



# Online Learning: Academic and Labor Market Outcomes

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# Overview

- A second look at research in 4-year colleges
- Emergent research in 2-year colleges
- Potential solutions: moving forward

# Research in Four-Year Colleges

- **Department of Education meta-analysis (2010)**
  - Only 7 rigorous studies of fully-online semester-length college courses
  - On average no difference
  - Elite settings; small, selected courses
  - Withdrawal rates not discussed

# Research in Four-Year Colleges

- **Department of Education meta-analysis (2010)**
- **Quasi-experimental work (economics)**
  - Students performed worse online
  - Gaps larger for men, financial aid recipients, those “not good at math”

# Research in Four-Year Universities

- **Department of Education meta-analysis (2010)**
- **Quasi-experimental work (economics)**
- **Figlio et al. (2013, *J Labor Econ*)**
  - Live-lecture performed modestly better
  - Largest gaps for Hispanics, males, students w/ lower prior GPA

# Community College Research

- **Two-year colleges**
  - Both career paths & university transfer paths
  - 8 million students (45% undergrads)
  - High proportions low-income / first-generation
- **Our studies**
  - Entire CC system in VA & WA – Jaggars & Xu
  - 3rd anonymous CC system & several CCs in 4th state – CAPSEE: Streich
  - Every online & f2f course taken

# Fully-Online Students

- Most “online” CC students mix online & f2f (VA & WA)
  - Nearly half take at least 1 online course
  - Very few take all courses online
- Students in online courses positively selected (all 4 states)
  - More likely older, have dependents, employed full-time
  - More likely female, White, higher-income, academically prepared at entry, English-fluent
- Students select easier subjects to take online (qual in VA; quant in Streich’s 2 anon states)

# Online Course Outcomes, VA & WA CCs

Virginia	% Persisting	If persist, % C+
Intro English courses	- 11	- 7
Intro Math courses	- 15	- 10

➤ Multilevel PSM results, all coefficients significant  $p < 0.01$ , Xu & Jaggars (2011), *EEPA*

Washington	% Persisting	Grade (0-4)
Transfer-path students, all online & f2f courses	- 6	-0.32

➤ IV results based on distance, all coefficients significant  $p < 0.01$ , Xu & Jaggars (2013), *EER*

# Online Course Outcomes, Streich

All online & f2f courses	% Persisting	If persist, % D+
All CCs, anon. 3 <sup>rd</sup> state	- 6	- 8
4 CCs in 4 <sup>th</sup> state	- 5	- 6

- Student\*term fixed-effects model, all coefficients significant  $p < 0.01$ , Streich (2014), U Mich diss.

# Heterogeneity (WA, 3rd & 4th state)

- Decrement in performance (online vs. f2f) stronger for:
  - Males
  - Younger students
  - Academically-underprepared or lower-GPA students
  - Black students (WA)

WA, all online/f2f courses	% Persisting	If persist, grade (0-4)
White	- 3	- 0.14
Black	- 5	- 0.23
Hispanic	- 4	- 0.14

➤ Fixed-effects results, all coefficients significant  $p < 0.01$ , Xu & Jaggars (2014), *JHE*

# Employment & Wages

- Level & growth of student wages depressed while enrolled (e.g., Jaggars & Xu, 2014)
- Students already more attached to labor market = more likely to choose online courses
  - Higher pre-college wages
  - Stronger pre-college growth in wages (Streich, 3rd state)
- Streich analysis (3rd state):
  - Focuses on CC students 20+ years old
  - Individual fixed-effects model controls for pre-college wage level but not necessarily growth trend
  - Students attended college but didn't necessarily graduate

# Streich (3rd state) Findings

- Earnings depressed by \$350 for each credit currently attempted, but only by \$79 if that credit is online
- Online credits may have substantial positive “work experience” implications, somewhat offset by mild negative “human capital” effects
- In long-term, taking any number of online credits has positive labor market implications, but additional online credits have no additional benefit – somewhat puzzling.
- Long-term “any online credits” estimate much stronger for students aged 30+ vs. 20-29
  - 6 years after enrollment: \$1518 vs. \$804

# Implications

- **Online coursework**
  - Seems to benefit older, working, motivated adults
  - May be problematic for younger, less-motivated, or less-prepared students
- **Improving online learning** (e.g., Jaggars & Xu, 2013, CCRC WP; Jaggars, 2014, *AJDE*)
  - Not all students have had opportunity to develop self-directed learning skills
  - If expect students to successfully learn online, must help cultivate these skills
  - Students believe teacher presence, guidance, encouragement are key

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