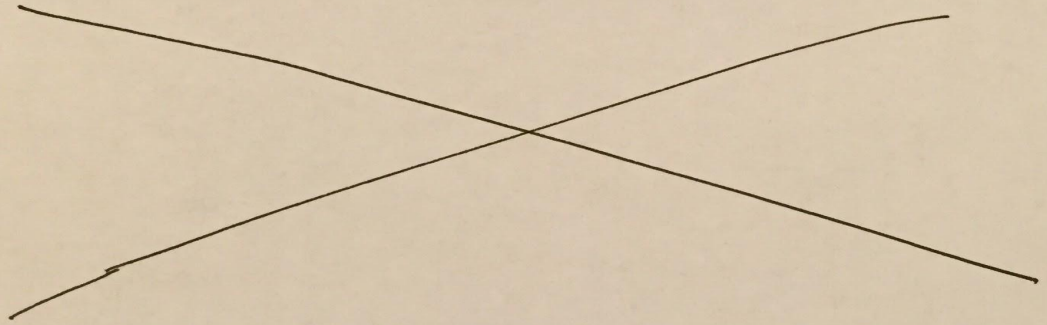


Passively polling students...

Poll Class

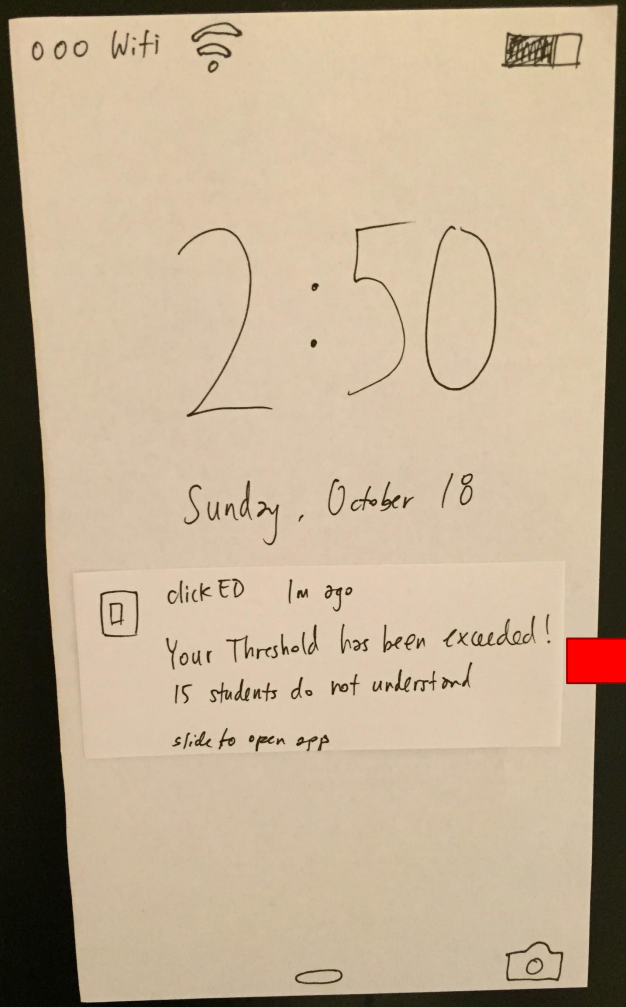
Lecture Title

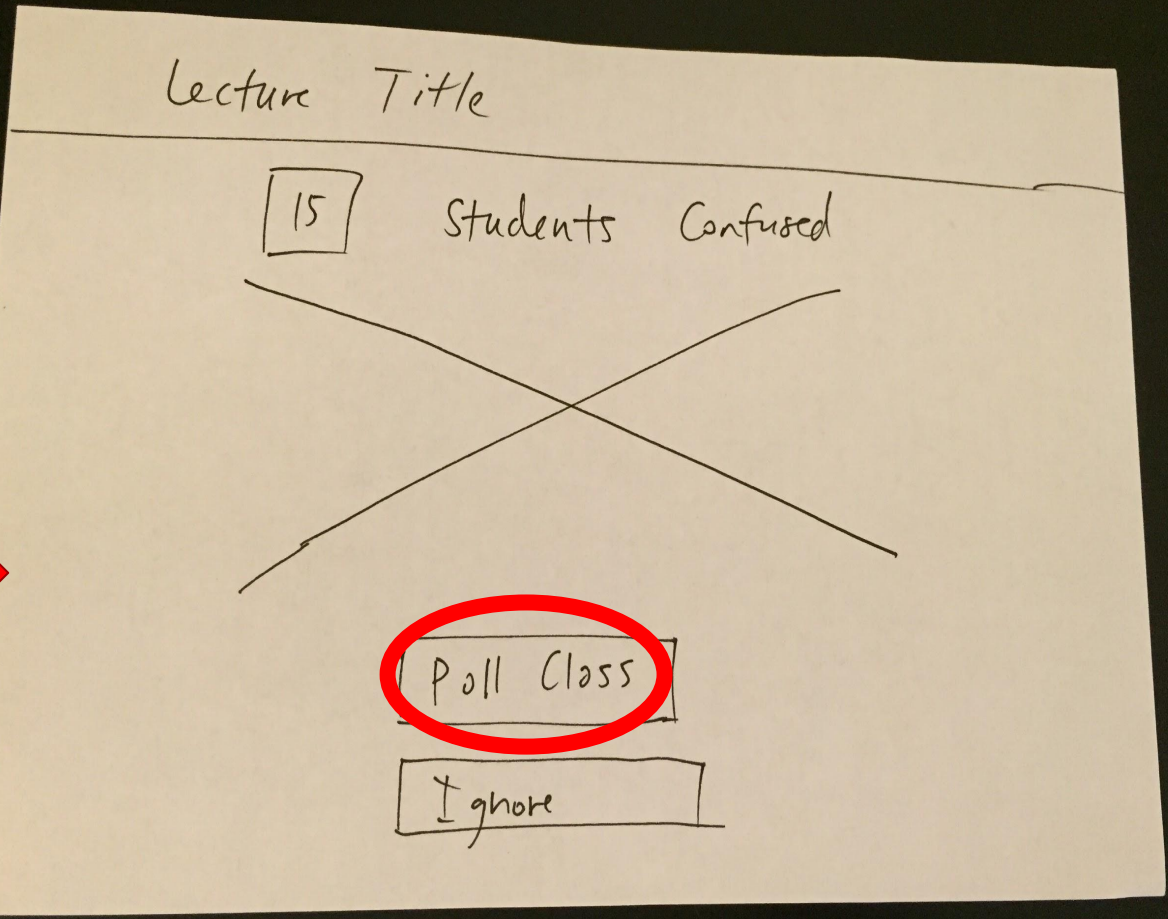
15 Students Confused



Poll Class

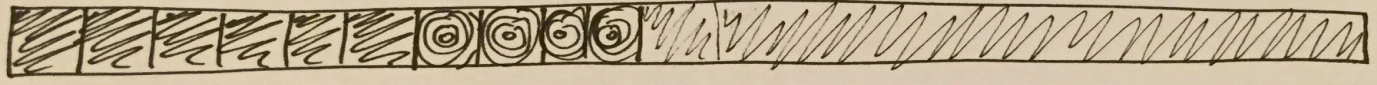
Ignore


ooo Wifi
2:50
Sunday, October 18
clickED 1m ago
Your Threshold has been exceeded!
15 students do not understand
slide to open app


