Fully Integrating Remote Students into a Traditional Classroom using Live-Streaming and TeachBack

FIE 2016

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OUTLINE

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Summary

Studying the effects and feasibility of adding optional remote attendance to a class using

- Synchronous interactive experience for both remote and F2F students
  - Echo360: live-streaming of class meetings
  - TeachBack: Web-based class-wide interactions

Research Interests:

- F2F class attendance/absenteeism
- Learning outcomes and styles
- Use of class resources - lecture recordings
- Feasibility and perspectives

Background & Motivation

- Traditional instructional model (same time and place) is still dominant
  - Unbounded avenues of F2F and real-time interactions and communications
- Growth and adoption of remote and distance education
  - Changing styles and needs of learners and teachers
  - Advancement of IT

TOOLS USED

Echo360 & TeachBack

Echo360 { echo360.com }

- Echo360 Lecture Capture System
- Fitted in select lecture halls at Brandeis University
  - Recording Recording
  - Live-Streaming
  - Archiving and Later VOD
- There are alternative streaming/recording products

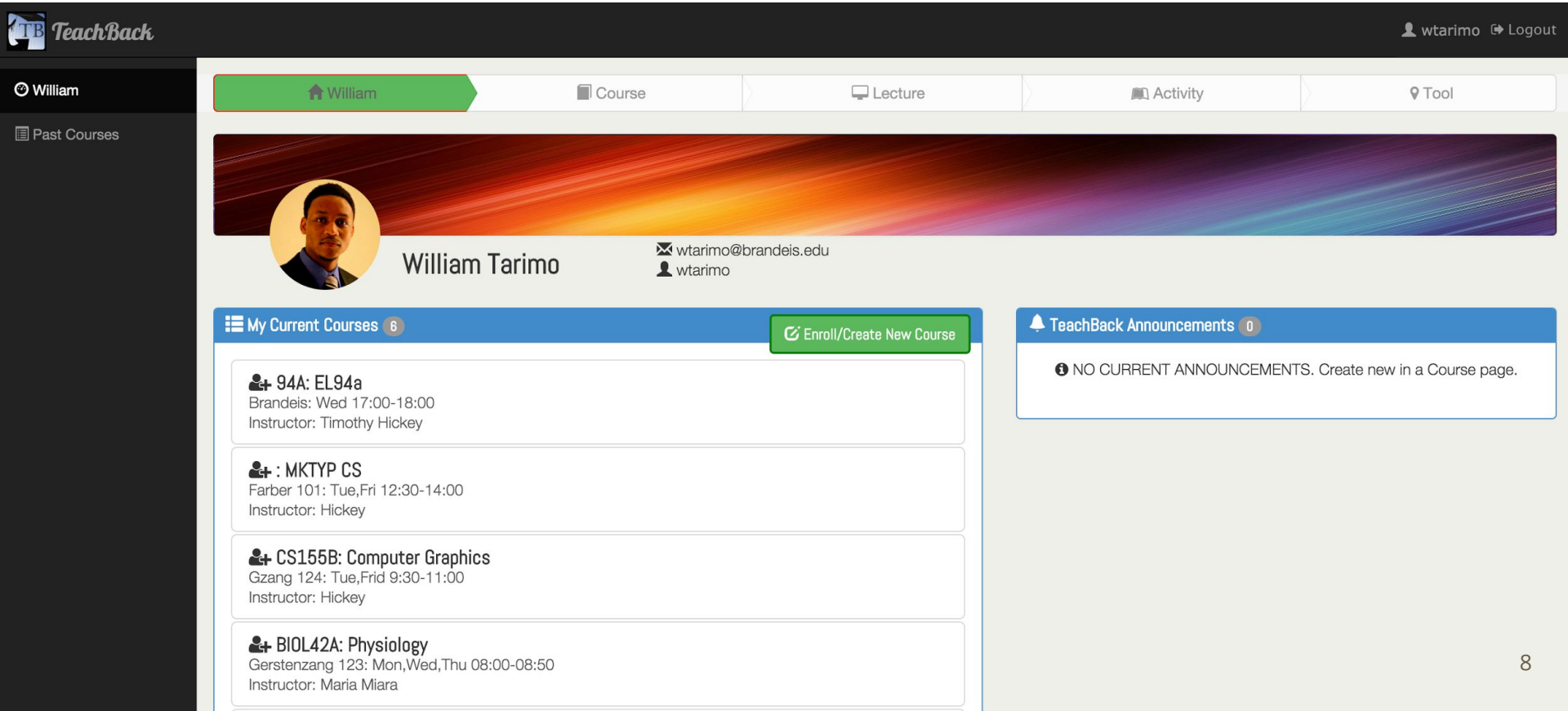
TeachBack

- an in-classroom web application designed to support active and interactive learning and teaching activities

