Teaching Upper Level Statistics Courses through a Shared/Hybrid Model

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Women in Statistics and Data Science 2017

Overview

LACOL

The Liberal Arts Consortium for Online Learning

Motivation

- Share classes to supplement and keep small liberal arts flavor
- Expand advanced level offering

Implementation

- Vassar's MATH 347 Bayesian Statistics, Fall 2017
- 16 Vassar students + 1 Swarthmore student + 1 Haverford student
- (2 mathematics courses being implemented in the same flavor in this project)

Goals for this talk

- Mechanics of the course
- Results of pre-course survey, preliminary evaluations
- Technical, administrative, and pedagogical issues, challenges, and solutions
- Next steps, discussion, and Q&A

Course Mechanics – course info

Class meetings

- MW 1:30-2:45pm @ Vassar
- Both synchronized (for 1 Haverford student) and unsynchronized accesses (for 1 Swarthmore student, and everyone else to re-watch); lectures posted on YouTube by 5pm
- One lecture delivered at Swarthmore in week 3

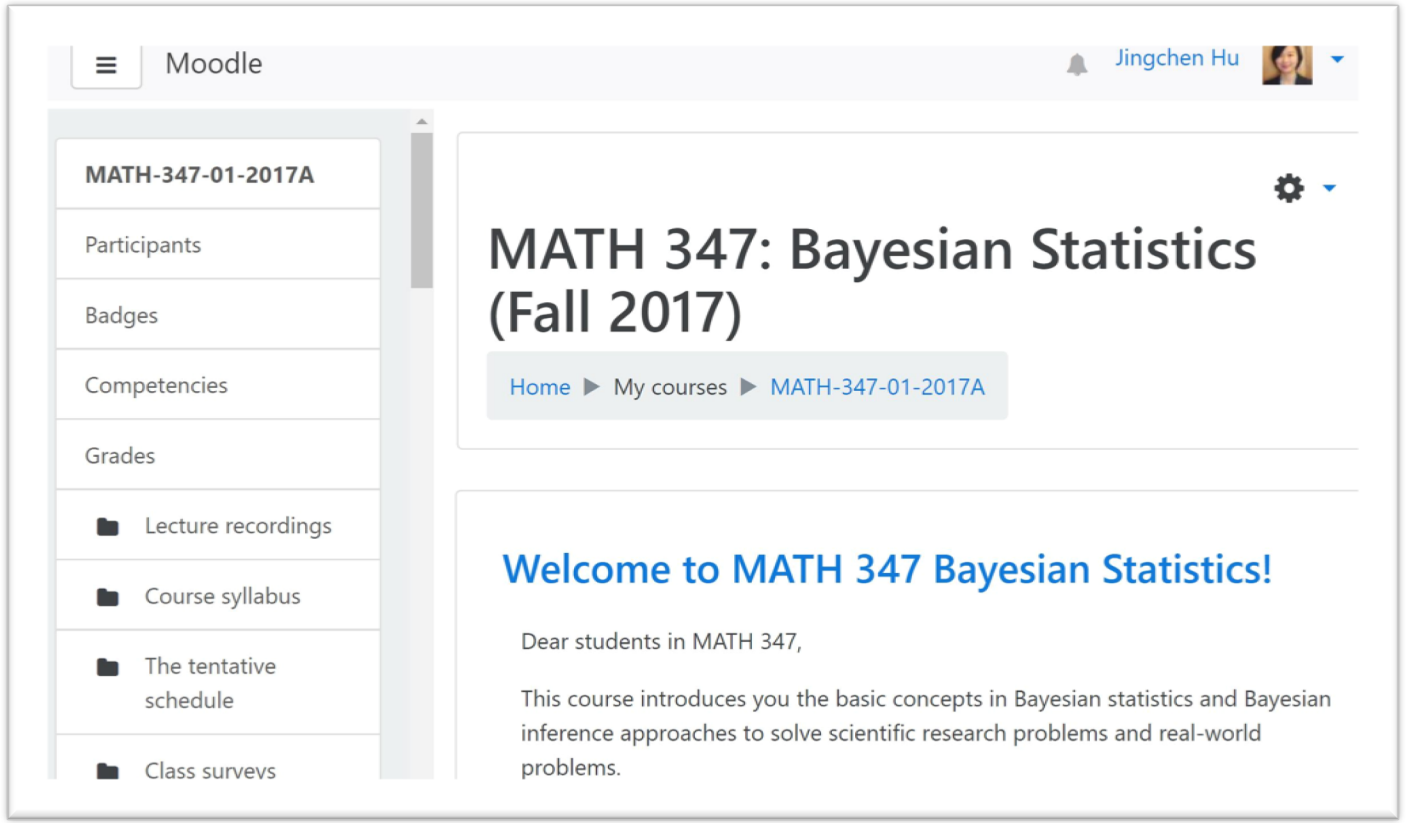
Office hours

- Regular office hours for local students (synchronized if requested)
- Designated online office hours for remote students, meet as a group
- TA's synchronized office hours

Course Mechanics – course info

Course material access

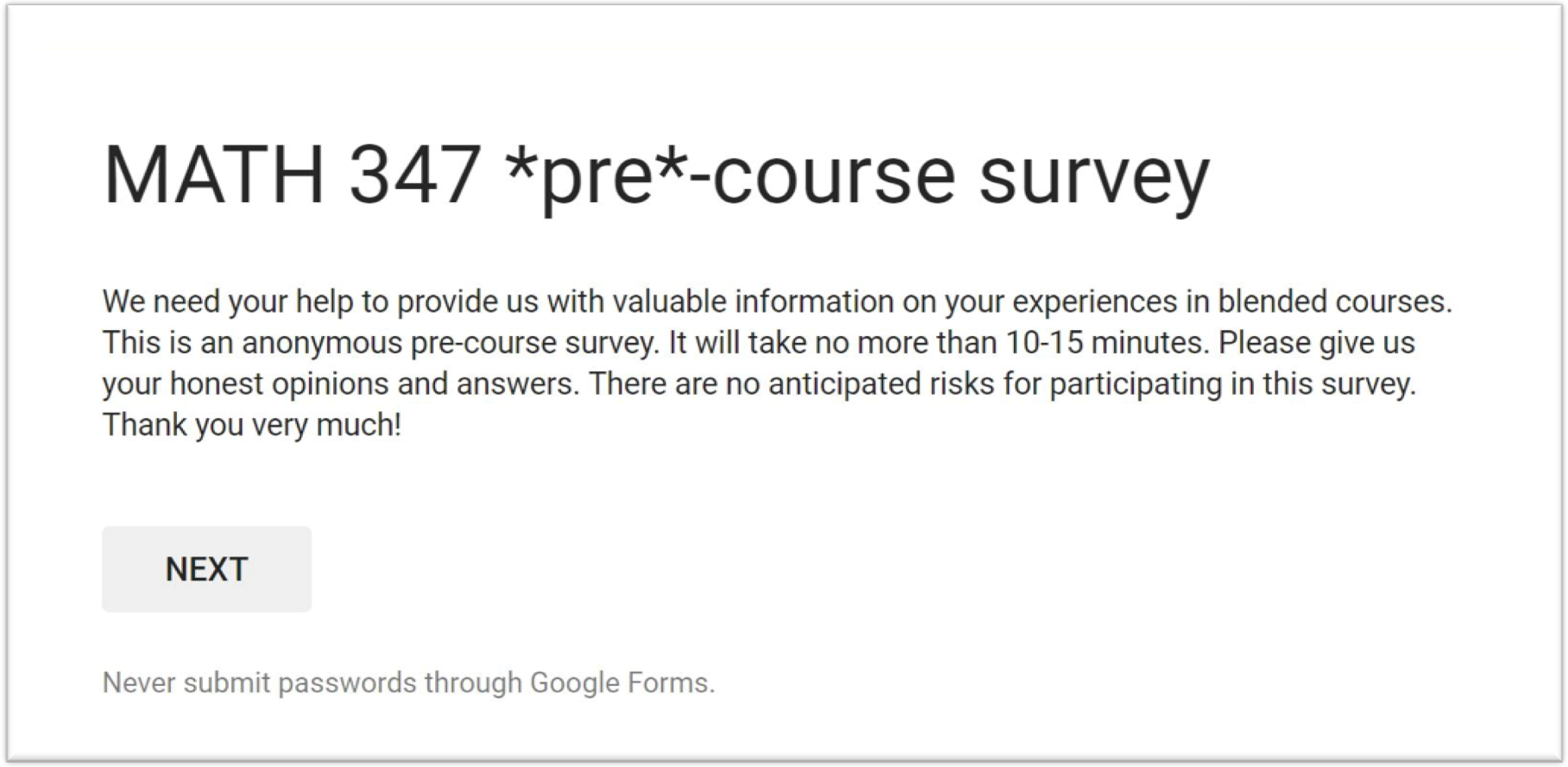
- Sponsored Moodle accounts for remote students