Lecture Title
15
Students Confused
Poll Class
Ignore

Lecture Title

currently: under threshold



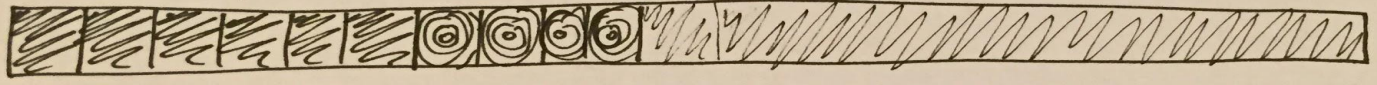
6 students understand

4 students don't understand

Done Polling

Lecture Title

currently: under threshold



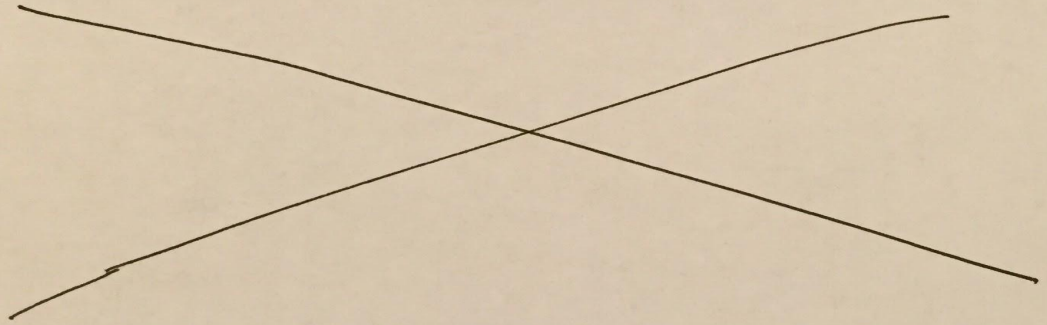
6 students understand

4 students don't understand

Done Polling

Lecture Title

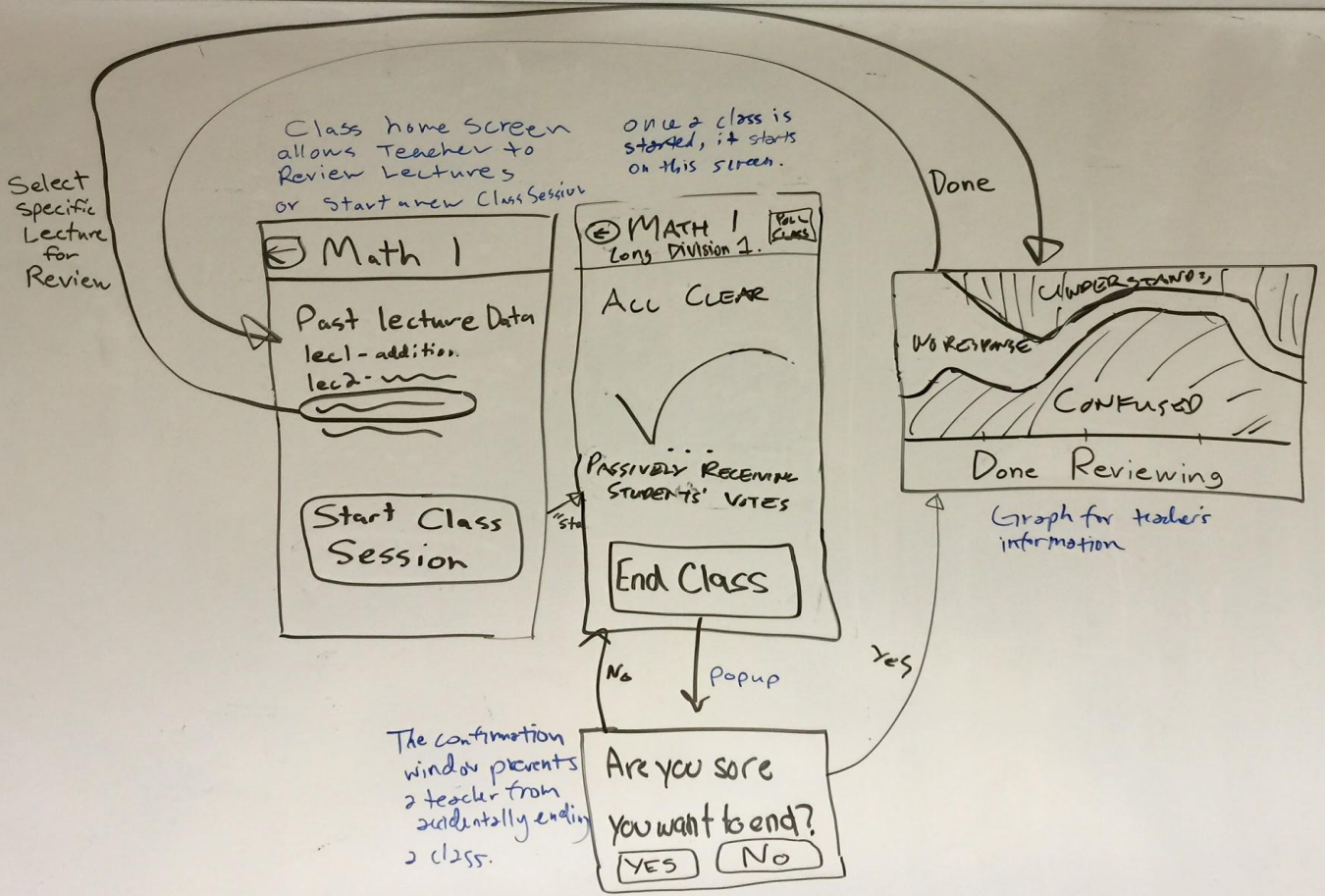
15 Students Confused



Poll Class

Ignore

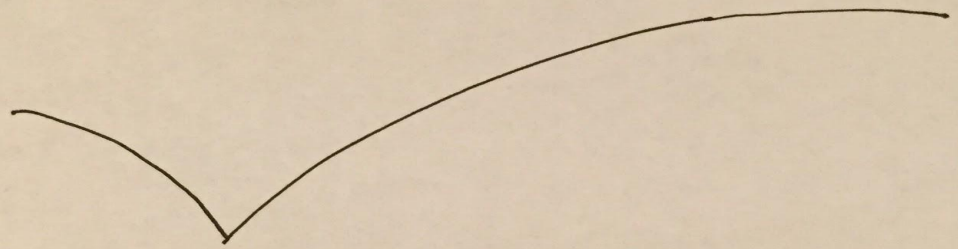
Task 3: Teacher Reviews Lecture



Lecture Title

End Lecture

ALL CLEAR



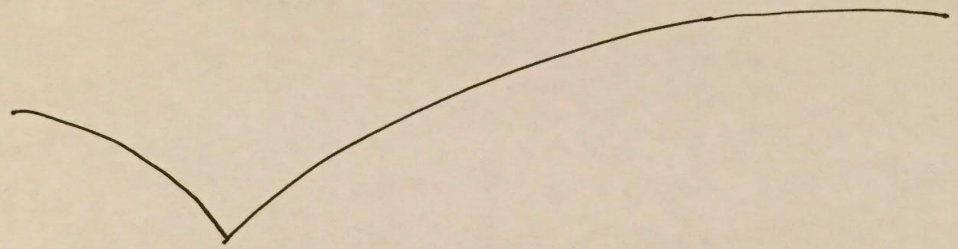
Passively polling students...