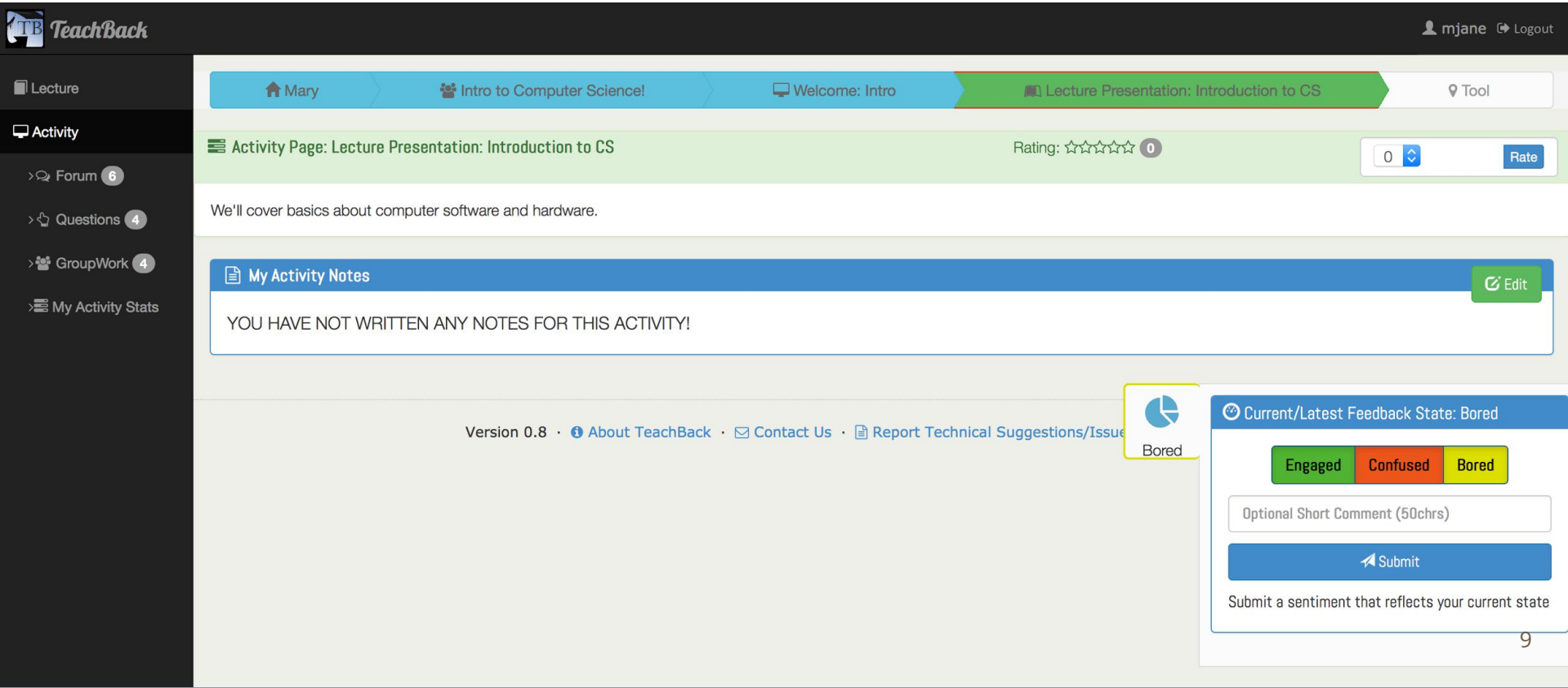
Main features:

- Questions - a clicker-style ARS
- Feedback - a rapid feedback mechanism
- Forum - a monitored in-class help & discussion forum
- GroupWork - a clicker-style Think/Pair/Share assessment system
- Stats - students participation and assessment stats
- + Others

