Community College Transfer Students’ Persistence at University

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• Community college students constitute 45% of all undergraduate students
• 81% of entering CC students report intending to earn a bachelor's degree
About UMUC

• Online, open-admissions university
• Over 83,000 students enrolled online
• Primary transfer destination for students from local community colleges
• Each semester UMUC enrolls:
  • 500 new, full-time community college students
  • Over 2,500 new, part-time community college students
Community College Partners

- Montgomery College
  - Diverse population of over 60,000 students a year from 75 different countries
  - Offers more than 600 courses in over 40 areas of study, across three areas

- Prince George’s Communication College
  - Diverse population of over 40,000 students from 103 countries
  - Offers more than 200 academic, workforce development, and continuing education programs
Purpose of Present Study

- Predicting community college transfer student persistence at four-year, online university
- **Persistence**: continued enrollment and progress toward meeting academic goals
Students’ Academic Pathways

• Developed Memorandum of Understandings (MOU) to create data sharing partnerships

• Kresge grant enabled data sharing partnership between community colleges and UMUC to understand students’ academic backgrounds
Focus of research has been on student performance.

Theoretical models of student attrition (Bean & Metzner, 1985; Tinto, 1975)
- Focused on traditional students
- Emphasize institutional fit to physical institution
Factors in Persistence

External Factors:
- Demographics
- Academic Skills

Academic Integration

Institutional Commitment

Social Integration

GPA

Intent to Persist

Goal Commitment

University of Maryland University College
Present Study

Demographic Factors

Community College Course Taking Backgrounds

UMUC First Semester Factors

Re-Enrollment

Retention

Graduation
Defining Outcomes of Interest

- **Re-enrollment:** enrollment in the immediate next semester after the first semester of transfer
- **Retention:** Re-enrollment within a 12-month window, following first semester of transfer
- **Graduation:** Earning a first-bachelors degree with an 8-year period, following first semester of transfer
Student Population

Re-enrollment and Retention

- 8058 community college transfer students from MC and PGCC enrolled in their first semester at UMUC, Spring 2005 – Spring 2011

Eight-Year Graduation

- 2040 community college transfer students from MC and PGCC, enrolled in their first semester at UMUC, Spring 2005 – Spring 2006
### Defining Student Success

- **Successful First Term GPA**
- **Re-enrollment and Retention**

<table>
<thead>
<tr>
<th>UMUC First Term GPA</th>
<th>Mean GPA = 2.53</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>76% GPA ≥2.0</td>
</tr>
</tbody>
</table>

| Re-Enrollment       | 66%            |

| Retention           | 78%            |

| Eight-Year Graduation | 49%            |
Predicting Re-Enrollment
Re-Enrollment

- Female***
- Minority Status*
- Married*
- Repeated a Course**
- Enrolled in a Dev Course***
- Exempt from Dev Math**
- Community College GPA**
- First Term GPA at UMUC***
- First Term Credits Earned at UMUC***
- Cum Credits Transferred to UMUC***
Predicting Retention
Predicting Graduation
# UMUC Success Calculator

## Student Information

<table>
<thead>
<tr>
<th>Field</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td>Male</td>
</tr>
<tr>
<td>Age At Transfer</td>
<td>25</td>
</tr>
<tr>
<td>Race/Ethnicity</td>
<td>Asian</td>
</tr>
<tr>
<td>PELL Grant Recipient</td>
<td>No</td>
</tr>
</tbody>
</table>

## Predicting Graduation

<table>
<thead>
<tr>
<th>Field</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Math at CC</td>
<td>No</td>
</tr>
<tr>
<td>Percentage of Courses Withdrawn From</td>
<td>20%</td>
</tr>
<tr>
<td>Received an Associated Degree</td>
<td>Yes</td>
</tr>
<tr>
<td>CC Cum GPA</td>
<td>3.56</td>
</tr>
<tr>
<td>CC Cum Credits Earned</td>
<td>60</td>
</tr>
<tr>
<td>First Term GPA at UMUC</td>
<td>3.5</td>
</tr>
<tr>
<td>UMUC First Term Credits Earned</td>
<td>12</td>
</tr>
</tbody>
</table>

**Probability of Graduating in Eight-Year Period**: 77%
# Model Summary

<table>
<thead>
<tr>
<th>Predictive Model</th>
<th>Classification Accuracy</th>
<th>Cox and Snell’s $R^2$</th>
<th>Nagelkerke’s $R^2$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Re-Enrollment</td>
<td>72%</td>
<td>13%</td>
<td>17%</td>
</tr>
<tr>
<td>Retention</td>
<td>81%</td>
<td>15%</td>
<td>23%</td>
</tr>
<tr>
<td>Eight Year Graduation</td>
<td>70%</td>
<td>20%</td>
<td>27%</td>
</tr>
</tbody>
</table>
Data Mining to Examine Persistence
Data Mining to Predict Persistence

12 Month Retention By Enrollment

YES: 93%
NO: 7%
LMS Actions Predicting Performance

The graph shows the engagement index over weeks for different grades (A, B, C, D, and F) from week 1 to week 8. Each line represents a different grade, with A grades showing the highest engagement and F grades showing the lowest engagement. The engagement index decreases over time for all grades, indicating a decline in engagement over the weeks.
# Predicting Persistence Using LMS Actions

<table>
<thead>
<tr>
<th>Predictors</th>
<th>Model Type</th>
<th>Validation Set Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sum of Median Indices</td>
<td>Logistic Regression</td>
<td>$R^2=0.08$  Misclassification: 0.07</td>
</tr>
<tr>
<td>Open Class_DiffIndex Create Response Note_DiffIndex Launch Conference_DiffIndex Read Conference Note_DiffIndex</td>
<td>Bootstrap Forest</td>
<td>$R^2=0.00$  Misclassification: 0.07</td>
</tr>
<tr>
<td></td>
<td>Boosted Tree</td>
<td>$R^2=0.00$  Misclassification: 0.07</td>
</tr>
<tr>
<td></td>
<td>Neural Net</td>
<td>$R^2=0.00$  Misclassification: 0.13</td>
</tr>
<tr>
<td>Open Class_Mean Create Response Note_Mean Launch Conference Note_Mean Reading Conference Note_Mean</td>
<td>Bootstrap Forest</td>
<td>$R^2=0.00$  Misclassification: 0.26</td>
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<td></td>
<td>Boosted Tree</td>
<td>$R^2=0.01$  Misclassification: 0.26</td>
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## Data Sources Predicting Persistence

<table>
<thead>
<tr>
<th>Community College Data Sources</th>
<th>First Term at Transfer Institution Indicators</th>
<th>LMS Engagement</th>
</tr>
</thead>
<tbody>
<tr>
<td>CC GPA</td>
<td>First Term GPA</td>
<td>Difference-from-Median Engagement Indices</td>
</tr>
<tr>
<td>Successful Course Completion</td>
<td>First Term Credits Earned</td>
<td></td>
</tr>
<tr>
<td>Math Enrollment</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Conclusions

• Math course taking at community college is important factor in persistence

• Community college and UMUC factors matter in predicting re-enrollment, retention, and graduation

• Different factors associated with different indicators of persistence
Thank You!