Poll Class

Lecture Title

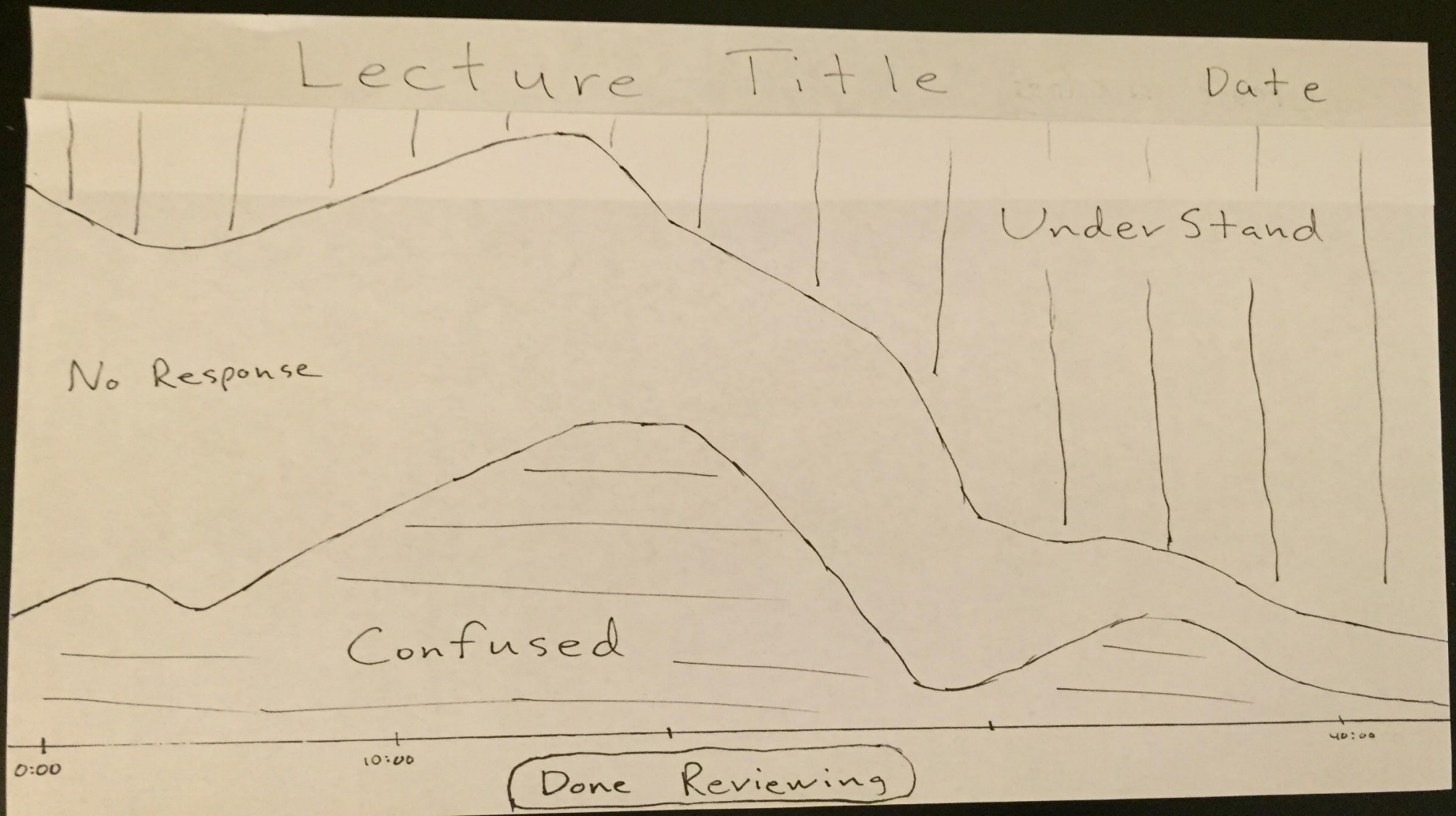
End Lecture

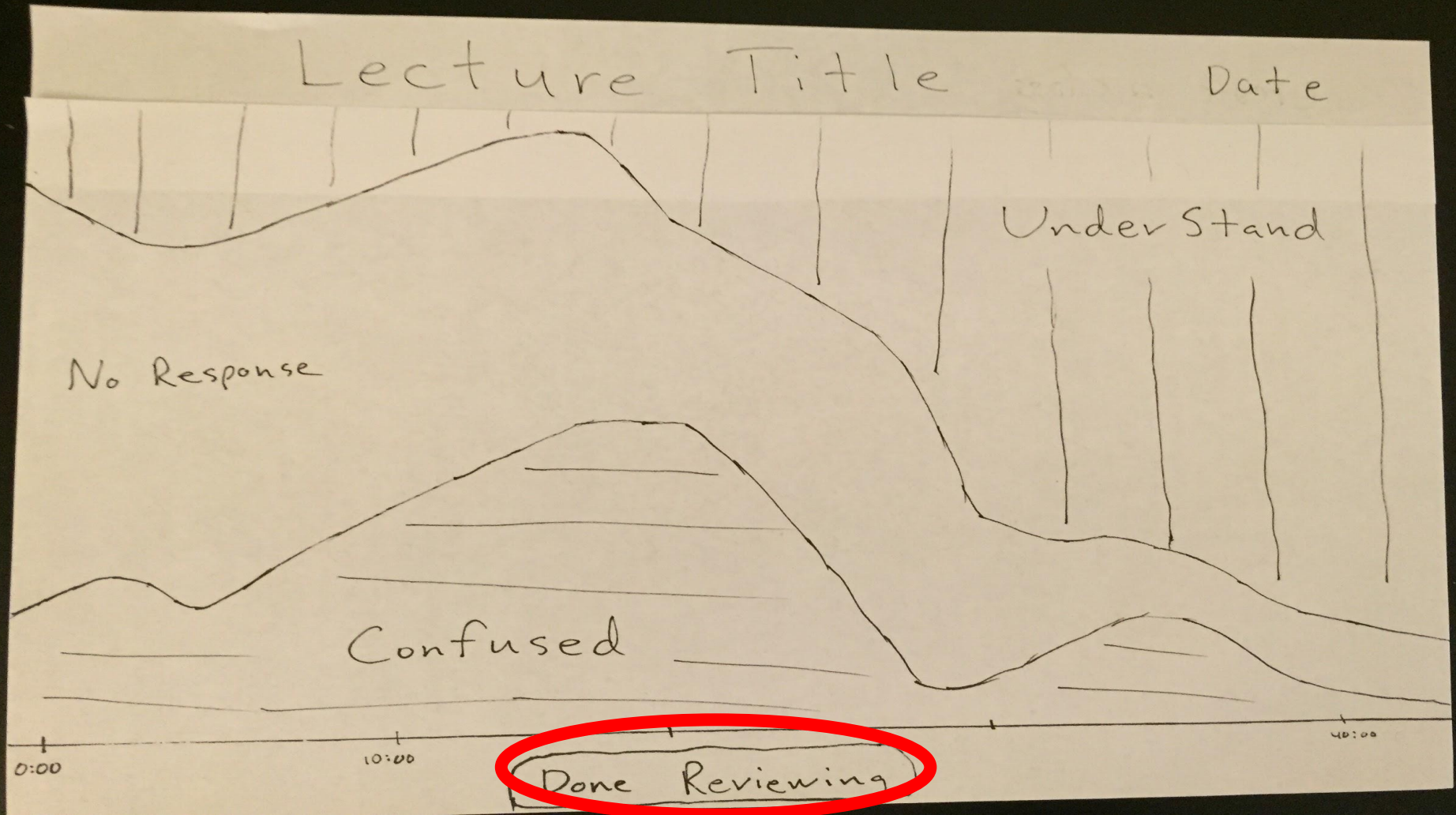
ALL CLEAR



Passively polling students...

Poll Class


Lecture Title
Date
Under Stand
No Response
Confused
0:00
10:00
40:00
Done Reviewing


Lecture Title
Date
Under Stand
No Response
Confused
0:00
10:00
40:00
Done Reviewing

English: British Literature

code: 76543

students enrolled:

27

Past Lectures

"King Lear and Integrals"	10-15-15
"Shakespeare's Limits"	10-14-15
"Deriving English Words"	10-13-15
"My Fair Series"	10-12-15

Start A Lecture

English: British Literature

code: 76543

students enrolled:

27

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"Shakespeare's Limits"	10-14-15
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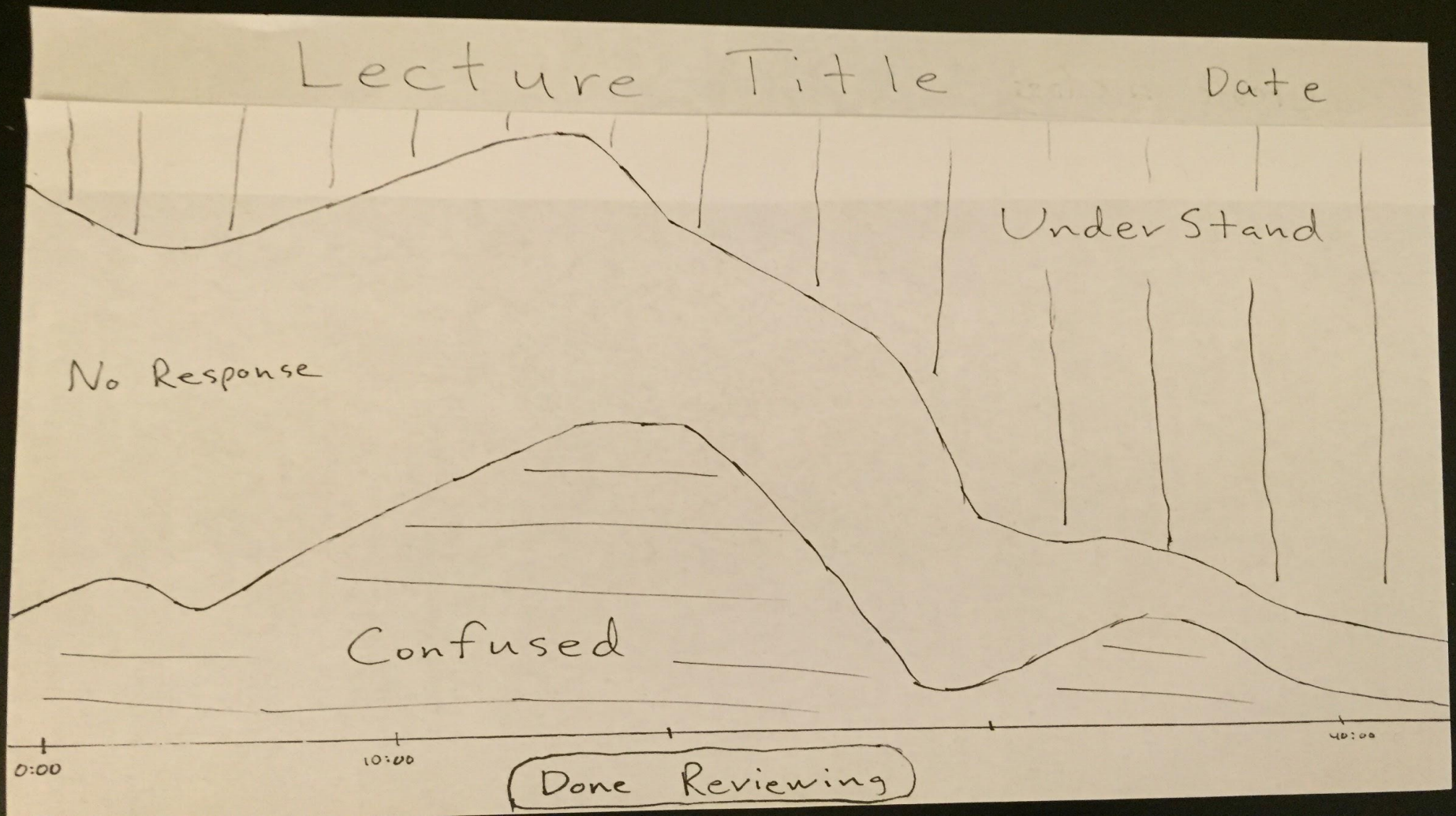