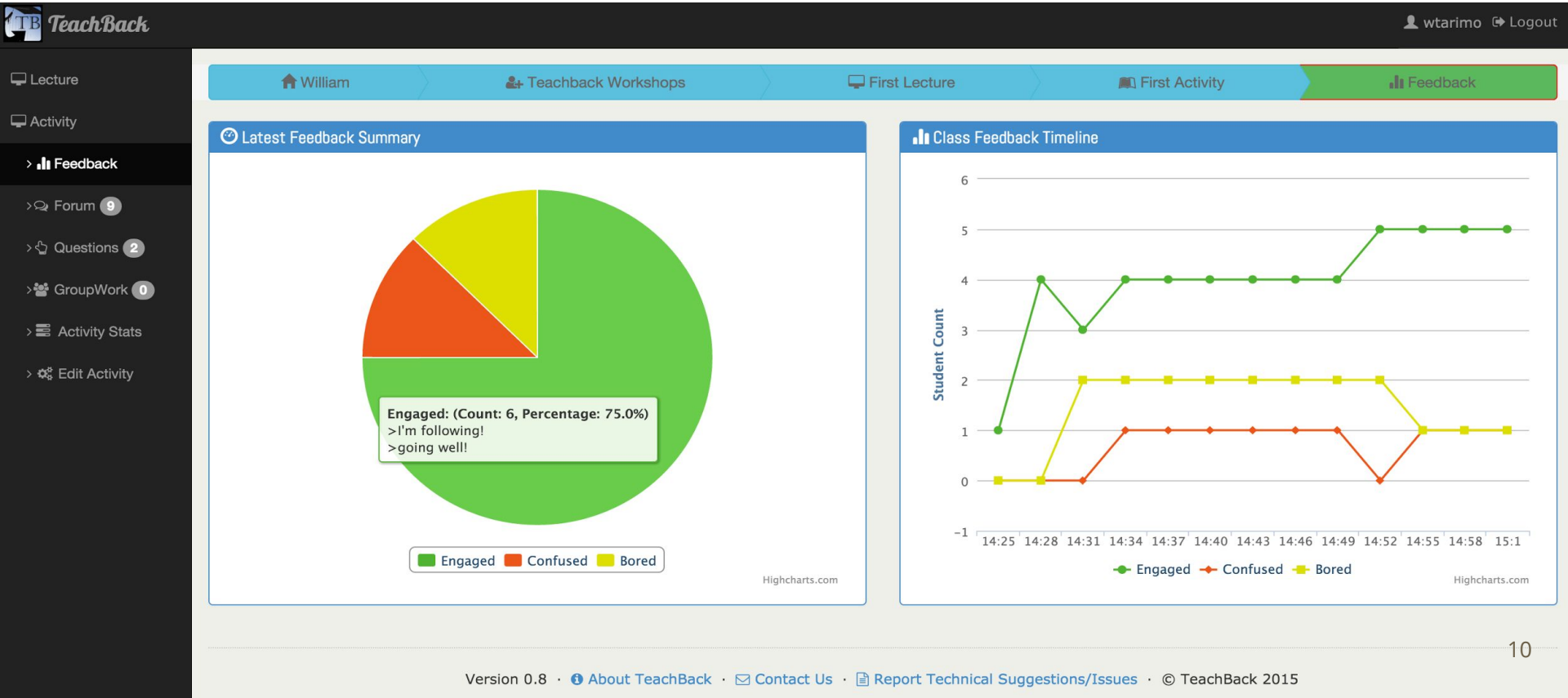
User Account



Feedback - Student View

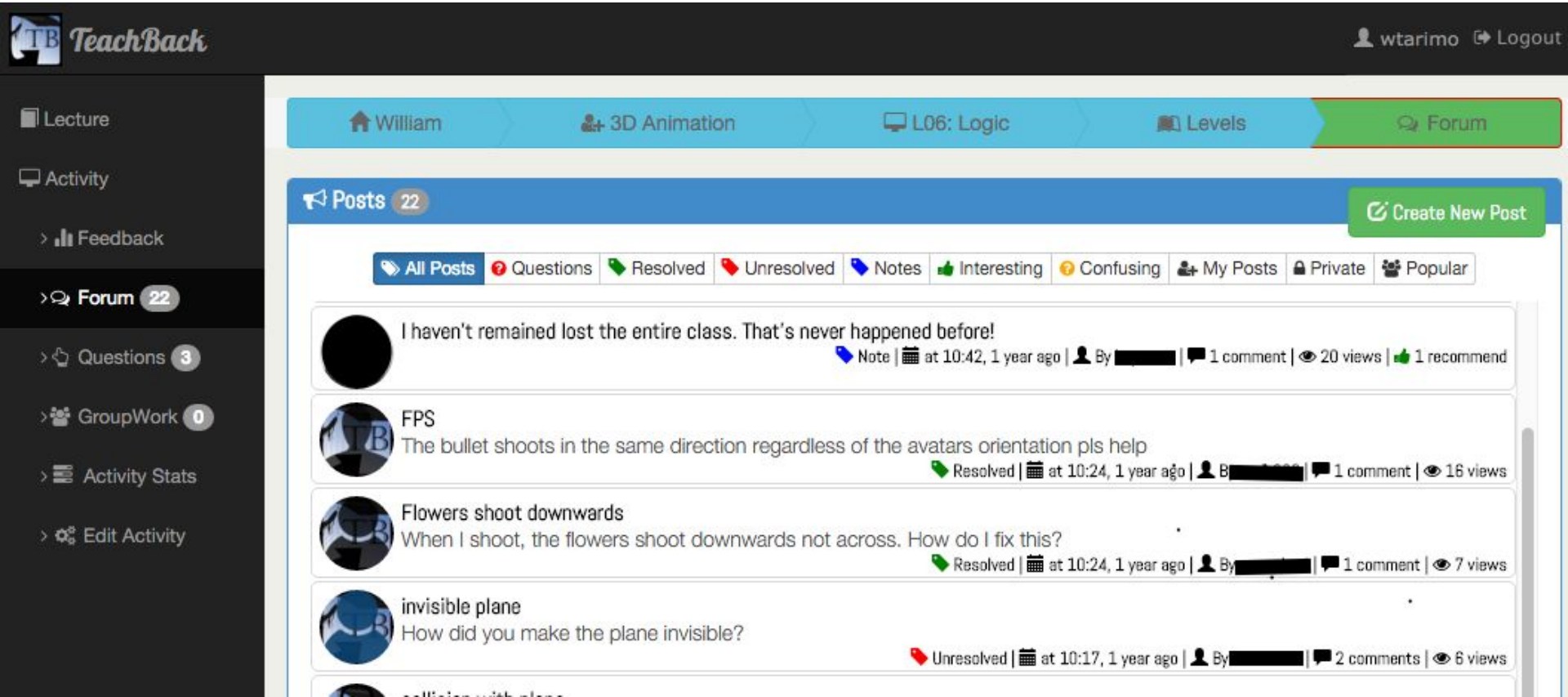


Feedback - Instructor

