Predictors of Cooperative Research Centers Post-Graduation Success: Update

by

Lindsey McGowen

North Carolina State University
Outline

• Background & Purpose
• Literature
• Methodology
• Preliminary Findings
• Timeline
Purpose of Research

• To assess the extent to which graduated Centers become self-sustaining
• To determine what factors predict Center sustainability post graduation from NSF support
• To assess the extent to which graduated Centers maintain fidelity to their program model
What do we know about sustainability?

- Very little
  - Centers
    - Tiny, inconclusive literature based on ERCs
      - Ailes, Roessner, & Coward (2000): data collected at graduation
      - Mudjamar (2005): ~ informal survey with 50% response rate
  - General literature
    - Modest literature on program sustainability primarily from public health literature
      - Meta analysis (Scherier, 2005)
      - 19 studies; 2 multivariate
**General Program Sustainability Model**

**Organizational Factors:**
- **Fit**
  - Formal structures
  - Resources
  - Admin.
  - Technical expertise

**Program Factors:**
- Implementation quality
- Durability to adaptations
- Proven effectiveness
- Benefits to clients
- Ownership
- Funding
- Research Area

**Individual Factors:**
- Champion roles
- Leadership actions

**Environmental Factors:**
- Stakeholder Involvement
- Alignment
- Branding/Prestige

**Sustainability:**
- Outputs
- Activities
- Structures
Research Questions

• Descriptive Questions
  – What is the status of graduated Industry-University Cooperative Research Centers (I/UCRCs)?
    » Preliminary Results
  – How much sustainability do I/UCRCs achieve in terms of continued outcomes and operations?
    » Data to be collected
  – How much fidelity to the I/UCRC model do graduated Centers maintain?
    » Data to be collected

• Predictive Questions
  – What factors (environmental, program, organizational, individual) predict post-graduation status?
    » Preliminary Results
  – What factors (environmental, program, organizational, individual) predict post-graduation sustainability?
    » Data to be collected
  – What factors (environmental, program, organizational, individual) predict post-graduation fidelity?
    » Data to be collected
The current I/UCRC Population and Participants

- Participants:
  - Any NSF I/UCRC that is beyond the 10\textsuperscript{th} year of funding and...
    - graduated (completed funding cycle)
    - did not graduate but is no longer in the program
    - graduated and was absorbed by another Center
  1. N = 69

Center Life Cycle

Current Centers

“Graduated” Centers

Year

N = 69
Data Sources

- Archival
  - Center structure Reports
  - Process/Outcome database
  - National databases

- Primary Data
  - Key informant Interview
    » Objective info.
    » Source: Current Dir. > Last Dir. > Alex > Eval. > Dean > other
  - Evaluator questionnaire
    » Objective & subjective ratings
### Measuring Center Sustainability: DVs

<table>
<thead>
<tr>
<th>DV</th>
<th>Operationalization</th>
<th>Coding</th>
<th>Data Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>Status</td>
<td>Graduated (&gt; 10 years) Drop out (&lt; 10 yrs)</td>
<td>Yes/no</td>
<td>CD Report</td>
</tr>
<tr>
<td></td>
<td>Survival: exists as a research entity with some extramural support and at least 3PIs and 1 student</td>
<td>- Alive, dead, merged - Years survived</td>
<td>Key Informant Interviews</td>
</tr>
<tr>
<td>Sustainability</td>
<td>- Activities Funding Members Faculty Students Graduates Papers Presentations IP</td>
<td>Yes/no</td>
<td>Key Informant Interviews</td>
</tr>
</tbody>
</table>
# Measuring Center Sustainability: DVs

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</thead>
<tbody>
<tr>
<td>Fidelity</td>
<td>Core: University based industrial support consortia external finding multidisciplinary stakeholder meetings</td>
<td>Scale score</td>
<td>Key Informant Interviews</td>
</tr>
<tr>
<td></td>
<td>Secondary: LIFE external evaluation industry selects research</td>
<td>Scale score</td>
<td>Key Informant Interviews</td>
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Validation of DV categories: What do these centers look like?

- **Drop Out**
  - **Alive**
    - Hydrogen Center: dropped out after 7 years b/c firms did not like consortia approach; continued for years as a contract research org. with ~$2M budget (**low fidelity**)
  - **Dead**
    - Lymphocyte Tech. Center: dropped out after 4 years due to lack of industry support and terminated operations; sharing IP was a major obstacle

- **Graduated**
  - **Alive**
    - CACC: recently celebrated its 25th anniversary, has 8 companies, ~$1M/year; continues to be a catalyst for research and education (**high fidelity**)
    - Integrated Pest Management: recently passed 17th anniversary; performs research and provides services for federal agencies; ~$2M/year (**low fidelity**)
  - **Dead**
    - Robotics Center: graduated but terminated operations 1 year later; director left and industry went in a different direction
  - **Merged/ Absorbed**
    - Ceramics Center: graduated and then merged with another center and successfully competed for a new IUCRC award; foci of combined centers was sufficiently different to justify a new award; $4.6M in FY2006 (**high fidelity**)
Post-Graduation Status: Preliminary Results

- There are 69 Centers that were started and are no longer funded by the I/UCRC Program
  - 41% did not reach 10 year graduation
    - 29% did not reach 5 year renewal
    - 12% reached the 5 year renewal, but not 10 yr graduation
  - Post funding status will be determined based on future data collection

- [Pie chart showing distribution of dropout status: 59% dropout 1-5 yrs, 29% dropout 6-9 yrs, 12% dropout 10+ yrs]
Preliminary Results: Cohort Effects

Early Adopters may be more likely to sustain the program post graduation. But why?

<table>
<thead>
<tr>
<th>Year Center was Started</th>
<th>N = 25</th>
<th>N = 44</th>
</tr>
</thead>
<tbody>
<tr>
<td>79-91</td>
<td>71%</td>
<td>9%</td>
</tr>
<tr>
<td>92-06</td>
<td>20%</td>
<td>40%</td>
</tr>
<tr>
<td>10+ yrs</td>
<td>44%</td>
<td>16%</td>
</tr>
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- 10+ yrs
- Dropout, 6-9 yrs
- Dropout, 1-5 yrs
## Predicting Sustainability Outcomes

<table>
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<th>IV</th>
<th>Operationalization</th>
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</table>
| Environmental Factors:  | Economic Climate: GDP in last year  
National R&D funding: US R&D spending in last year | O - N  | US Dept of Commerce  
National Science & Engineering Indicators |
| Organizational Factors: | University Mission: Research focus  
Type University  
Cost-sharing  
University R&D Budget | Yes/no  
pub./private  
Yes/no  
%  
$ | Key Informant Interview  
University records |
| Program Factors:        | Status at Last Year Funding: amount; source members  
transition planning  
multi-university  
faculty satisfaction  
Industry Satisfaction  
Fidelity at graduation | $  
count  
count  
yes/no, components  
count  
likert scale  
likert scale | CD Report  
PO Report  
Key informant Interviews  
Evaluator questionnaire |
| Individual Factors:     | Director turnover  
Program champion  
Leadership | #  
yes/no  
likert scale | Key Informant Interviews  
Evaluator questionnaire |
Timeline

- Approved - COMPLETE
- Archival Data Cleaning – COMPLETE
- Sample Identification - COMPLETE
- Literature review – COMPLETE
- Methods - In progress
- Proposal Defense: 2/08
- Data Collection: 2-3/08
- Analysis: 4/08
- Defend: 5/08