Start A Lecture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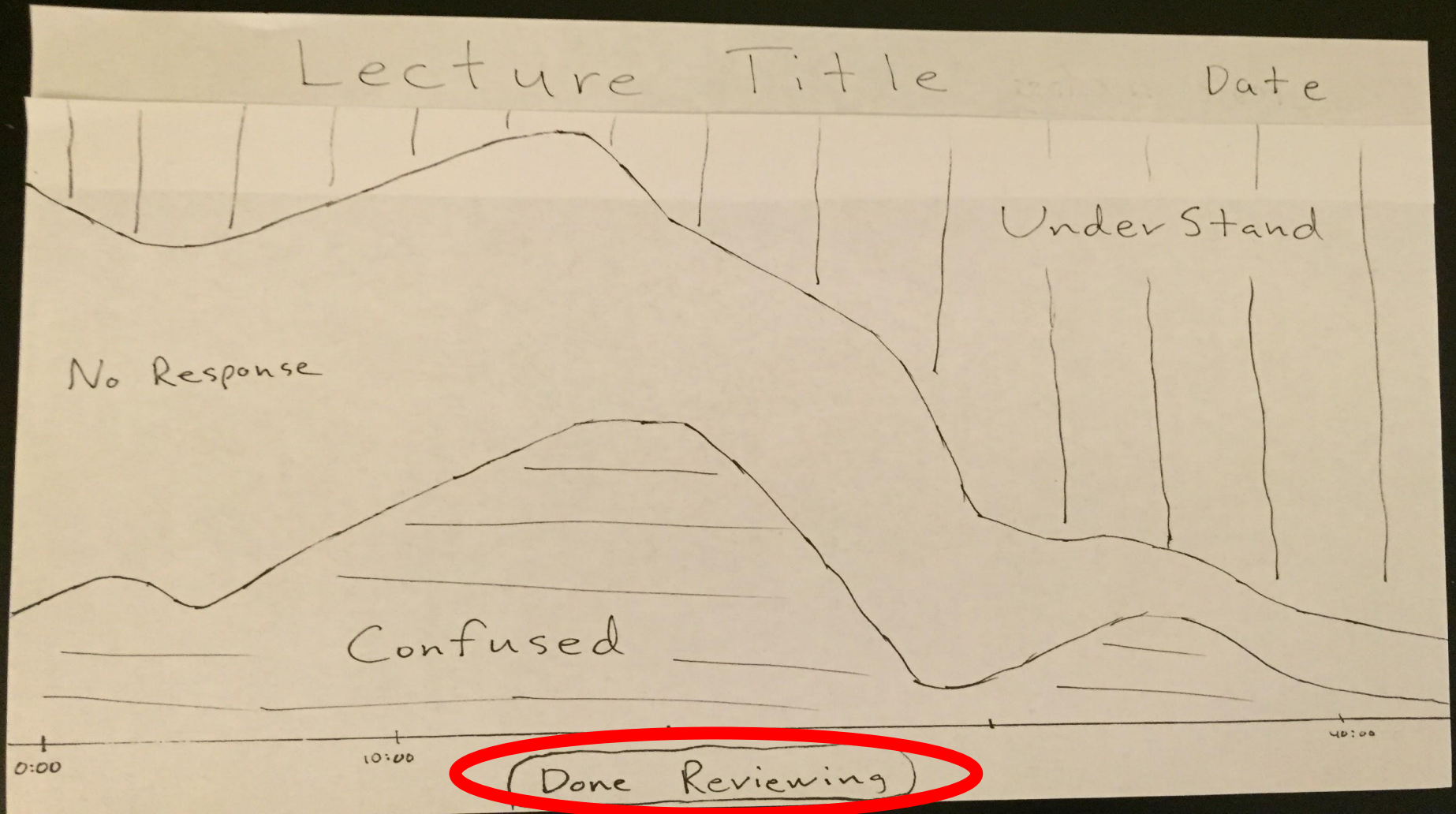
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Start A Lecture