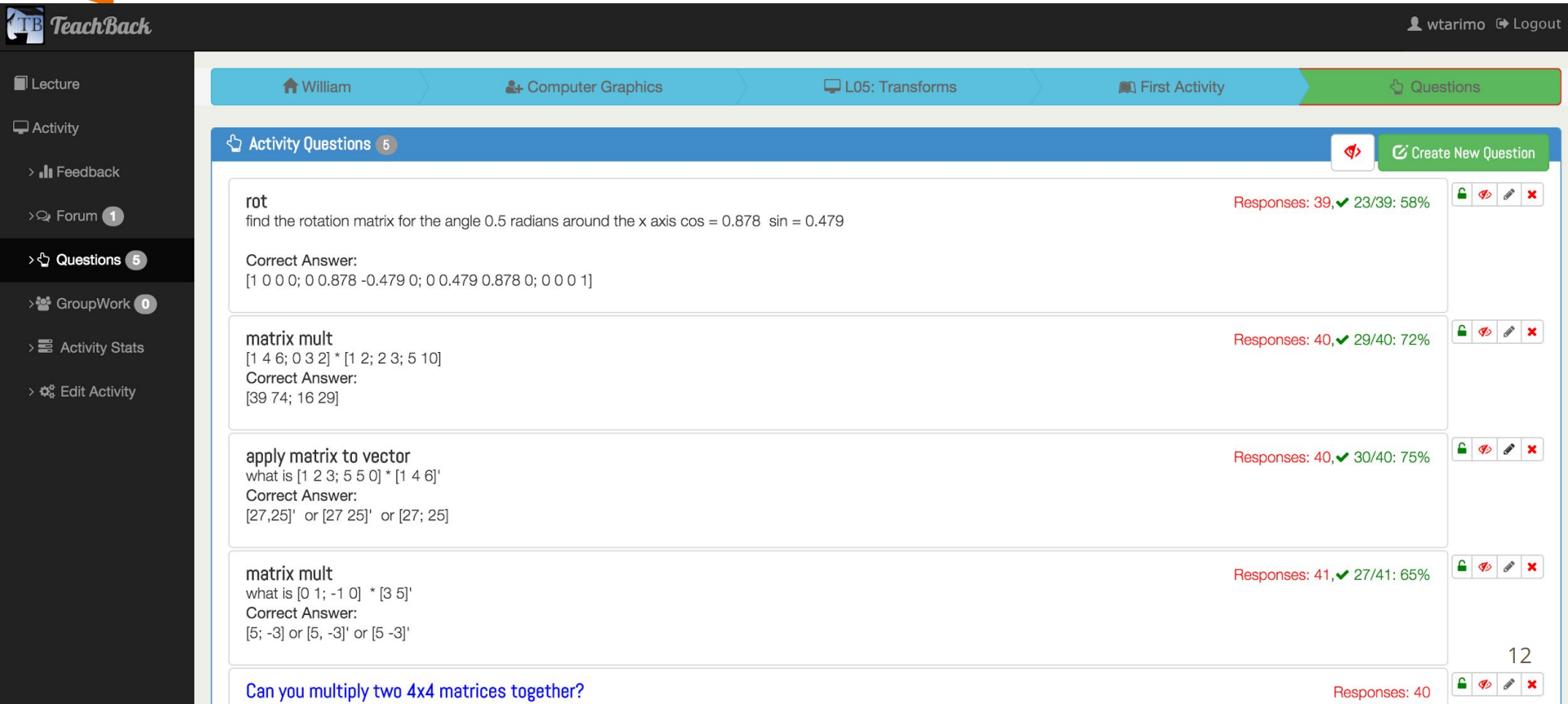


Version 0.8 · About TeachBack · Contact Us · Report Technical Suggestions/Issues · © TeachBack 2015

