Completion & Attrition in STEM Master’s Programs

Jerry Weinberg
Associate Provost & Dean of the Graduate School,
Southern Illinois University Edwardsville

R. William Ayres
Interim Dean of the Graduate School, Wright State University
Background to the CGS Pilot Study

- **Rationale for Study**
  - Master’s education is the largest component of graduate education (75% of grad students; 89% degrees conferred)
  - Fastest growing and most diverse component of graduate education.
  - Strategic importance to the economy.
  - Very little known about attrition and completion rates.
4 Key Research Questions

- What are the Characteristics of STEM Master’s Programs?
- What are the completion and attrition rates in STEM Master’s and MBA programs and how do they vary by gender, ethnicity, field, and age?
- Identify reasons why students enroll in master’s programs and the factors that contribute to their success.
- Identify promising practices to help improve student outcomes.
5 Participating Institutions

- Loyola University Chicago
- Purdue University
- Southern Illinois University, Edwardsville
- Texas A&M University
- Wright State University
8 Data Collection Instruments

- Student-level Data Template.
- Program Characteristics Template.
- Online surveys administered to GPDs.
- Focus group sessions with students.
- Group interviews with Deans, GPDs and university personnel.
- Survey of First-Year Students.
- Survey of Graduating Students.
- Survey of Stop-Out and Drop-Out Students.
Summary Data from the Study: 
STEM Master’s Programs

- 2-year completion rate: 41%
- 3-year completion rate: 60%
- 4-year completion rate: 66%
- API: 69%; AA: 55%; H: 60%
- Women: 69%; Men: 65%
- 6-month attrition rate: 10%
- 1-year attrition rate: 17%
- 2-year attrition rate: 23%
- API: 20%; AA: 31%; H: 26%
- Women 20%; Men: 24%

- Median Time to Degree: 23 months
- Median Time to Attrition: 8 months
Wright State Profile

- Large, Comprehensive Research University
- Colleges of: Science & Math, Liberal Arts, Nursing & Health, Education & Human Services, Business, Engineering & Computer Science; Schools of Medicine & Professional Psychology
- ~70 Master’s programs, 7 graduate Doctorates
  - Undergrad enrollment: 13,772
  - Grad enrollment: 3373
- $36 million in sponsored research
Wright State Observations

- On the whole, WSU data conformed to the broader study
  - Complete & Attrition rates nearly identical to study averages; MTD & MTA also the same
- Finances are an issue for about 50% of WSU students
- Work is an issue for most (70% work 30+ hours/week outside of the university)
- Advising is clearly a key factor in success
  - 75%-80% happy with their advisor; 20%-25% not
  - Problems with the University also traceable to advising
Wright State Responses

- Campus-Wide Survey on Advising & Conversation
  - Only 50% of programs have an orientation
  - Only 33% have a handbook for students
  - <50% track registration or tie it to advising
- Graduate Program Director’s Handbook
- Graduate Retention Scholarships Pilot
  - 100% success rate first cohort; selection bias?
- Crisis Response: Sequester-Related Stopgap Funding
- Broader Context: New Ohio Funding Model
SIUE Profile

• PUI; Large Masters Granting Classification
  – From the mission statement: “Southern Illinois University Edwardsville is a public comprehensive university dedicated to the communication, expansion and integration of knowledge through excellent undergraduate education as its first priority and complementary excellent graduate and professional academic programs”

• College of Arts & Science, School of Engineering, School of Nursing, School of Business, School of Education, School of Pharmacy, School of Dental Medicine

• 47 Master’s programs, EDD, DNP, 2 cooperative PhD programs
  – Undergraduate Enrollment: 14,155
  – Graduate Enrollment: 2289

• $30+ million in sponsored projects
  – $8+ million is research

Footnote: At the time of the CGS study I was acting Graduate Dean, Provost was Interim, and a New Chancellor was just starting. CGS study could not have come at a better time!
Advocating Graduate Programs

Regional, national, international recognition for scholarship and graduates

- Success of graduates
  - In industry and academia
  - Presenting work at workshops and conferences
- Engaging outreach activities in K-12
- Supporting and promoting of scholarship
- Engaging in service to the scholarly community

Enhanced graduate experience & Quality graduates

Positive impact on undergrad programs

Externally funded research & projects

Recruitment of quality students
Recruitment of committed, quality faculty
Multi-institutional collaborations

Innovative, high quality graduate programs

Capacity for scholarship
Goals for SIUE

• **First time ever** for collecting data on graduate studies

  – Who are our students?
  – Why are they pursuing master’s degrees at SIUE?
  – How well are the programs serving the students?
    • Completion rates, attrition rates, time to completion
  – What is keeping students from completing?
    • What can we do to improve completion?
    • Reasons for attrition
## Demographics