Overview of Talk

1. Brainstorming and picking between possible devices and UIs
2. Narrowing UI flow for each task
3. Constructing prototype for tasks and necessary functionality
4. User experimentation and feedback

Experimental Method

Participants:

- Teachers who used iPads Frequently
- Teachers who didn’t
- Students who didn’t mind speaking up in class
- Students who did

Environment: Teacher’s Office, Teachers’ Lounge, Library

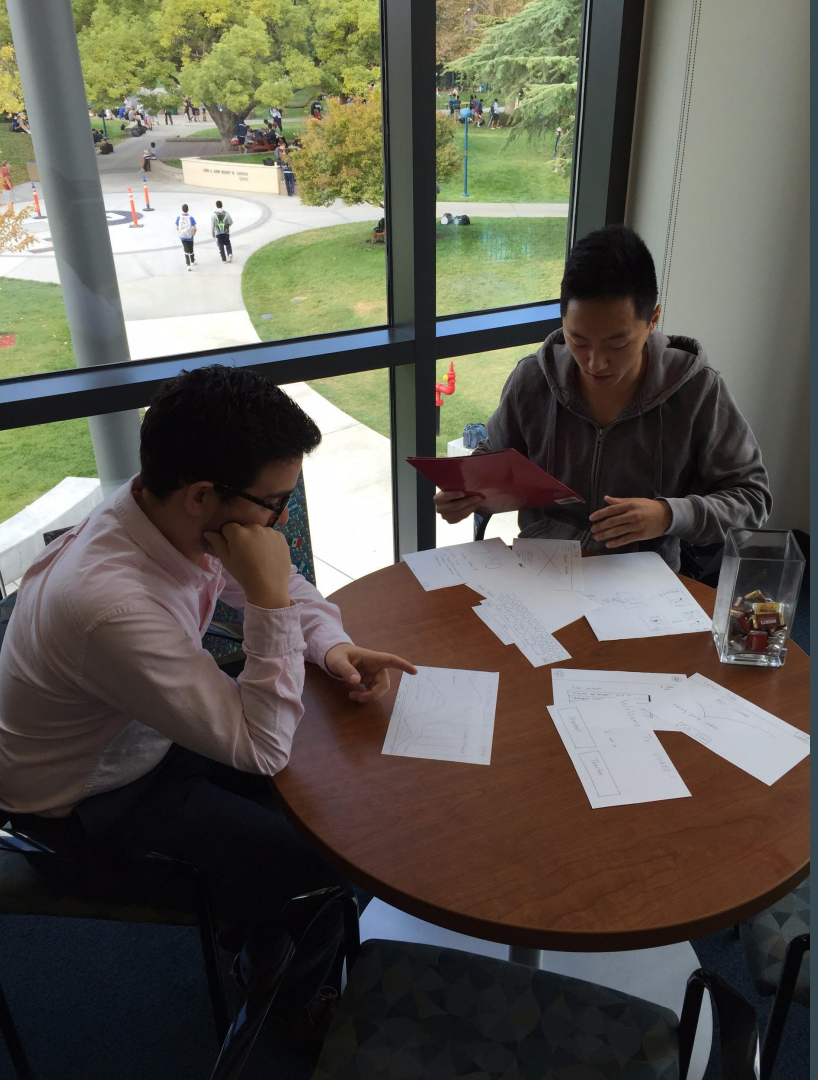
Experimental Method Continued...

