Evaluating the Indirect Effects of Self-Sustaining Cooperative Research Centers

Lindsey McGowen & Denis Gray
IUCRC Evaluation Project
North Carolina State University
Outline

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General Context

• Many federal and state programs are launched as “demonstration” projects and/or are provided time-limited funding

• Explicit or implicit goal of these efforts is for programs to sustain themselves post-government funding
  – Similar approach is taken for S&T initiatives

• Very little research on these indirect outcomes and impacts
What are Indirect Outcomes & Impacts?

- Grant Funding Period
- Post Grant Sustainability
- Post Grant Transformed

Indirect Outcomes: Funding Leveraging Industrial Partnering Student Education Research/Innovation

Indirect Impacts: Economic Development Organizational Impacts Commercialization
Purpose of Research

• To assess the status of Centers after their grant ends
• To assess the extent to which Centers maintain fidelity to the I/UCRC model post-funding
• To determine the level of sustainability achieved by graduated I/UCRCs – how successful are they
• To determine what factors predict Center program sustainability post-funding
• To determine the indirect impact of the I/UCRC program as achieved by graduated centers
Literature

• What do we know about Center sustainability?
  – General literature
    » Modest literature on program sustainability primarily from public health literature
      » Meta analysis (Scherier, 2005)
      » 19 studies; 2 multivariate
  – Centers
    » Tiny, inconclusive literature based on ERCs
      » Ailes, Roessner, & Coward (2000): data collected at graduation
      » Mudjamar (2005): ~ informal survey with 50% response rate
    » IUCRC: no systematic information about graduated centers
General Model of Sustainability

• Definition (Shediac-Rizkallah & Bone, 1998):
  – Sustainability is understood as continued program activities, continued benefits to stakeholders, & organizational capacity to continue to support the program once initial federal support is exhausted

• Measure
  – Program activities
  – Benefits to key stakeholders
  – Infrastructure
Background:  
I/UCRC Program

- Oldest CRC program, started 1980
- Time limited funding
- Explicit goal of creating self sustaining Centers
  - “NSF intends to seed partnered approaches to … research, not to sustain the Centers indefinitely. The Foundation intends for Centers gradually to become fully supported by university, industry, state, and/or other non-NSF sponsors. [Centers are expected to] develop a plan to work toward self-sufficiency from NSF” (NSF I/UCRC website, 2006).
- Ongoing evaluation throughout the 10 year grant
  - Data archived back to 1986
- Assumption of success
  - “Over 80% of the centers established under the I/UCRC program continue on as successful centers without NSF funding” (NSF I/UCRC website, 2006)
Method

- **Design**
  - Semi-structured interview protocol

- **Measures**
  - Funding, partners, structure, fidelity, students, research…

- **Participants**
  - **Sampling Criteria**
    - Center received an NSF I/UCRC operating grant
    - Center no longer funded by an NSF I/UCRC operating grant
    - Center graduated and merged with a newer Center
    - Center has not received NSF I/UCRC money for at least 1 year
    - Population N = 73
  - **Respondents**
    - Key Informant hierarchy
    - 1) current director; 2) recent director; 3) director at the time of transition, 4) site director, 5) University official, and/or 6) involved faculty/staff
Center Status
Graduation Status

- There are 73 Centers that were started and are no longer funded by the I/UCRC Program
  - 37% Do Not Graduate
    » did not receive the full 10 yrs of NSF I/UCRC grant
  - 63% Graduate
    » Received 10+ years of NSF I/UCRC grant support
Center Status

1yr Post Funding Status

- Grad: 15% Closed, 85% Operating
- Not Grad: 37% Closed, 63% Operating

Current Status

- Grad: 20% Closed, 80% Operating
- Not Grad: 33% Closed, 64% Operating
Outcome Categories

- Closed: Did not continue to operate (as a center)
- Merged: Joined another existing/graduated I/UCRC
- Sustained: Continues to operate as a research entity, while maintaining at least 2 of the 3 core features of an I/UCRC
  - University based, Industry funded, shared research
- Transformed: Continues to operate, but:
  - Funded under another program, i.e. branded as a new center
  - Absorbed and/or integrated into another pre-existing entity
  - Discontinuous change in research focus
  - Has not maintained at least 2 of the 3 core I/UCRC features
Center Status

N = 73

- 23% Closed
- 34% Sustained
- 18% Transformed
- 16% Merged

77% continued to operate in some form beyond the end of their grant.

66% currently operating in some form.
Indirect Outcomes
Center Life Cycle

Active Centers
(Current Year)

Closed Centers
(Cumulative Record)

* Study sample does not include centers graduated in the last 2 years, information about their current status is not reflected
Investment Leveraging

Direct Leveraging = 1:8
Indirect Leveraging = 1:15

Millions

- Red: Indirect Leveraging
- Yellow: Direct Leveraging
- Blue: NSF
INDUSTRIAL PARTNERING By YEAR: Plus Currently Operating* Graduated I/UCRCs (N = 35)

*Does not include merged centers or those for which current member data is missing
Educational & Research Outcomes

• Students:
  – Over 1200 currently supported
  – Nearly 400 graduate in last year

• Research:
  – Over 600 ongoing projects
  – Over 1000 pubs in the last year
Indirect Impacts
CAPPS/YamCo: Economic Development Impact

• Center Developed new food processing technology
  – Increased quality & safety of food
• Worked with NC Dept of Agriculture to ID tech transfer potential
• Established $6Mil processing plant
• Creates Jobs
• Increases producer profit
  – Reduced processing cost
  – Higher crop yield
WRC/Edison Welding Institute: Organizational Impacts

- Independently operating for over 20 yrs
- Transformed from Research Center to a Non-Profit High-Tech Consulting & Research Org
- Partners with 2500+ Industrial firms & Government Agencies
- Budget: $25Mil
CAPCE/Owens Corning Commercialization Impacts

- Development of a higher quality, safer, more environmentally friendly plastic foam product
- Application for building, transportation, and health care industry
- Testing with Owens Corning demonstrates cost effective feasibility of mass commercialization
- Potential to increase demand for and US share in $2Bil global industry

Lessons Learned & Next Steps

• Lessons Learned:
  – I/UCRCs have a strong history of producing self-sustaining centers
    » 80% of centers that complete their grants are currently still operating
  – NSF’s current I/UCRC Evaluation Project does not capture indirect outcomes & impacts
    » Centers not routinely evaluate post-funding
  – Post-funding evaluation yields rich evidence of program effectiveness

• Next Steps:
  – Multivariate predictive analysis
  – Case Studies
  – Stakeholder ID Impacts
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Contact Lindsey McGowen:
lcmcgowe@ncsu.edu