Expectations! Aligning Students and Instructors in Blended Classroom Environments

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Classroom Styles & Innovations

- Traditional
  - Face-to-face contact
  - Assignments on paper or electronic (LMS)
- Semi-hybrid
  - Significant portion, but less than 75%, of course taught using LMS
- Hybrid
  - 75% or more of course is taught using LMS
- Online
  - No face-to-face
  - All instruction electronic (plus e-text or paper text)
  - Best-practice mandates video lectures

Lindenwood University: Styles

- Traditional
  - Most courses on campus
- Semi-hybrid
  - School of Accelerated Degree Programs
    - Most courses one four-hour face-to-face per week
  - School of Business and Entrepreneurship
    - Fall 2015, microeconomic principles: One 75-minute meeting per week
- Hybrid
  - School of Accelerated Degree Programs
    - Some courses meet only twice per semester
- Online
  - Large set of fully online courses

Lindenwood Semi-Hybrid

- School of Business and Entrepreneurship
  - Traditional: Tue & Thur on campus
  - Semi-hybrid: One day on campus, plus … ?
    - Videos
    - More homework
      - Electronic homework using publishers' LMS
      - Electronic traditional assignments (papers)
- School of Accelerated Degree Programs
  - Semi-hybrid: One night, 4 hours, a week on campus, plus … ?
    - Videos
    - More homework
      - Electronic homework using publishers' LMS
      - Electronic traditional assignments (papers)

Expectations: Mutually Consistent?

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- What do *instructors* expect to gain?
  - Reduced grading time, more time for lecture preparation, student contact
- What do *students* expect to gain?
  - Reduced study time, different learning styles, flexibility
- What do *publishers* expect to gain?
  - Increased revenue
  - Moving toward long-sought goal of killing used book market
- What do *administrators* expect to gain?
  - Reduce physical space demands & instructional costs
  - Increase enrollment
- All: Better student performance – Delivery vs. Teaching
- ***Are these compatible?***

Differences of Opinion!

- One author views electronic supplements as valuable for the educational process
  - Essential in online and semi-hybrid classes
  - Students can use questions as study guide
  - Especially valuable for students with weak foundations
- The other author sees less value…
  - Students behave as if e-homework is video game
    - Multiple attempts to insert correct answer
    - Hints and assistance leading to correct answer
  - Quiz and exam performance is poor
    - Weak performance when confronting student with same question
    - Weak learning of concepts and structure of material

Digital Learning Platforms

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<u>Publishers: Course/Textbook based</u>

- McGraw-Hill -- Connect
- Cengage -- Mindtap
- Pearson -- MyEconLab
- McMillan -- Lauchpad and Sapling

-> Advantage to Instructor: Pre-loaded with assignments

Digital Learning Platforms

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Not for Profit, Topic Based

- Marginal Revolution University
- Kahn Academy

Agnostic

- Soft Chalk

Non-proprietary open source alternative

- TC Exam
- None

Where Is the Evidence Re Learning Effectiveness?

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- Case Studies
- What literature can we find?