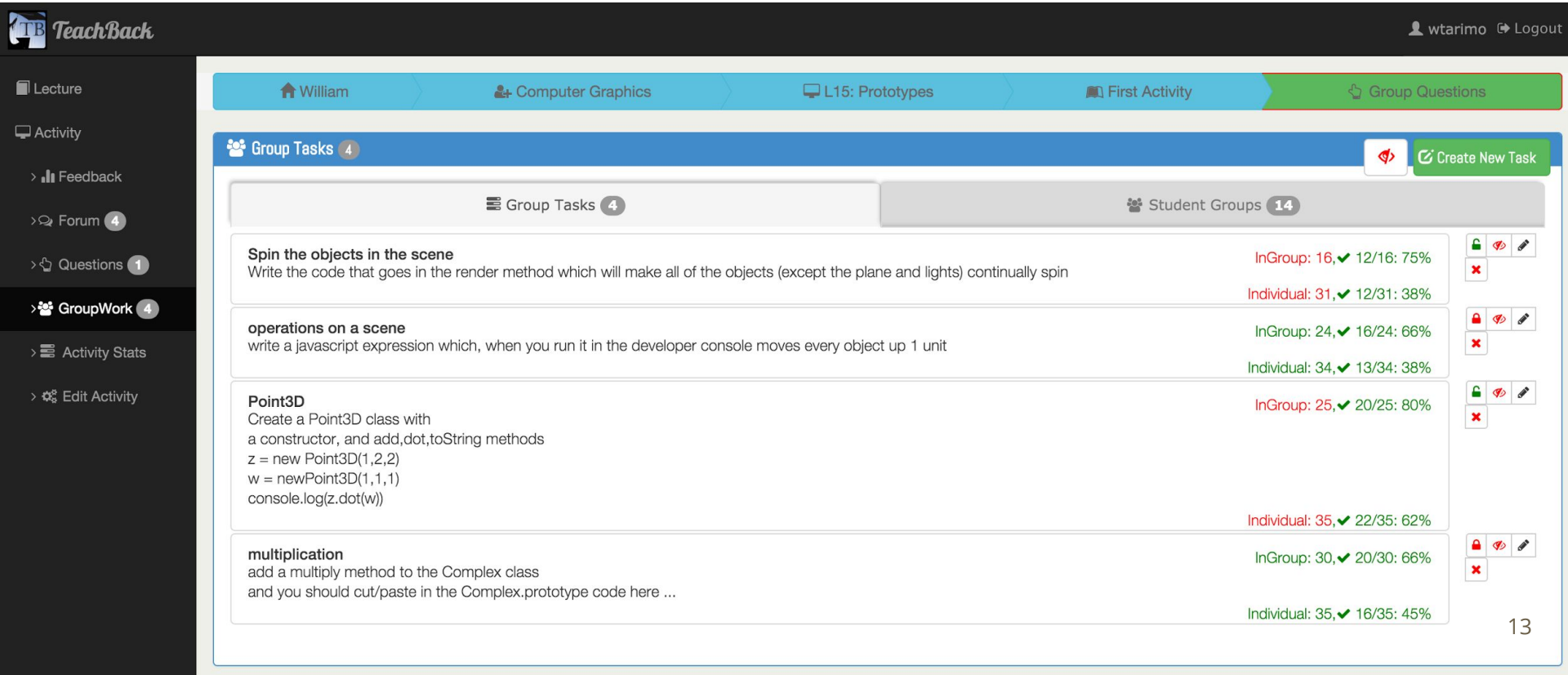
Forum


TeachBack
wtarimo
Logout
Lecture
Activity
Feedback
Forum 22
Questions 3
GroupWork 0
Activity Stats
Edit Activity
William
3D Animation
L06: Logic
Levels
Forum
Posts 22
Create New Post
All Posts
Questions
Resolved
Unresolved
Notes
Interesting
Confusing
My Posts
Private
Popular
I haven't remained lost the entire class. That's never happened before!
Note | at 10:42, 1 year ago | By [redacted] | 1 comment | 20 views | 1 recommend
FPS
The bullet shoots in the same direction regardless of the avatars orientation pls help
Resolved | at 10:24, 1 year ago | By [redacted] | 1 comment | 16 views
Flowers shoot downwards
When I shoot, the flowers shoot downwards not across. How do I fix this?
Resolved | at 10:24, 1 year ago | By [redacted] | 1 comment | 7 views
invisible plane
How did you make the plane invisible?
Unresolved | at 10:17, 1 year ago | By [redacted] | 2 comments | 6 views

