Postcollegiate Outcomes Research: Joining Pieces of the Pathways Puzzle

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University of Minnesota Institutional Research

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Presentation Overview

• Project scope and data highlights
• Working with outcomes data—National Student Clearinghouse and state employment data files
• Employment and further education data—focus on liberal arts majors
• Next steps, lessons learned
We had so many questions.....as do our legislators, parents, students, and accreditors

Where are our graduates working?

How much are they making? By field? By degree level?

Are they in fields related to their major?

How do occupations change over time?

Is the U of M an equalizer for students who come from lower socioeconomic backgrounds?

What does further education look like?

What are the personal and social capital gains of U of M graduates?
What we had....

Each campus and many of the colleges in the Twin Cities doing their own thing.....
U of M Postcollegiate Outcomes Project

- Longer time horizon: 5, 10+ years out—beyond placement
- Systematic approach: system-wide and across all student levels
- Primary data sources—non-surveys, non-self-reported
Better and broader data sources now available….still not complete

Current data sources

- **Statewide Longitudinal Education Data System (SLEDS) – MN**
  Unemployment Insurance info: salary, industry and sector of employment, & hours worked by quarter

- **National Student Clearinghouse** – pursuit of additional education, including and beyond just UMN

- University of MN internal data warehouse tables
Data Overview

How did UM graduates appear in SLEDS?

• UMN completers’ unique students (2006-16): 140,625 from central records vs. 137,968 from SLEDS: **Missing 1.89%**

• Any SLEDS employment data: n=124,721: 124,721/137,968 = **90.4%**

• Any SLEDS employment data 1 year after graduation: 105,181/137,968 = **76.2%**
SLEDS Example: Percentage of UMN Graduates Employed* in Minnesota
Cohort of Students Tracked Over Time Systemwide: Baccalaureate, 2007, N = 8,341

*Number who had any salary data: Outcomes represent only the graduates who worked in Minnesota as identified in the state’s Unemployment Insurance wage records.

Note. UMN Rochester campus, whose first graduating cohort was in 2013, is not included.
SLEDs: Percentage of UMN Graduates Employed in Minnesota: Of those Employed: % Full-Time vs Part-Time
Cohort of Students Tracked Over Time Systemwide: Baccalaureate, 2007, N = 8,341

Note. UMN Rochester campus, whose first graduating cohort was in 2013, is not included.
SLEDS: UMN Alumni Earnings Over Time (2007-2016)
Cohort of Students Tracked Over Time Systemwide: Baccalaureate, 2007, \( N = 8,341 \)

Earnings are based on a calendar year and are inflation-adjusted to reflect 2020 dollars.

Note. UMN Rochester campus, whose first graduating cohort was in 2013, is not included.
Example Clearinghouse: Further Education: UMN System
Degree Received: Baccalaureate, 2007, $N = 8,341$

- 35% or 2,939 graduates received additional degrees/certificates between 2007-2016

Note. Count of graduates.
Example Clearinghouse: Further Education: UMN System
Degree Received: Baccalaureate, 2007, $N = 8,341$

- Of the 35%, 33% received an additional degree/certificate from the U of M and 2% from both the U of M and other institutions

Note. Count of graduates.
Working with Employment and National Student Clearinghouse Data
SLEDS Data Files

Cohort based on all students enrolled at UM between Fall 2003 and Fall 2017

- **Enrollment File**: 1,390,266 rows, 343,665 unique ids
  - One row per person per MN institution and term of enrollment
  - Used primarily to validate the base cohort

- **Completers File** (degrees): 206,536 rows, 168,964 unique ids
  - One row per person per degree received – UM and other MN schools
  - Not very useful – limited information – opted to use NSC data instead

- **Employment File**: 9,770,134 rows, 298,456 unique ids
  - One row per person, per job, per quarter - for employees in MN eligible for UI

- **Re-Identification File**: 343,665 rows
  - Mapping assigned sleds_id back to UM student_id using probabilistic matching
National Student Clearinghouse

- National look at further enrollments of UMN enrollees (both transfer and graduate/professional study)

Submitted to NSC:
- Enrolled at UMN (Fall 2003-Fall 2017): **343,665**
- Batches of 50,000 (seven batches); later successfully used 100,000 batches

Received from NSC:
- 4,039,240 records (multiple rows per person, UMN+non-UMN) of which:
  - 1,798,332 records (multiple rows per person, non-UMN) of which:
    - unique headcount graduated (non-UMN): 115,423
Challenges of Working with NSC Data

Use of non-standardized *institution-specific* definitions:

- Award level: 3,777 different *credential titles*:
- Variations in abbreviations, names, punctuation
- Institution-specific programs
  - **BAMA** = Master’s degree (B.A./M.A. program at NYU and CUNY, which satisfies all of the requirements of both the bachelor’s degree and the master’s degree and culminates in an M.A.)
  - **ND** = Doctoral-professional degree (Doctor of Naturopathic Medicine)
  - **Advanced Standing Diploma** = Undergraduate certificate
  - **Engineer** = Postmaster’s certificate (Ivy League Universities)
  - **Credential** (20 entries) can mean a range of award levels, depending on the institution (e.g. Postmaster’s certificate in a medical field, Subbaccalaureate certificate at a community college)
  - **Certificate (about 10,000 entries)** can mean a range of award levels, depending on the institution (e.g. Postmaster’s, Postbaccalaurete, and Subbaccalaureate certificates)
Challenges of Working with NSC Data

• Use of non-standardized *institution-specific* definitions:
  - Program name (NSC Degree Major):
  - e.g., “SPEC ED EMOT BEHAVIOR DISORDER, ACAD BEHAVIORAL STRATEGIST, BIG DATA”

• Standardized government definitions/codes not provided:
  - CIP codes: a mix of 2000 and 2010

• Detailed documentation not provided (data dictionary, etc.)

• Needed *manual* data cleaning to standardize
  – To determine IPEDS definitions of degree level & program title: look at the institution degree title, program name, CIP code, and *check the website of an institution.*
Data Preparation Steps

• Initial Review of Data – using Ultra Edit
  – Able to sort and select NSC degree records only (enrollment info not needed at this point)
  – Scan data to verify layout and check for abnormalities.

• Upload all files to Oracle data base tables using TOAD
  – Insert original UM student_id into all tables by matching on SLEDS student_id in the reidentification file
    • Created by SLEDS using probabilistic matching (name, birthdate, etc.)
    • Contained some errors including multiple UM_student_id values per sleds_id and vice versa.
    • Corrected on our end via Oracle SQL to get a final 1-1 mapping using random selections
Data Transformation Steps

Use Oracle SQL to merge & manipulate tables

- UM files, SLEDS files, NSC files
- Create Tableau-friendly “vertical” file format (e.g. one row per person, per degree year per employment year)
- Roll up original salary data was from quarter level – to calendar year level
- Complexity - calculating salary data to accurately restart amounts with each degree a student received
- Create final single year cohort file of those who received a UM bachelors degree in calendar 2007 so they could be followed forward.
Postgraduation Outcomes of UMTC Liberal Arts Graduates

Further Education and Career: English and Psychology
Further Education
English Language and Literature, General
Degree Received: Baccalaureate, 2007, $N = 193$

38% (74* graduates) received additional degrees/certificates between 2007-2016

- 119: No Further Education
- 65: One Degree/Certificate After Graduation
- 7: Two Degrees/Certificates After Graduation
- 2: Three Degrees/Certificates After Graduation

*Count of graduates
Further Education
English Language and Literature, General
Degree Received: Baccalaureate, 2007, \( N = 193 \)

74* graduates received additional degrees/certificates between 2007-2016

*Count of graduates

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**Graph Description**

- **30%**: UMN
- **68%**: Other Institutions
- **2%**: UMN and Other Institutions

Note: *Count of graduates*
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*Count of degrees/certificates
Further Education
English Language and Literature, General

*n = 74; 85 total awards*

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<th>Count of degrees/certificates</th>
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</table>

*Count of degrees/certificates*
Further Education
English Language and Literature, General

$n = 74$; 85 total awards

Doctoral-Professional Degrees, $n = 15$

- Legal Professions & Studies: 13
- Health Professions & Related Programs: 2

Master's Degrees, $n = 51$

- Education: 22
- English Language & Literature/Letters: 5
- Library Science: 6
- Business, Management, Marketing, & Related Support Services: 7
- Public Administration & Social Service Professions: 4
- Health Professions & Related Programs: 5
- Theology & Religious Vocations: 3
- Legal Professions & Studies: 1
- Liberal Arts & Sciences, General Studies & Humanities: 1
- Multi/Interdisciplinary Studies: 1
- Social Sciences: 1

*Count of degrees/certificates
Employment

English Language and Literature, General

Degree Received: Baccalaureate, 2007 (academic year), N = 193

Percentage of Graduates Employed in Minnesota: Full-Time vs Part-Time

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<th>Year</th>
<th>Full-Time</th>
<th>Part-Time and Partial Records</th>
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<tr>
<td>2008</td>
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<td>2009</td>
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<td>2015</td>
<td>56%</td>
<td>44%</td>
</tr>
<tr>
<td>2016</td>
<td>61%</td>
<td>39%</td>
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</table>
Employment
English Language and Literature, General
Degree Received: Baccalaureate, 2007 (academic year), N = 193
Earnings Over Time (2007-2016)

Full-Time Earnings

Earnings are based on a calendar year and are inflation-adjusted to reflect 2020 dollars.
Employment

English Language and Literature, General

Degree Received: Baccalaureate, 2007 (academic year), N = 193

Earnings Over Time (2007-2016)