McGraw-Hill Education *Connect*: *Effectiveness Study 2013*

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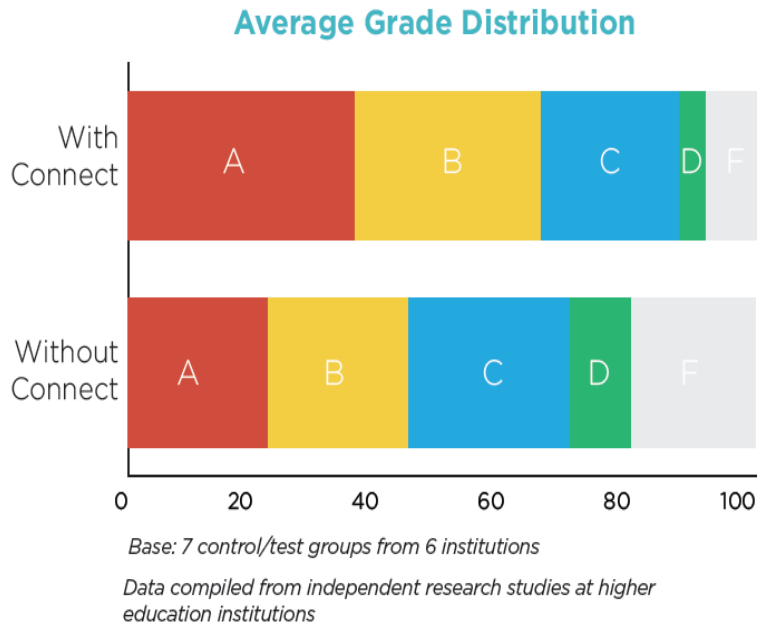
