Miscellaneous topics

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Sta 771S - Teaching Statistics

Teaching online

Fully online courses

Various audiences

- Small scale: university students
- Large scale: massive open online course (MOOC)

Synchronous vs. asynchronous

- Synchronous: students "meet" with you online
- Asynchronous: relies fully on previously recorded material
- Hybrid: a bit of both

Example: STA 104

Hybrid course for a small university audience

- Online version of STA 101, offered in the summer, for credit, for Duke students
- Virtual daily meetings on WebEx Training Center (recorded)
- 90 mins / day, 5 days / week, lecture + lab
- Breakout sessions for teamwork
- Assignments and forums (Piazza) on Sakai
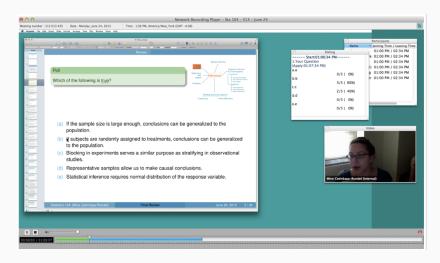- Materials posted on public course website

Recreating the classroom experience online

Recreating the clicker experience online

STA 104 – student feedback

- "I like the **convenience** of the online class but also the web chat structure makes it feel as if you are actually in a classroom. So it is the best of both worlds.
- "I really enjoy the **videos**! They are a very helpful learning tool. It is also nice to have them to go back to at any time to clear up a concept.
- "I like that the class is **discussion-based and interactive**. I enjoy working with my classmates on application exercises and we are able to explain concepts to each other in terms that we understand. I also like the various polls that we do during lectures because they **keep you engaged** and you can learn a lot from hearing other students explain the reasoning behind their answers.

STA 104 – reflection

Positive:

- Great experience
- Synchronous sessions worthwhile
- Assessment submission and grading on Sakai
- Teams on Sakai for application activity submission and reveal
- Performance assessments*

*Adopted in on-campus course

Questionable:

- Scalable
- Exams on Sakai
- One-on-one student support

Example: MOOC

- Data Analysis and Statistical Inference (DASI)
- Now redesigned as the Statistics with R Specialization on Coursera
  1. Introduction to Probability and Data
  2. Inferential Statistics
  3. Linear Regression and Modeling
  4. Bayesian Statistics
  5. Statistics Capstone Project

Preparing a MOOC

It takes a village!

- Course design
- Content and assessment generation
- Video production
- Backend support
- Student support – community TAs
- ...

MOOC: Assessments

- Formative
    - Suggested textbook exercises
    - In-video questions
- Summative
    - Data analysis labs (R/RStudio or DataCamp)
    - Unit quizzes (10-15 MC questions, 2 attempts)
    - Exams
    - Data analysis project (peer assessment)

MOOC: Why?

- Making educational resources widely and freely* available
- Good way to get your name out there
- Resources can be re-used on campus as part of a hybrid course

Teaching with online resources

Online resources

Hybrid courses using

- Videos – made by you vs. curated by you
- Online quizzes – immediate feedback
- Online discussion forums

Assessment

Levels of assessment

- Course level
- Program level

How to assess

- Set goals, e.g. at the end of this course/program students will be able to ...
    - Use Guidelines for Assessment and Instruction in Statistics Education (GAISE) as a starting point
- Collect data specifically addressing these goals, i.e. not just course grade information
- Use widely used assessment scales, e.g. CAOS - Comprehensive Assessment of Outcomes in a First Statistics course
- Do pre-post testing when possible
    - Make it a part of the course so it doesn't feel like additional work for students

Course evaluations

- Always do a mid-semester evaluation, and share summary of findings with students
  - Encourage them to be constructive and specific
  - Address concerns explicitly
  - See if anything can be changed about the course in a way that doesn't negatively impact your course plan but also satisfies the students
- Encourage students to provide feedback via the official course evaluation mechanism
  - Set aside class time
  - Send reminders
  - Encourage them to be constructive and specific
- Publicly available evaluations
  - Remind yourself that voluntary response bias exists
  - Do not say (or write in an email) anything that you don't want posted publicly
  - Grow a thick skin :)

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