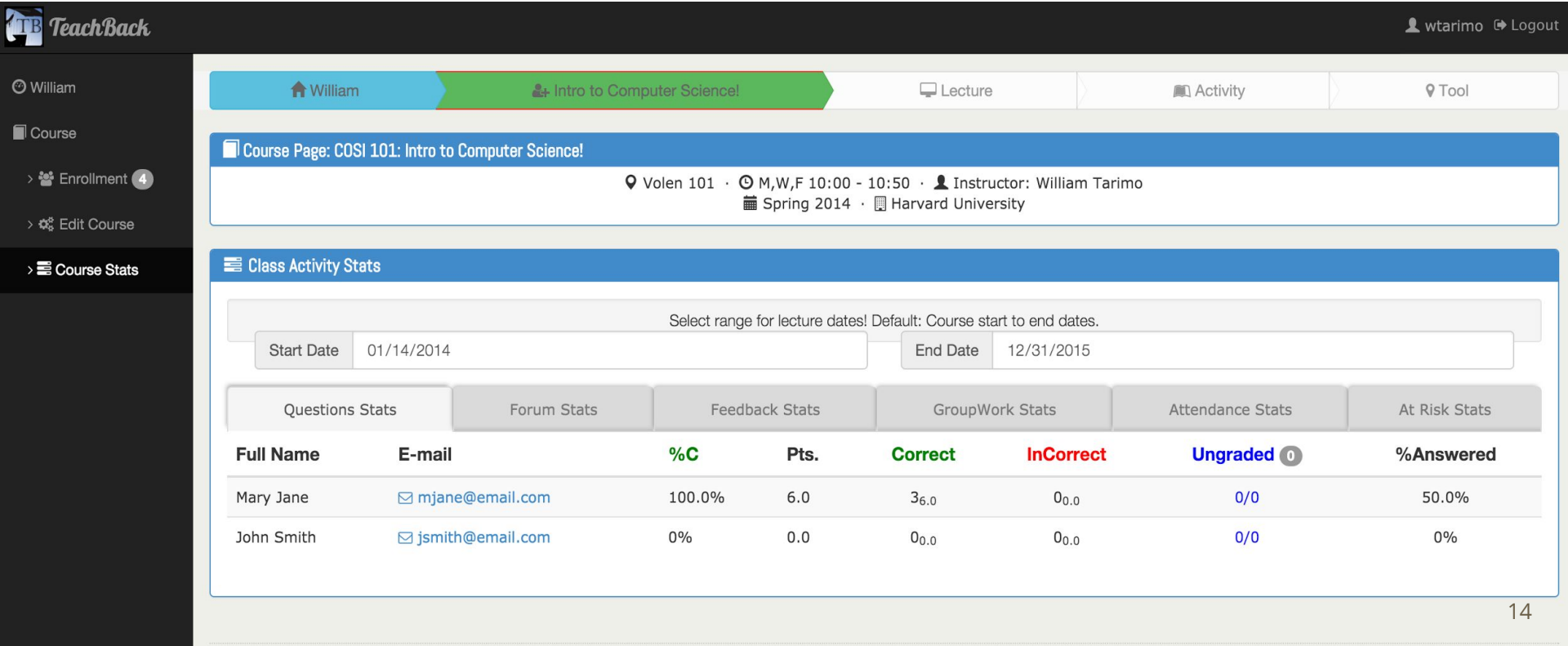
Questions - Instructor View



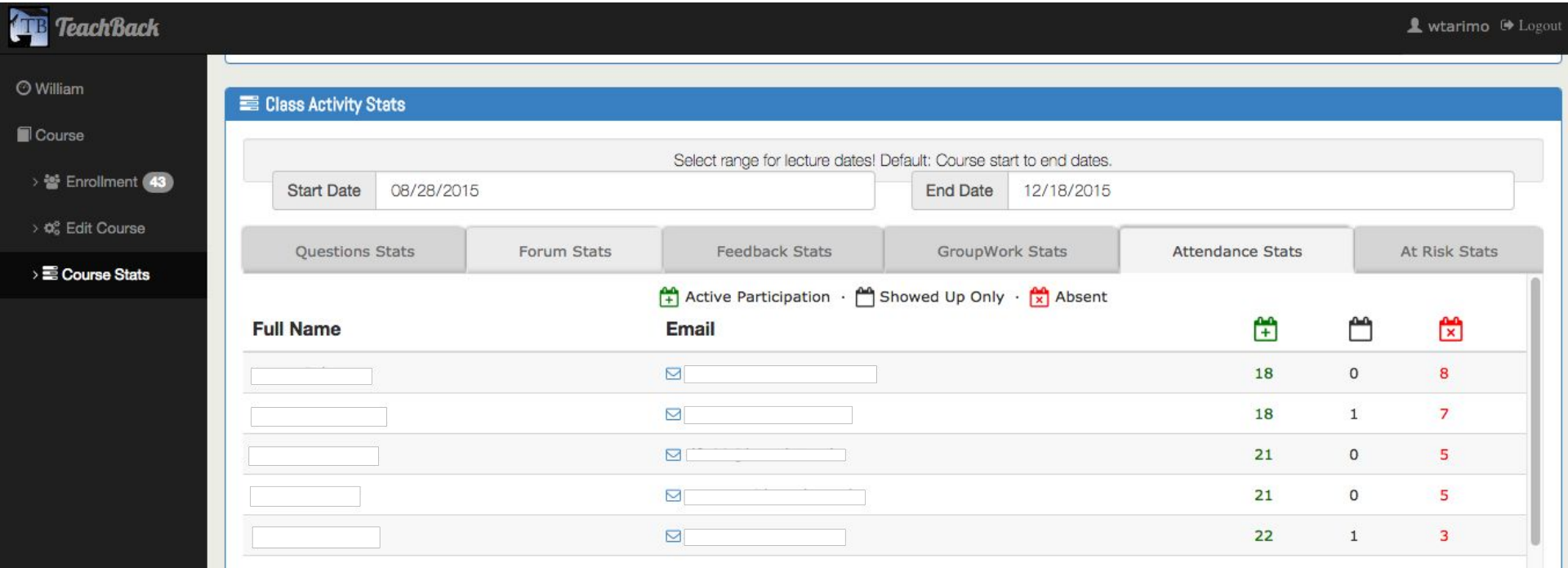
GroupWork - Instructor View



Participation & Performance Stats



Attendance Stats



THE EXPERIMENT

The Experiment

Class: Fall 2015

- Flipped Computer Graphics class - 41 Students.
- 26 Class Meetings
- Offered optional remote attendance from class 11.

Data:

- TeachBack attendance, engagement and performance.
- Echo360 data.
- Final exam and course grades.

RESULTS

Effects on Absenteeism

- Overall class attendance remained the same, counting remote attendance
  - Part 1: 2.9 absentees/day & Part 2: 2.875
  - Part 2: On average /day: 75% physically in class, 18% remote, and 7% absent
  - Anecdotally, more students tend to miss classes towards end of semester

ABSENTEEISM, GROUPED BY NUMBER OF CLASSES MISSED BY STUDENTS DURING PARTS 1 AND 2 OF THE COURSE.

Missed Classes	Students (Part 1)	Students (Part 2)
0	23	17
1	11	12
2	5	8
3	0	2
4	2	0
6	0	2

Student Use of Lecture Recordings

- 72 semester absences > 24 (33.3%) watched recordings of missed classes
  - During Part 1: 35.7%
  - During Part 2: 31.8%, only slightly lower

Student Use of Live-streaming

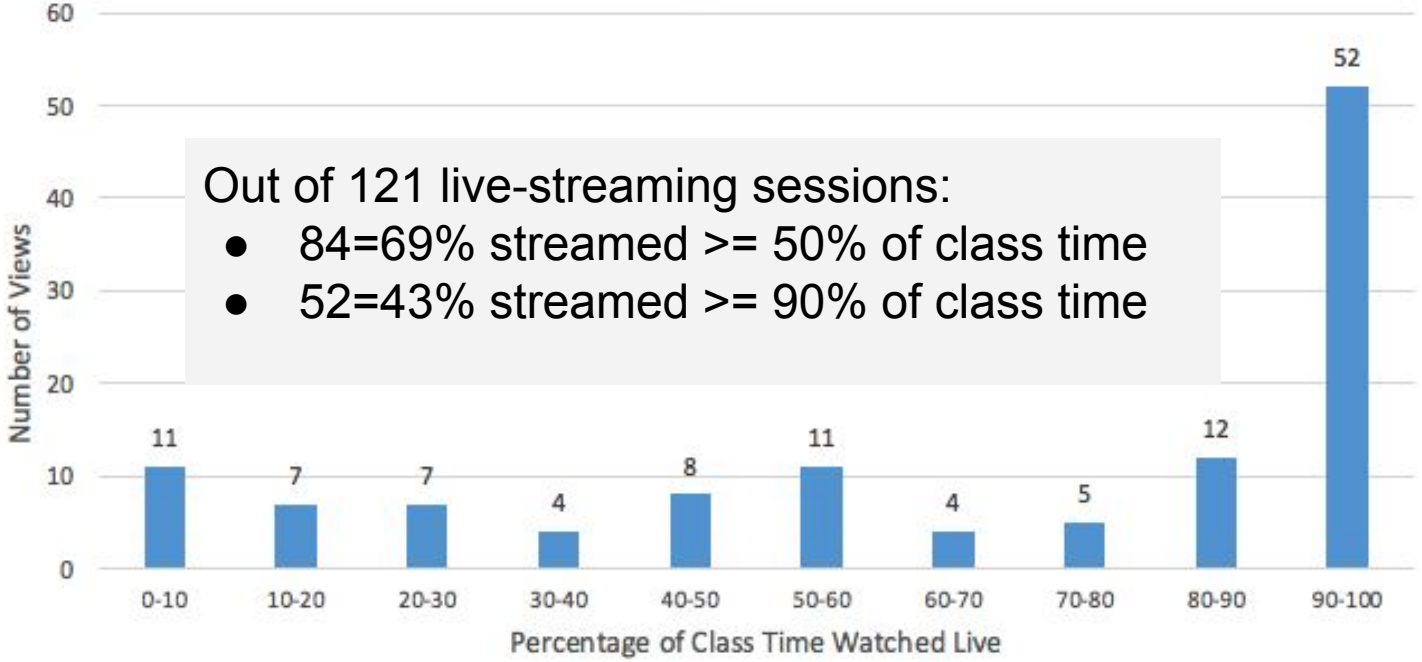
- Students embraced the remote option
- 75% of students tried at least once
- 18% of students tried >50% of the 16 classes