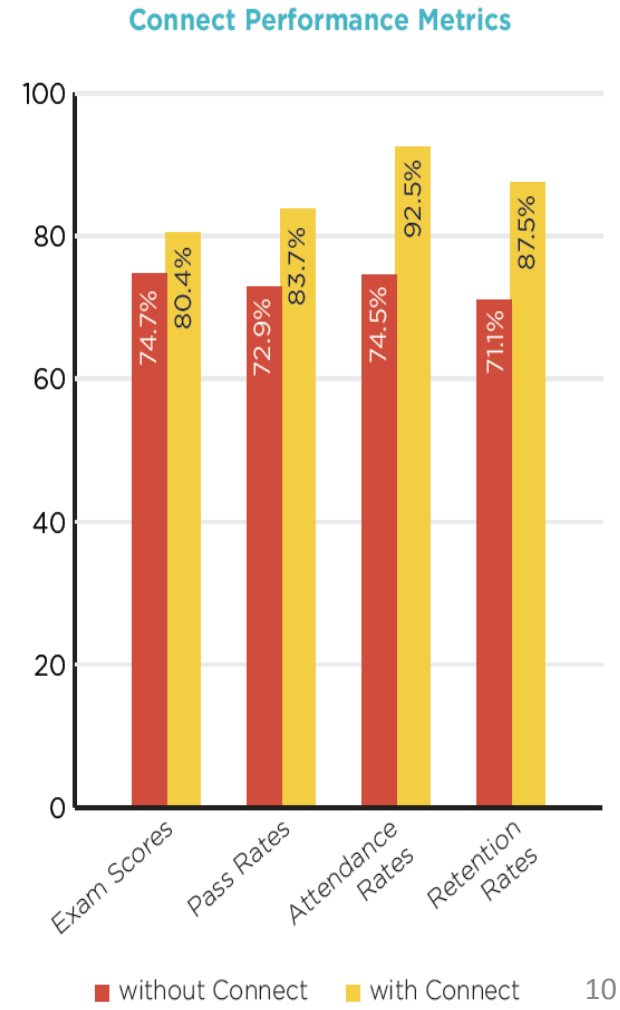
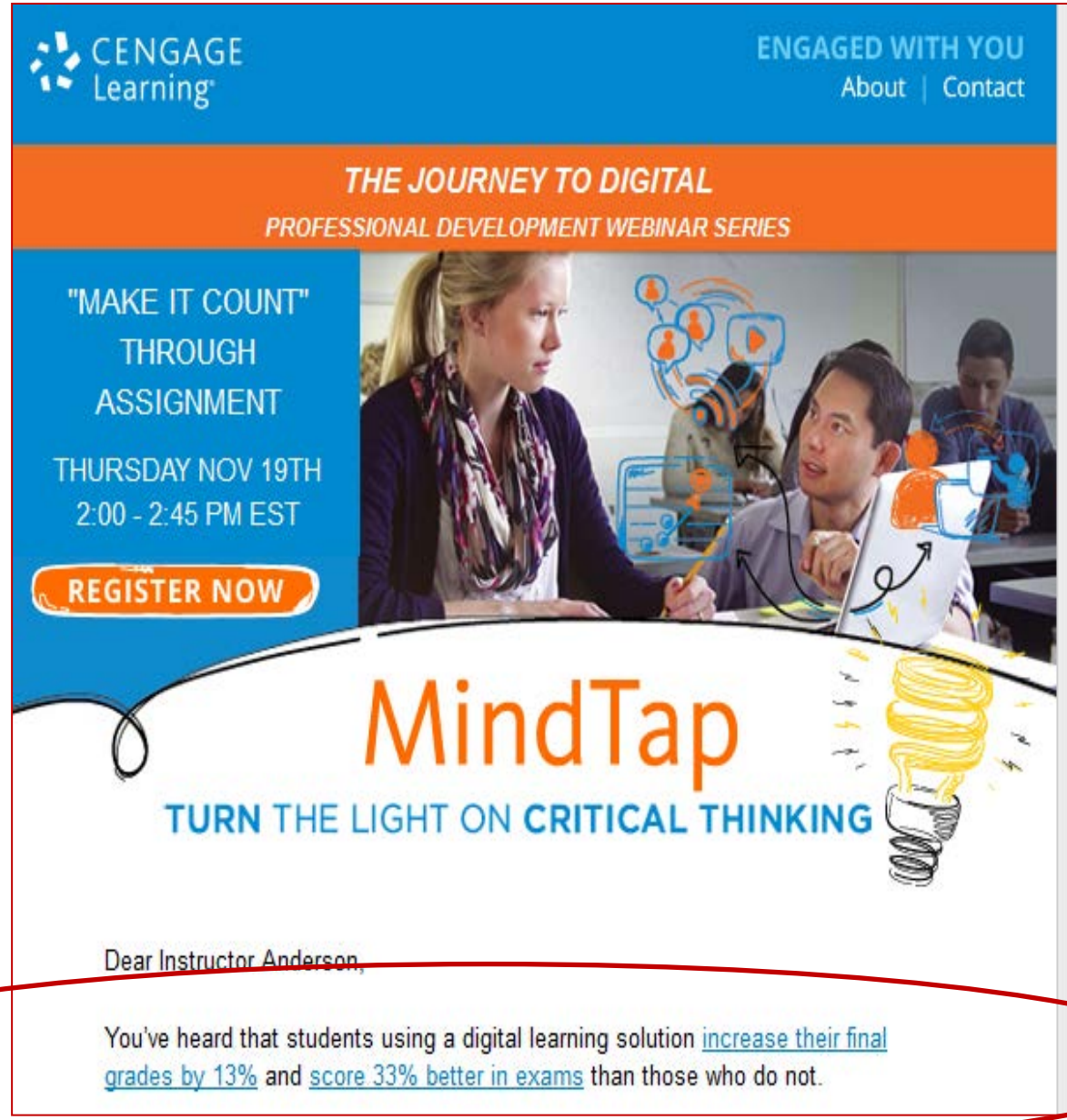
- Data [informal] from 34 case studies
- No control groups, no blind studies

