Noncredit Vocational Education in Community College:
Students, Enrollment Patterns, and Academic Outcomes

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Vocational education: Why do we care?

• Rapid growth:
  – The increase of course enrollment is more rapid for noncredit courses than credit-bearing courses
  – Most such growth has been associated with vocational and workforce training.

• Great demand:
  – Rapid increase in “middle-skill” jobs
  – Strong calls for more skilled workforce
Vocational education: What do we know?

• Limited information:
  – Noncredit courses are not included in most state and national postsecondary datasets

• Previous literature:
  – Method: mostly anecdotal
  – General findings:
    • Two-year institutions viewed noncredit course activity as an important mission.
    • Compared with for-credit students, students enrolled in noncredit vocational courses tend to be older learners, who hope to obtain skills for career progression.
    • Noncredit courses are more likely to be offered in areas that are closely tied to an occupation.
    • Researchers note the potential of noncredit education to serve as a bridge to enrollment in for-credit education.
Research questions

• What are the characteristics of degree-seeking noncredit vocational students in community colleges and how do these students differ from degree-seeking students enrolled in credit-bearing programs?

• To what extent do degree-seeking noncredit vocational students bridge to credit-bearing programs?

• What student-level and institution-level characteristics predict successful bridge to credit-bearing programs?

• What are the degree attainment outcomes for degree-seeking noncredit vocational students?
Data description

- Data from 9 community colleges in 1 state: student profile, transcript, and outcome

- 60,846 students who first enrolled in 2007 academic year.
  - Track students progress and outcomes from 2007-08 AY to 2012-13 AY (6 years).

- 294,124 courses, including both credit and noncredit courses
Sample restriction

• Sample restriction in two ways:
  – Drop students who had only taken ESL, ABE, GED courses in the six years of tracking period (24 % of the original sample)
  – Restrict our sample to students who had showed an intention to get any types of degree or certificate for enrollment during the first term

• Analytic Sample: 19,600 students
Key definitions

• Noncredit student:
  – Students who exclusively took noncredit vocational courses in their first term of enrollment
  – 14% in the analytic sample

• Bridging:
  – Noncredit students who took more for-credit courses than noncredit vocational courses by the end of six year of tracking period.
  – 17% of noncredit students
# Noncredit students: Who are they?

<table>
<thead>
<tr>
<th></th>
<th>Noncredit students</th>
<th>Credit students</th>
<th>Diff (noncredit - credit)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Age</strong></td>
<td>35.66 [11.74]</td>
<td>22.36 [9.25]</td>
<td>13.31*** [0.20]</td>
</tr>
<tr>
<td><strong>Earned high school diploma</strong></td>
<td>0.82 [0.38]</td>
<td>0.91 [0.28]</td>
<td>-0.09*** [0.01]</td>
</tr>
<tr>
<td><strong>Received Pell grant</strong></td>
<td>0.00 [0.00]</td>
<td>0.14 [0.35]</td>
<td>-0.14*** [0.01]</td>
</tr>
<tr>
<td><strong>Full time enrolled in first term</strong></td>
<td>&lt;0.01 [0.07]</td>
<td>0.36 [0.48]</td>
<td>-0.36*** [0.01]</td>
</tr>
<tr>
<td><strong>N</strong></td>
<td>2,663</td>
<td>16,937</td>
<td></td>
</tr>
</tbody>
</table>

- In general, noncredit students looked less like traditional college students.
- They were older, less academically prepared, and came from less advantage social-economic background.
Noncredit students: Enrollment pattern

• More than half of noncredit students only enrolled in the community college for 1 term and never came back

• Compared with noncredit students, credit students are more likely to
  – enrolled for consecutive terms
  – enrolled in a longer period of time

• Many of noncredit students who later enrolled in credit-bearing courses dropped out of college right after one or two semesters of enrollment
Which variables predict **bridging**?