REMOTE ATTENDANCE, GROUPED BY NUMBER OF CLASSES LIVE-STREAMED BY SPECIFIC STUDENTS.

Classes	Students	Percentage of Class
0	10	25%
1	10	25%
2 - 5	14	32%
7 or More	7	18%

Student Use of Live-streaming

- Students were committed to streaming-lectures while remote



Effects on Learning Outcomes

- Has insignificant effect on course performance compared to absenteeism

LINEAR REGRESSION ANALYSIS: MODIFIED COURSE GRADE VS. ABSENTEEISM AND REMOTE ATTENDANCE.

Item	R^2	P-Value	Coefficient
Remote Attendance	0.011	0.519	-0.261
Absenteeism	0.211	0.00283	-2.081

Effects on Learning Outcomes

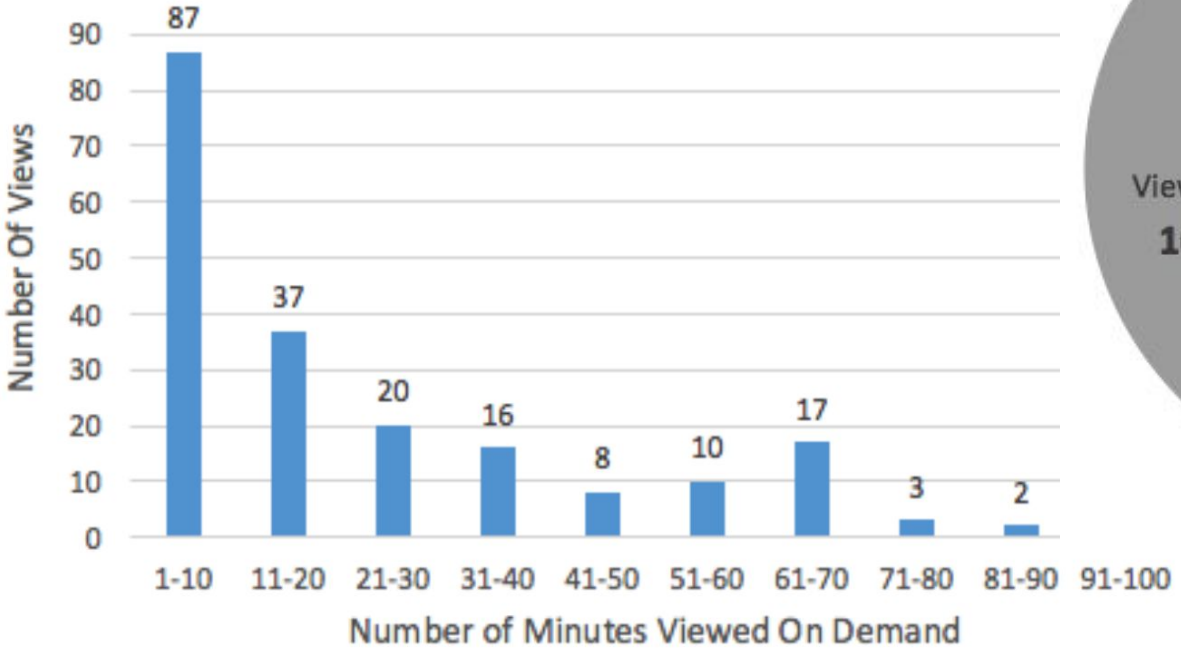
- Has insignificant effect on participation grade compared to absenteeism