Median Full-Time Earnings

Earnings are based on a calendar year and are inflation-adjusted to reflect 2020 dollars.
Further Education
Psychology, General
Degree Received: Baccalaureate, 2007, \(N = 377\)

48\% (182* graduates) received additional degrees/certificates between 2007-2016

- No Further Education: 165
- One Degree/Certificate After Graduation: 195
- Two Degrees/Certificates After Graduation: 15
- Three Degrees/Certificates After Graduation: 2

*Count of graduates
Further Education
Psychology, General
Degree Received: Baccalaureate, 2007, $N = 377$

182* graduates received additional degrees/certificates between 2007-2016

*Count of graduates

29% 71%

UMN Other Institutions
**Psychology, General**  
**Further Education**  
\[ n = 182 \]

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*Count of degrees/certificates
# Further Education
## Psychology, General

$n = 182; 200$ total awards

### Major Fields

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<th>Field</th>
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<td>Health Professions and Related Programs</td>
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<td>Education</td>
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<td>Public Administration and Social Service Professions</td>
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<tr>
<td>Legal Professions and Studies</td>
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<td>Homeland Security, Law Enforcement, Firefighting and Related Protective…</td>
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<td>Biological and Biomedical Sciences</td>
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<td>Social Sciences</td>
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<td>Computer and Information Sciences and Support Services</td>
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<td>Multi/Interdisciplinary Studies</td>
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<td>English Language and Literature/Letters</td>
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*Count of degrees/certificates*
Further Education
Psychology, General

\[ n = 182; 200 \text{ total awards} \]

**Major Field: Psychology, \( n = 56 \)**

- Counseling Psychology: 21
- Psychology, General: 11
- Educational Psychology: 8
- Industrial and Organizational Psychology: 6
- School Psychology: 3
- Clinical Psychology: 3
- Social Psychology: 1
- Health/Medical Psychology: 1
- Forensic Psychology: 1
- Experimental Psychology: 1

*Count of degrees/certificates*
Further Education Psychology, General
\( n = 182; \) 200 total awards

Doctoral-Professional Degrees, \( n = 22 \)
- Health Professions & Related Programs
- Legal Professions & Studies

Master's Degrees, \( n = 139 \)
- Psychology: 11
- Business, Management, Marketing, & Related Support Services: 27
- Education: 17
- Health Professions & Related Programs: 19
- Public Administration & Social Service Professions: 3
- Biological & Biomedical Sciences: 46
- Computer & Information Sciences & Support Services: 19
- Architecture & Related Services: 19
- Engineering: 3
- English Language & Literature/Letters: 4
- Family & Consumer Sciences/Human Sciences: 17
- Homeland Security, Law Enforcement, Firefighting & Related Protective Services: 17
- Social Sciences: 17

*Count of degrees/certificates
Employment
Psychology, General
Degree Received: Baccalaureate, 2007 (academic year), N = 377
Percentage of Graduates Employed in Minnesota: Full-Time vs Part-Time

[Graph showing percentage of graduates employed full-time and part-time from 2007 to 2016.]
Employment
Psychology, General
Degree Received: Baccalaureate, 2007 (academic year), N = 377
Earnings Over Time (2007-2016)
Full-Time Earnings

Earnings are based on a calendar year and are inflation-adjusted to reflect 2020 dollars.
Employment Psychology, General
Degree Received: Baccalaureate, 2007 (academic year), \(N = 377\)

**Earnings Over Time (2007-2016)**

**Median Full-Time Earnings**

Earnings are based on a calendar year and are inflation-adjusted to reflect 2020 dollars.
Project Next Steps, Lessons Learned
Postcollegiate Outcomes on Campus

• Raising project awareness
  – Senior leadership, system campuses, units across campus
  – Integrating with new systemwide strategic plan
  – Coordinating with other initiatives
    – Expansion of longitudinal alumni outcome survey; effort to focus interests beyond salary

• Data Governance
  – Access, level of aggregation

• Distribution and Usability of Results
  – Working with campus groups
Postcollegiate Outcomes Next Steps

• Updating current data sources
  – SLEDS (2006-19, Q1 2020 UI records): includes expanded employer data, industry, sector; employee location by county
  – Census Bureau’s Longitudinal Employer-Household Dynamics, Post-Secondary Employment Outcomes project
    – Coordinated by state Office of Higher Education
    – Provide national view
    – Potential availability for Minnesota in spring/summer 2022

• Further research questions
  – Outcomes for different student demographic groups
  – Time series analysis: accumulation of other degrees, shift to full-time employment
Discussion and Lessons Learned

• Working with non-standardized data from NSC
• Dealing with sensitivity of data
• Promoting, if not ensuring, consistency across institutional reporting, definitions
• Preparing for broad range of outcomes, definitions of “success”
• Managing demand for data and reporting with capacity
Questions?

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