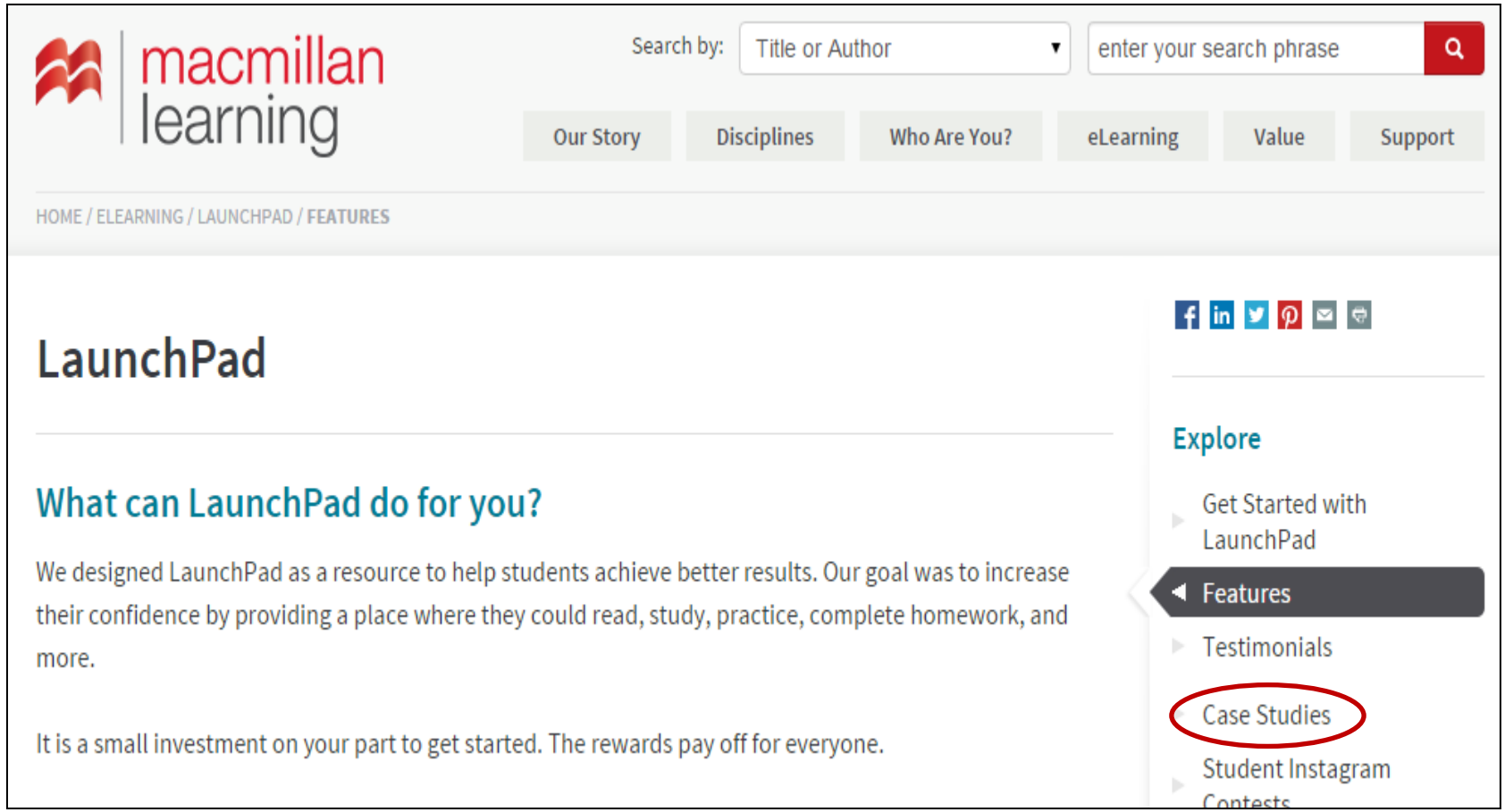




Cengage *MindTap*

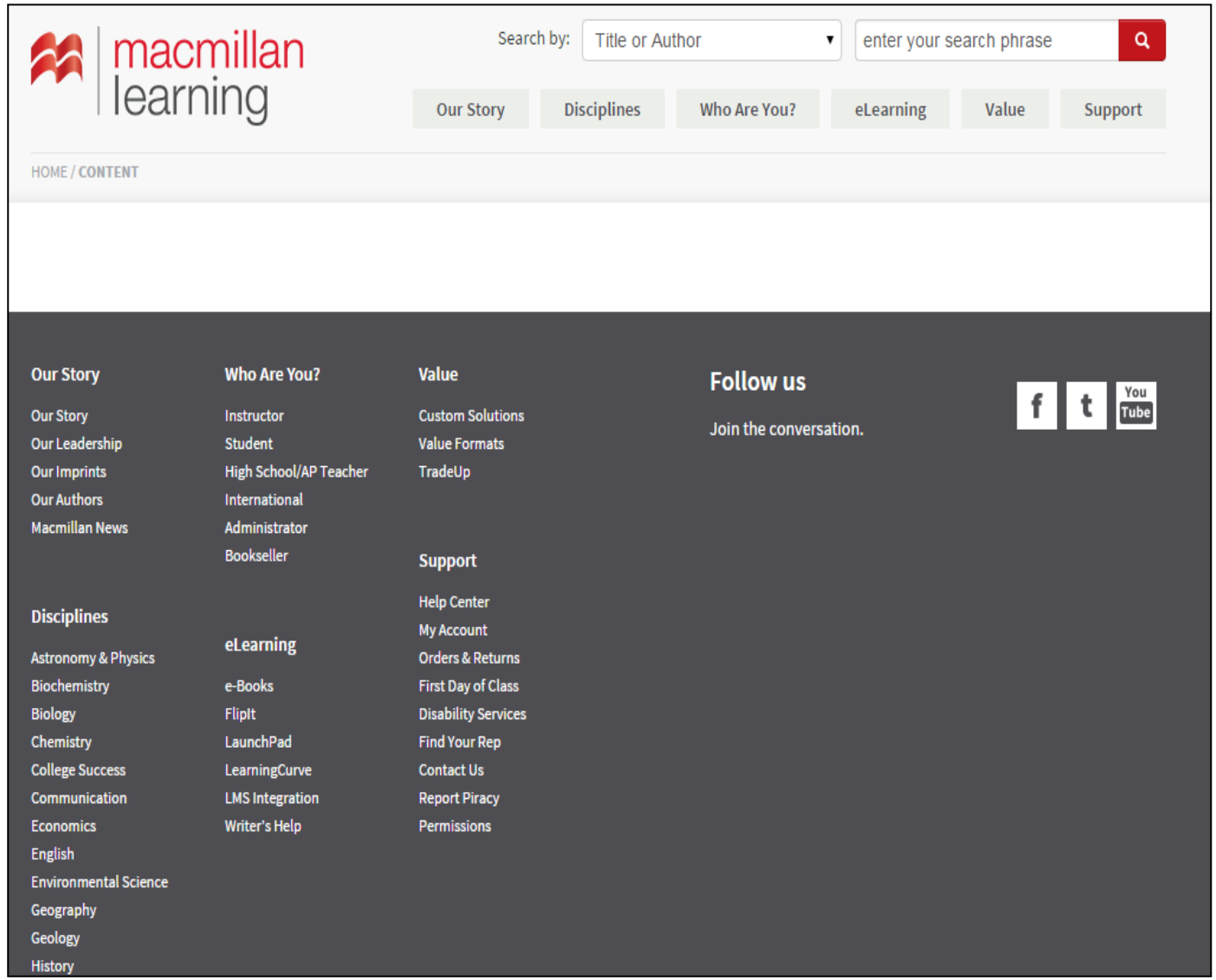


Macmillan Launchpad



Case Studies?...

none



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Pearson MyEconLab

A clear reminder that correlation is not causation… *post hoc ergo propter hoc*

Source: *REVEL Implementation Strategies for High Impact, Efficacy Report.* Pearson. 2015

Research Standards

Pearson adheres to the Software & Information Industry Association (SIIA) guidelines for evaluating educational technology products. The key guidelines are:

- Ask the right question.
- Support the implementation of the product or service.
- Plan a study of sufficient size and duration to demonstrate an effect.
- Plan for plausible causal claims.
- Avoid (the appearance of) conflicts of interest.
- Provide a comprehensive and detailed research report.
- Make the research findings widely available.
- Accurately translate research for customers.

Correlational studies are not meant to imply causality. Rather, they demonstrate interesting associations that may be used for further theory building or theory testing in future experimental studies.

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Pearson, MyEconLab case study

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MyEconLab	
School Name	Rock Valley College, Rockford, IL
Course Name	Principles of Economics: Microeconomics, Principles of Economics: Macroeconomics
Course Format	Flipped, lecture, online

Key Results Data show that students who earned higher MyEconLab scores also earned higher average exam grades. Data also indicate that students who completed all the MyEconLab homework assignments acheived higher average quiz, exam, and final course grades than students who skipped at least one MyEconLab homework assignment.

Pearson, MyEconLab case study

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Challenges and Goals

In summer 2013, [redacted] was teaching an online version of his Microeconomics course and had little time to work on creating online quizzes and tests. Since commercial digital programs were available, he decided that trying to recreate the time-consuming work around summative assessments that had already been produced and designed was an inefficient use of his time. MyEconLab had the necessary quizzes and exams for an online course, and the inclusion of homework creation and student help aids facilitated its incorporation into his face-to-face classes, as well.