Course Mechanics – course info

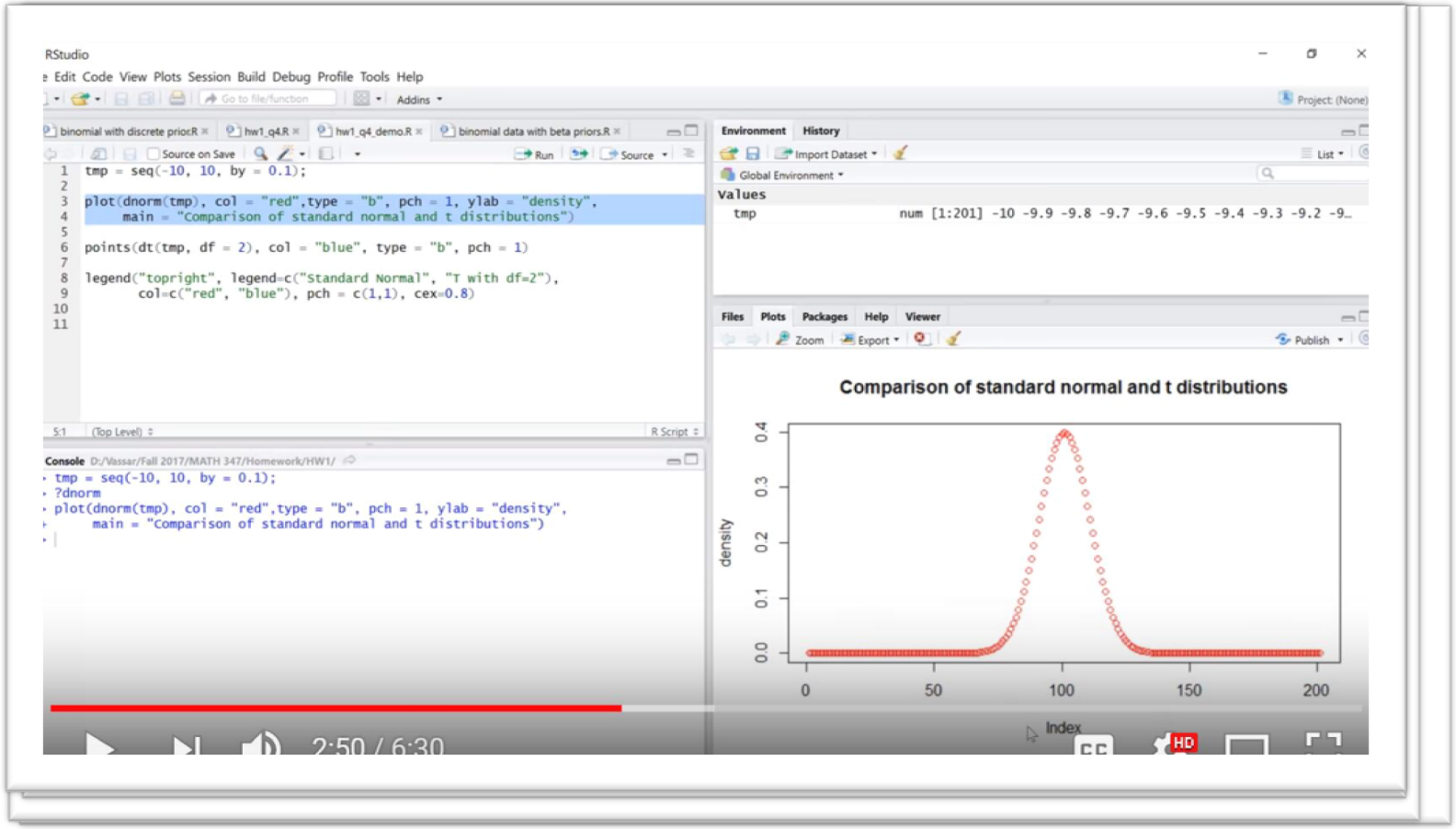
Course material access cont'd

- Extensive uses of Google Docs (sheets, and forms)