Procedure:

- Gordon facilitated, but said little during tasks
- Michael acted as the computer
- Jake took notes

Test Measurements:

- Number and severity of errors
- Time to complete
- Demonstrated interest and usefulness [subjective]



Interview 1 - Teacher

Subject 3 - Spanish Teacher

- Slow with navigation
- Confused on lecture-running slide (“All Clear” slide)
- Couldn’t get much useful information out of graph

Suggested UI Changes

- “All Clear” Screen is confusing - Clarify purpose in app
  - e.g. give a tutorial with explanations

- “Don’t understand” button insufficient - specific feedback.
  - e.g. let students input what topic they are confused about

- Remove “Class Code” Screen - unnecessarily confuses teacher

Interview 2 and 3 - Teachers

Subject 1 - Religious Studies Teacher

- Navigated quickly with one error
- Got minor information from graph

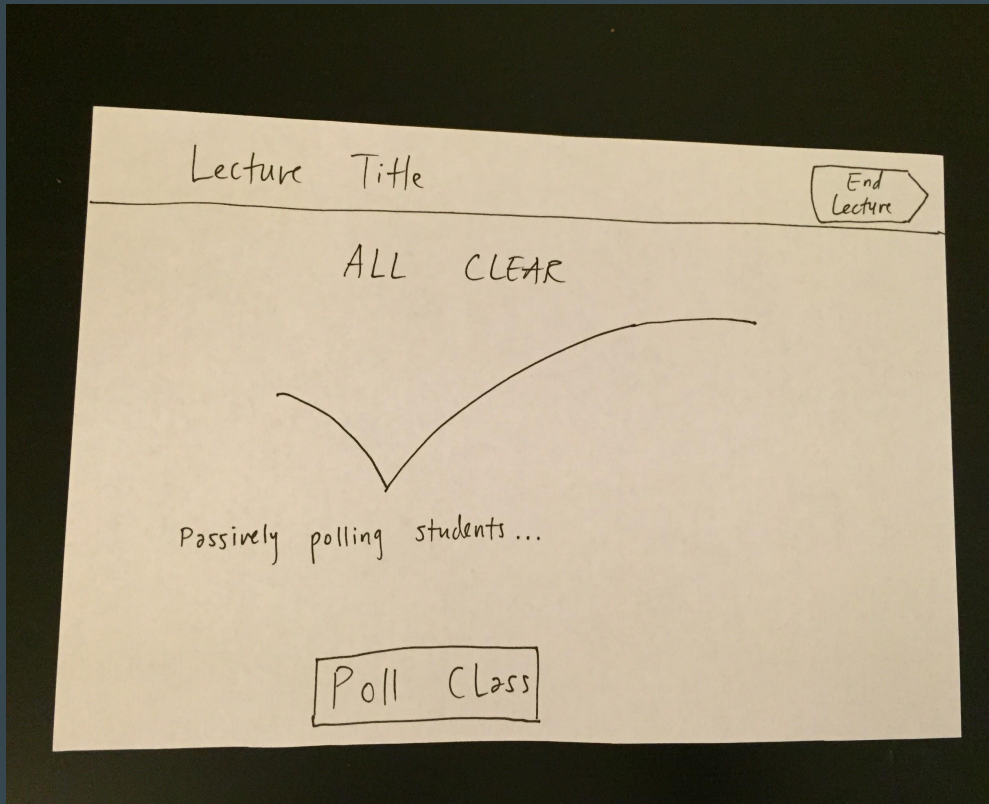
Subject 2 - History Teacher

- No errors, modest speed
- Wanted individual student info on the Graph

Suggested UI Changes

- De-anonymize students so can get more info in graph
- Don't call it "lecture"
- Allow flexible polling - e.g. allow teacher to create a "one question quiz"

Single largest cause of confusion:



Interview 4 and 5 - Students

Subject 4 - active student

- Fast, no errors
- Said useful for others

Subject 5 - passive student

- Fast, no errors
- Hesitate to give feedback

Suggested UI Changes

- Anonymous during class - students didn't want to get "checked on" during class

- De-Anonymize after class - both students agreed this would be fine with students, and useful for teachers

- Let students be specific - let students say specifically where they got lost

Overview of Talk

1. Brainstorming and picking between possible devices and UIs
2. Narrowing UI flow for each task
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4. User experimentation and feedback

Overview of Talk - End

5. Feedback or Questions?