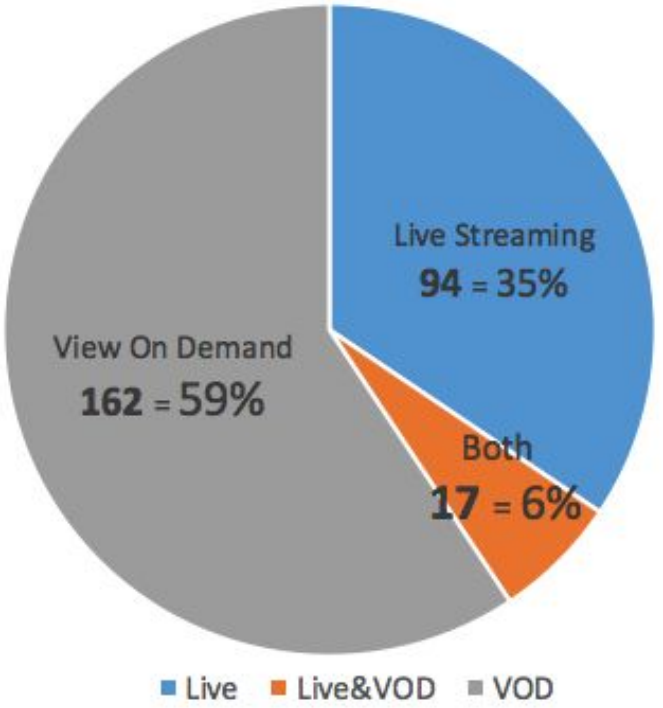
LINEAR REGRESSION ANALYSIS: CLASS PARTICIPATION GRADE VS. ABSENTEEISM AND REMOTE ATTENDANCE.

Item	R^2	P-Value	Coefficient
Remote Attendance	0.0156	0.441	-0.476
Absenteeism	0.435	0.0000036	-4.568

Use of Lecture Recordings

- Popular resource for both remote and face-to-face attendees





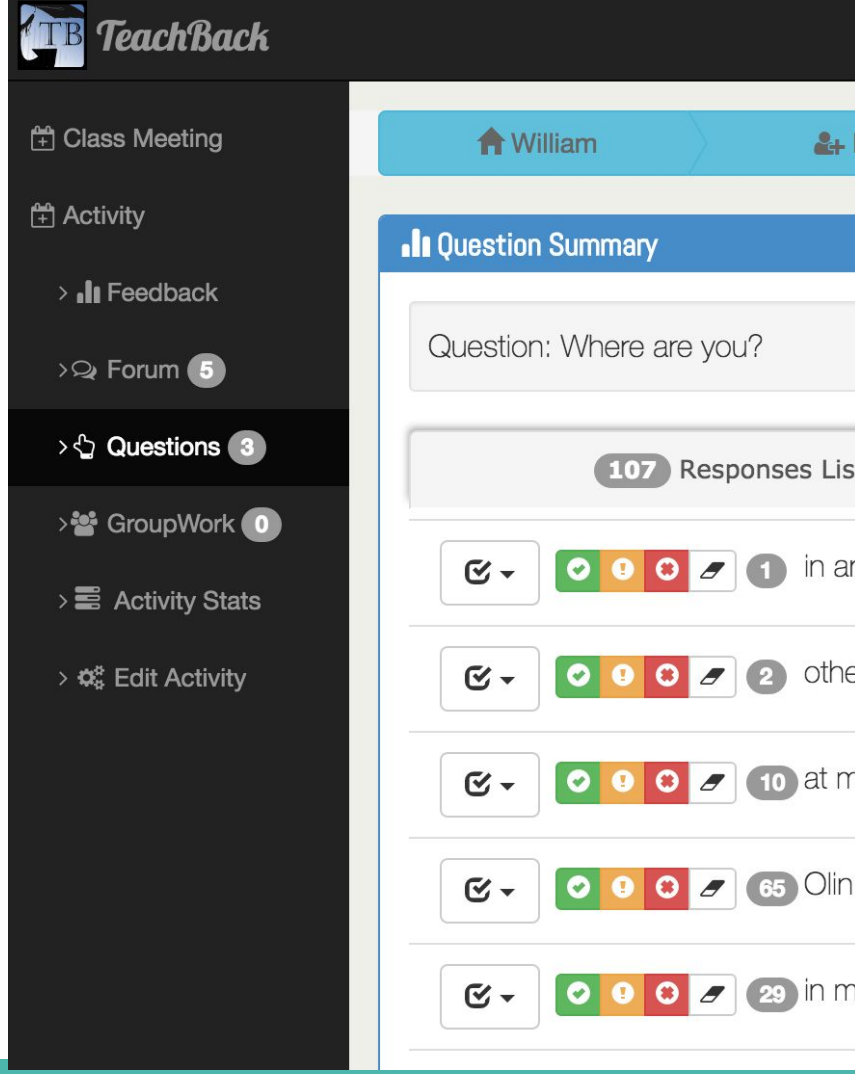
Student Opinions

1. 51.5% - All or most courses at university should have the option
2. 30.6% - Just as effective or more, 50% thought it was inferior, 19.4% Didn't try the option
3. on scale [1, 5], 87.2% rated TeachBack as effective at 3-5
4. on scale [1, 5], 79.4% rated Echo360 as effective at 3-5.
    a. Amid poor video quality complaints
5. Comments: Convenience, Anywhere attendance, Valuable Alternative
    a. Risk of poor concentration.
    b. Depended on good connection.
    c. Better as an option.
    d. Separate TeachBack groupings.
    e. Good when not abused.

CURRENT & FUTURE WORK

Current Work

- A second run in **Introduction to 3D Animation** - Fall 2016
- 153 Students
- About ⅓ of the class attending remotely
  - ≅45 students/class



THE END!

Thank You!

Time For Questions

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{ teachback.herokuapp.com }

From Fall 2014

- 1,697 Unique Users
- 64 Courses
- 202 Student Notes
- 1,086 Questions
- 41,135 Question Answers
- 2,260 Course -Enrollments
- 374 Class Meetings
- 413 Class Activities
- 105 GroupWork Tasks
- 3,875 Task Responses
- 1,140 Forum Posts
- 6,730 Forum Comments
- 10,723 Feedback Records