Course Mechanics – equipment

Software Zoom (slides, write on slides, write on white board, R, videos)



Course Mechanics – equipment

iPad Pro

- Take control, bring up slides from Dropbox and/or Google Drive

Apple pencil

- Write on slides and/or whiteboard on iPad

Laptop

- Take control for R demonstration

Bluetooth headset

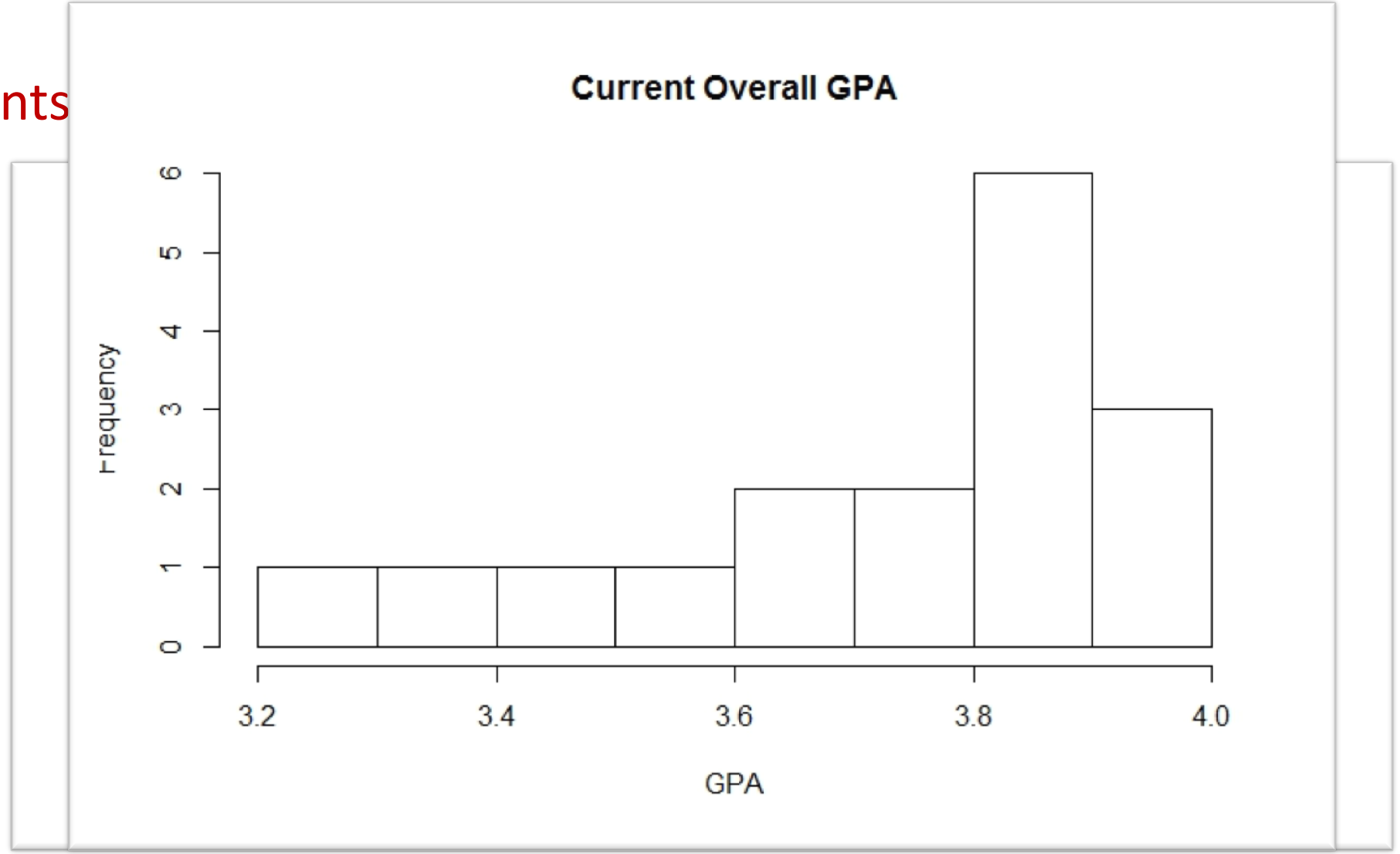
- Instructor can move around

Directional mic

- Record students' voice better

Pre-course survey results

Students



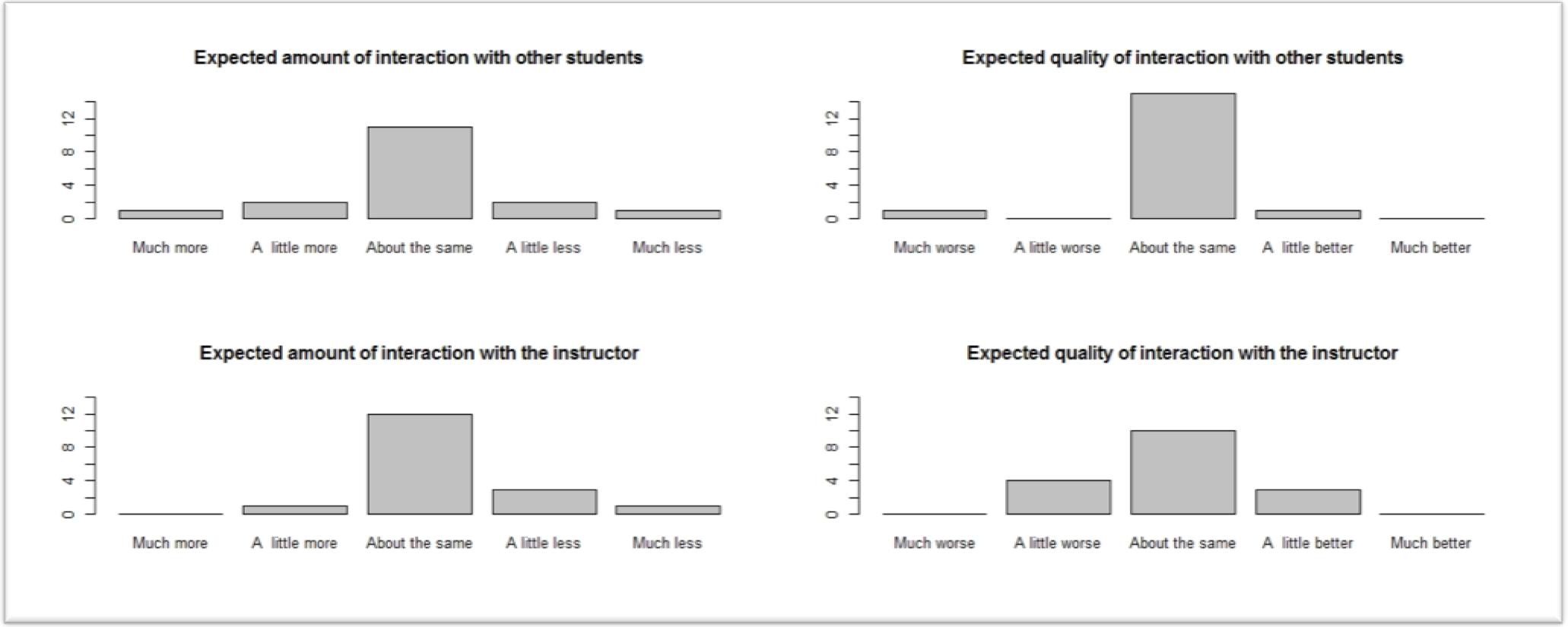
Pre-course survey results

Modality preference

other two categories with 0 counts: Extensive use of the Web, but still some face-to-face class time & Entirely online with no face-to-face time

Pre-course survey results

Students' expectation on amount and quality of interaction with other students and the instructor



Technical issues, challenges, and solutions

Microphone and audio setup

- Bluetooth headset for mic, classroom system for audio

iPad Pro controlling

- Switch between slides, PDF documents, white boards, R demonstrations
- Write on iPad with Apple pencil, functions of (multiple colors) pen, eraser, clear

