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

<table>
<thead>
<tr>
<th>Virginia</th>
<th>% Persisting</th>
<th>If persist, % C+</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intro English courses</td>
<td>- 11</td>
<td>- 7</td>
</tr>
<tr>
<td>Intro Math courses</td>
<td>- 15</td>
<td>- 10</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Washington</th>
<th>% Persisting</th>
<th>Grade (0-4)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Transfer-path students, all online &amp; f2f courses</td>
<td>- 6</td>
<td>-0.32</td>
</tr>
</tbody>
</table>

- IV results based on distance, all coefficients significant $p < 0.01$, Xu & Jaggars (2013), *EER*
## Online Course Outcomes, Streich

<table>
<thead>
<tr>
<th>All online &amp; f2f courses</th>
<th>% Persisting</th>
<th>If persist, % D+</th>
</tr>
</thead>
<tbody>
<tr>
<td>All CCs, anon. 3rd state</td>
<td>- 6</td>
<td>- 8</td>
</tr>
<tr>
<td>4 CCs in 4th state</td>
<td>- 5</td>
<td>- 6</td>
</tr>
</tbody>
</table>

- 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)

<table>
<thead>
<tr>
<th>WA, all online/f2f courses</th>
<th>% Persisting</th>
<th>If persist, grade (0-4)</th>
</tr>
</thead>
<tbody>
<tr>
<td>White</td>
<td>- 3</td>
<td>- 0.14</td>
</tr>
<tr>
<td>Black</td>
<td>- 5</td>
<td>- 0.23</td>
</tr>
<tr>
<td>Hispanic</td>
<td>- 4</td>
<td>- 0.14</td>
</tr>
</tbody>
</table>

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