<table>
<thead>
<tr>
<th></th>
<th>1st Year Students</th>
<th>December Grads</th>
</tr>
</thead>
<tbody>
<tr>
<td>Response Rate</td>
<td>68%</td>
<td>46%</td>
</tr>
<tr>
<td>% Female</td>
<td>59%</td>
<td>45%</td>
</tr>
<tr>
<td>% White</td>
<td>88%</td>
<td>88%</td>
</tr>
<tr>
<td>Marital Status</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Married or Marriage-like</td>
<td>46%</td>
<td>49%</td>
</tr>
<tr>
<td>Children</td>
<td>20%</td>
<td>23%</td>
</tr>
<tr>
<td>Age</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Under 25</td>
<td>61%</td>
<td>41%</td>
</tr>
<tr>
<td>25 – 29</td>
<td>23%</td>
<td>34%</td>
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<tr>
<td>30 or older</td>
<td>16%</td>
<td>25%</td>
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<table>
<thead>
<tr>
<th>Enrollment Status</th>
<th>1st Year Students</th>
<th>December Grads</th>
</tr>
</thead>
<tbody>
<tr>
<td>Full-time</td>
<td>81%</td>
<td>60%</td>
</tr>
<tr>
<td>Part-time</td>
<td>19%</td>
<td>26%</td>
</tr>
<tr>
<td>Mix</td>
<td>-</td>
<td>14%</td>
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<table>
<thead>
<tr>
<th>Work Status</th>
<th>1st Year Students</th>
<th>December Grads</th>
</tr>
</thead>
<tbody>
<tr>
<td>For University</td>
<td>12%</td>
<td>12%</td>
</tr>
<tr>
<td>Outside University</td>
<td>39%</td>
<td>54%</td>
</tr>
<tr>
<td>Self-Employed</td>
<td>2%</td>
<td>0%</td>
</tr>
<tr>
<td>Not working</td>
<td>46%</td>
<td>33%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Work hours per week</th>
<th>(n=67)</th>
<th>(n=38)</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt; 20</td>
<td>31%</td>
<td>24%</td>
</tr>
<tr>
<td>20 or more</td>
<td>66%</td>
<td>77%</td>
</tr>
</tbody>
</table>
Reasons for Enrolling

- Improve Skills and Knowledge
- Increase Opportunities
- Learn More about Area of Interest
- Facilitate Job/Career Change
- As a Stepping Stone for more Education
- Best Option at the Time
- Meet Requirements of Prospective Employer
- Meet Requirements for Current Employer

1st Year Students (n=124)  December Grads (n=57)

Note: Multiple Response option
December Graduates: Contributed to Completion of Program

Motivation/Determination: Great Extent (80%), Moderate Extent (20%)
Program Structure: Great Extent (70%), Moderate Extent (30%)
Family Support (non-finances): Great Extent (50%), Moderate Extent (50%)
Teaching Quality: Great Extent (50%), Moderate Extent (50%)
Being Full-time Student: Great Extent (40%), Moderate Extent (60%)
Supportive Faculty: Great Extent (30%), Moderate Extent (70%)
Peer Support: Great Extent (30%), Moderate Extent (70%)
Institutional Financial Support: Great Extent (20%), Moderate Extent (80%)
Advisor: Great Extent (20%), Moderate Extent (80%)
Supportive Employer: Great Extent (20%), Moderate Extent (80%)
Student Loans: Great Extent (10%), Moderate Extent (90%)
Employer Financial Support: Great Extent (10%), Moderate Extent (90%)
Inst/Program Support: Great Extent (5%), Moderate Extent (95%)

n=57
STEM Completion Rates

- 2 year: 30%
- 3 year: 51%
- 4 year: 58%
  - Lowest of the five participating institutions

- Lowest of the low
  - Math and Computer Science: 9%, 35%, 47%
  - Biological Sciences: 10%, 33%, 42%
  - Older students (35+): 9%, 26%, 32%
STEM Attrition Rates

• 6 months: 11%
• 1 year: 18%
• 2 year: 26%

• Highest of the high
  – Math and Computer Science: 17%, 30%, 39%
  – Biological Sciences: 9%, 16%, 29%
  – AA: 11%, 20%, 28%
  – Older students (35+): 18%, 27%, 35%
Salient Observations

• Most frequently noted concern by 1st year and graduating students was work-life balance

• Stop-out/drop-out students were unaware of any program orientation by 65%
  – Math & Computer Science were unaware of any program handbook or information by 56%
  – Graduating students were aware by 78% of program orientation

• Stop-out/drop-out students stated two highest contributing factors for stopping were work-related pressures and program structure.
SIUE Responses

• Coordinator for Graduate Student Retention and Services

• Provide students with the tools to be successful and build on motivation for completion
  – Extensive TA training
  – TA support workshops
    • Dealing with difficult students, TA collaborations, open faculty development sessions
  – Work-life balance workshops
  – Career development workshops
SIUE Responses

• Build graduate student community
  – Graduate Student Advisory Board

• Improve communication of program guidelines and available support services
  – One stop website specific for graduate students

• Critical Reflection on Programs
  – Add completion, stop-out rates to Program Review
SIUE Responses

• Change the university’s mission

  “Southern Illinois University Edwardsville is a student-centered educational community dedicated to communicating, expanding and integrating knowledge. In a spirit of collaboration enriched by diverse ideas, our comprehensive and unique array of undergraduate and graduate programs develops professionals, scholars and leaders who shape a changing world.”