Accessibility of Google Docs documents

- “Anyone with the link” vs “Vassar Google Education Accounts”

Lecture

- Engage remote students in real time lecture
  - Hard for them (actually just one) to talk to other students
- Don’t forget to click “Record lecture” at the beginning – learned my lesson

Administrative issues, challenges, and solutions

Sponsored accounts for Vassar Moodle

- Needed administrative approval

Course credits at remote schools

- Possible ways: independent study, part of senior thesis
- Each school operates differently; needs more general guidelines and procedures

Faculty liaisons at remote schools

- One per school: exam proctor, maybe more involvement
- Potential conflict in course offerings (e.g. Pomona's Advanced Real Analysis for Vassar students to sign up)

Administrative issues, challenges, and solutions

Institutional Review Board (IRB)

- Each school has different policies
- Needed extra energy to get this done

Local support for instructors

- Me: iPad Pro and other equipment from Vassar, designated grader for all students
- To scale up: course release or some other form of teaching credit

Pedagogical issues, challenges, and solutions

What to move online? In what form?

- Identify appropriate material to move online (video vs reading material?)
  - Review of pre-requisite material
  - Preview of upcoming material
  - Recap from lecture
  - Hint for homework problems
- Multimedia form (e.g. shorter videos) as a complement and/or alternative to the usual document form
  - Recommend to use multimedia form: any R demonstrations, step-by-step derivations

Pedagogical issues, challenges, and solutions

Online learning community

- Self introduction posts
  - Students' background (in statistics and in R programming), interests in project topics
- Actively utilize the forum function on Moodle to encourage all students to communicate to each other
  - Choose "forced subscription" – it's okay!
- Consciously create teams of local and remote students to work together
  - Recommend: data analysis examples from lecture and/or textbook, lab work
  - Generally difficult, especially when remote students cannot Zoom in real time

Pedagogical issues, challenges, and solutions

Other practices

- Moodle discussion boards on R questions and resources
- Moodle post on summary of students' interests
- 5-minute sharing at the beginning of each lecture

Plan to do

- A colleague from another department to make 15 minutes intro video before a topic
- Students to record a 2 minutes intro video about their individual/group class projects
- More group work outside of class – how?

Preliminary evaluations

- Students' performance assessment by mid semester

	n	HW mean	HW median	Midterm mean	Midterm median
Local students	16	74.7 (93.38%)	78 (97.5%)	40.72 (81.44%)	42.75 (85.5%)
Remote students	2	79.5 (99.37%)	79.5 (99.37%)	44 (88%)	44 (88%)

Preliminary evaluations

- Mid semester survey (7 responses so far)
  - Course pace is just about right (6)
  - Re-watch class videos: Never (4) + 1-2 times (3)
    - Usefulness of the recorded class videos? Break them down into shorter videos?
  - Amount and quality of interactions with other students and the instructor
    - Mostly around “About the same”
- End of semester survey

Next steps

LACOL

The Liberal Arts Consortium for Online Learning

Presentation at the EDUCAUSE Learning Initiative (ELI) Annual Meeting

- “Where's the remote? Upper level math/stats hybrid course sharing for the liberal arts”
- Joint presentation with a mathematics colleague from Williams College

Contribution to Math/Stats online teaching and learning

- Book chapters?
- Journal articles (e.g. The American Statistician, Journal of Statistics Education)?
- Magazine articles (e.g. Amstat News, Significance)?
- Guidelines?

Next steps

Steering committee (2 statisticians + 3 mathematicians, across 5 campuses)

- How to open up and structure a multi-campus dialogue between departments on opportunities for curricular exchange in the long term (should math and stats be two separate conversations?)
- How to engage with curriculum committees and registrars (when the time is right)
- Models to propose for the “faculty credit” issue (for lead teaching faculty and for liaisons)
- Models to propose for the “student credit” issue
- Models to propose for technology support

Discussion and Q & A

If you are…

- A faculty member, are you interested in teaching such a course? Why or why not?
- A student, are you interested in taking such a course? Why or why not?

What aspects of students' experience you would like to know?

What's your vision of a cross-campus collaboration?

- Advanced courses vs introductory and intermediate courses

How much to flip? How much to integrate?

How to enhance an online learning community?

Discussion and Q & A

Thank you!

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