What Can Be Learned?

Conditional on holding constant course structure and student characteristics…

Case 1:

… does attendance affect student performance?

-> traditional answer: students who attend class obtain better grades

Case 2:

… does face-to-face class time affect student performance?

- Have digital systems made face-to-face time unimportant/irrelevant for student learning?

Scientific Studies

- Joyce, Crockett, Jaeger, Altindag, O'Connell. "Does Classroom Time Matter?" *Economics of Education Review*. 2015a.
- Joyce, Crockett, Jaeger, Altindag, O'Connell, and Remler. "Do Students Know Best? Choice, Classroom Time, and Academic Performance." NBER Working Paper 21656. October 2015b.
  - Only "scientific" studies that we are aware of
  - Doubly randomized preference trial (DRPT)
  - Compare performance of students in
    - i) traditional twice-a-week lecture format
    - ii) hybrid once-a-week plus e-learning materials

E.g., Romer (1993) on attendance

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- Motivation: David Romer's 1993 article: "Do students go to class? Should they? "*Journal of Economic Perspectives.*
  - Students with regular attendance earned one full letter grade higher than students with sporadic attendance.
  - Regression estimates between performance and attendance, for students who did all problem sets, and controlling for previous GPA.
  - Econometric difficulty in that attendance is a *choice* by the student, not exogenous
  - *Very* small dataset: Collected attendance in six meetings of a large intermediate macroeconomics course
  - Romer notes that he obtains the same qualitative results as previous anecdotal studies, but his is the first quantitative study.
  - For later studies, see citations in Joyce et al (2015)

Joyce et al (2015b)

- “Estimating how academic performance is affected by a student’s choice of the location [and style] of learning (e.g., online, in the classroom, or a mixture of the two) entails overcoming the same sources of bias facing past researchers in their pursuit of casual estimates of attendance.”

- Why not overcome selection bias via randomization?

Joyce et al (2015b)

- Why not overcome selection bias via randomization?
  - E.g., Assign students to online, hybrid, or traditional lecture
  - But *choice* reappears:
    - Students might refuse to be randomly assigned
    - Students might dislike assignment
    - Students' motivation and attachment might be reduced by "forced" randomization

  => few schools are likely to allow such a randomization experiment
  - How to pursue randomization?

Joyce et al (2015b)

- “Doubly randomized preference trial” (DRPT)
- First, via random selection, place students into either an “experimental” or “choice” setting
  - Those in the experimental setting are randomly sorted between “treatments”
  - Those in the choice setting select between treatments
  - Allows estimation of selection bias that results when subjects choose their own treatment
  - Allows estimation of how choice of treatment alters the effect of the treatment

Joyce et al (2015b)

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Experiment:

- Principles of Microeconomics
- Two formats: “traditional” two lecture per week, or “hybrid” one lecture per week
- Fall term 2013
  - Randomized 725 students between the two formats
- Fall term 2014
  - Allowed students to choose format
- Both formats used same e-learning resources

Joyce et al (2015b)

- Experimental Shortcomings:

  => No explicit randomization of experimental vs. choice arms

  => The experiment tests directly value of face-to-face class time

  => The experiment only indirectly tests the value of e-learning systems as a substitute for face-to-face class time

Joyce et al (2015b)

Outcome:

- Class time improved student performance – but the effect is small
- Effect is smaller than in all previous studies

- In the “choice” portion, class time improved performance less than in the randomized portion
  => Students self-selected into their better format

Conclusions: Further Research

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There is little *scientific* evidence regarding the efficacy of e-learning schemes in promoting better learning.

- A great deal of marketing literature and case studies.
- E-learning schemes often are introduced when a course is “re-engineered.” Is it the e-learning scheme or the re-engineering?
- How do we separate the “testing effect” and “placebo effect” from genuine educational improvement? (e.g., points for attendance)

Conclusions: Further Research

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- As more “adjunct” faculty replace full-time faculty, are e-learning schemes being used as “quality control”?
- E-Learning schemes will continue to grow with hybrid and online classes, making scientific studies of high value
- Reduce the unit cost of higher education
- Increase labor productivity in higher education