- Multilevel model:
  - Level 1: Logit \( (Y_{ik}) = \beta_{0k} + \beta_{1k}X_{ik} + \varepsilon_{ik} \)
  - Level 2: \( \beta_{0k} = \beta_{0k} + \beta_{1k} \alpha_k + r_{0k} \)
  - \( \beta_{1k} = \beta_{1k} \)

- Significant predictors include:
  - Institutional level:
    - percentage of students aged 18 – 24 (+); percentage of students receiving federal aid (-)
    - tuitions and fees (-)
    - locate in big city (+)
    - distribution of institutional expenses: institutional support (+), academic support (-)
  - Student level:
    - Female (+)
    - Age (-)
    - Enrollment intensity (+)
Academic outcomes

- Fixed effect model: \( \Pr (Y_{ij}) = \beta_0 + \beta_1 X_{ij} + \beta_2 Z_j + \beta_3 \text{Vocational}_{ij} + \epsilon_{ij} \)
  - \( Y_{ij} \): = 1 if earned a certificate or degree, transfer to a four-year college within six years
  - \( X_{ij} \): student characteristics; \( Z_j \): college indicator
  - Variable of interest: \( \beta_3 \)

- Compared to students similar in observable baseline characteristics but started in credit programs, the average probability of getting any types of educational award within six years is 12 percentage points lower among noncredit students than credit students
Future steps

• Improve academic outcome model:
  – Apply PSM model to compare 6-year academic outcome between vocational students and non-vocational students with observable characteristics more alike.

• Explore the fields of study among students who started their college career in noncredit vocational programs and the extent to which the bridging rate varies by field of study
For more information

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<table>
<thead>
<tr>
<th></th>
<th>Vocational Student</th>
<th>Non-vocational Students</th>
<th>Difference</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>-0.08***</td>
</tr>
<tr>
<td>Female</td>
<td>0.45 [0.50]</td>
<td>0.53 [0.50]</td>
<td></td>
</tr>
<tr>
<td>Race</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>White</td>
<td>0.58 [0.49]</td>
<td>0.65 [0.48]</td>
<td>-0.07***</td>
</tr>
<tr>
<td>Black</td>
<td>0.27 [0.45]</td>
<td>0.22 [0.41]</td>
<td>0.06***</td>
</tr>
<tr>
<td>Hispanic</td>
<td>0.05 [0.22]</td>
<td>0.04 [0.19]</td>
<td>0.01***</td>
</tr>
<tr>
<td>Asian</td>
<td>0.02 [0.13]</td>
<td>0.02 [0.14]</td>
<td>&lt;0.01</td>
</tr>
<tr>
<td>SES</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Median household income</td>
<td>54014.54 [24759.44]</td>
<td>56623.32 [24491.78]</td>
<td>-2608.78***</td>
</tr>
<tr>
<td>Poverty rate</td>
<td>0.11 [0.12]</td>
<td>0.09 [0.11]</td>
<td>0.02***</td>
</tr>
<tr>
<td>Non English speaking population</td>
<td>0.13 [0.11]</td>
<td>0.11 [0.09]</td>
<td>0.02***</td>
</tr>
<tr>
<td>Bachelor's degree recipient percentage</td>
<td>0.30 [0.20]</td>
<td>0.33 [0.19]</td>
<td>-0.02***</td>
</tr>
<tr>
<td>Percentage who work in professional occupation</td>
<td>0.35 [0.16]</td>
<td>0.37 [0.15]</td>
<td>-0.02***</td>
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</tr>
<tr>
<td>Earned GED</td>
<td>0.07 [0.25]</td>
<td>0.03 [0.19]</td>
<td>0.03***</td>
</tr>
<tr>
<td>Dual enrolled in high school</td>
<td>&lt;0.01 [0.04]</td>
<td>0.07 [0.26]</td>
<td>-0.07***</td>
</tr>
<tr>
<td>In state students</td>
<td>0.68 [0.47]</td>
<td>0.66 [0.47]</td>
<td>0.02***</td>
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<tr>
<td>Successfully bridged</td>
<td>0.17 [0.38]</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sample size</td>
<td>2,663</td>
<td>16,937</td>
<td></td>
</tr>
</tbody>
</table>
Vocational course: *Course completion*

<table>
<thead>
<tr>
<th></th>
<th>Full Sample</th>
<th>Vocational courses</th>
<th>Other course</th>
<th>Diff (vocational – nonvocational)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Completion</td>
<td>0.718 (0.450)</td>
<td>0.752 (0.431)</td>
<td>0.708 (0.454)</td>
<td>0.044***</td>
</tr>
<tr>
<td>Observation</td>
<td>294,124</td>
<td>66,007</td>
<td>228,117</td>
<td></td>
</tr>
</tbody>
</table>

- After control for student characteristics, course characteristics and institution characteristics, vocational courses are 8 percentage points more likely to be completed:

\[
Pr (Y_{ij}) = \beta_0 + \beta_1 X_{ij} + \text{vocational}_{ij} + \epsilon_{ij}
\]