



Industry/University
Cooperative
Research Centers

Predictors of Cooperative Research Centers Post- Graduation Success

by

Lindsey McGowen

North Carolina State University

Outline



- Background & Purpose
- Literature
- Program
- Methodology
- Preliminary Findings

Background



- Federally supported research centers are typically funded for a time-limited period ~ 10 years
 - Concerns about entitlement
- An explicit goal of some programs, cooperative research centers (CRCs), is to create “self-sustaining” centers
- How effective are CRCs in achieving this goal?

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
 - 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

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
- Sustainability vs. Institutionalization

General Model of Sustainability



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Four categories of factors that influence sustainability. Emphasis on alignment across categories.

- Environmental Factors
 - Stakeholder involvement - IAB, Faculty, University Admin. (Tornatzky & Fleisher, 1990)
 - » Buy-in, network of support, tailoring
 - Alignment
 - » Values, needs, resources, structure, process
 - Branding/Prestige
- Organizational Factors
 - Fit with organization
 - Formal structures
 - Resources (\$, in-kind, facilities)
 - Administrative policies and procedures
 - Technical expertise
- Program Factors
 - Implementation quality
 - Durability to adaptations
 - Proven Effectiveness
 - Benefits to clients
 - Ownership among staff
 - Funding
 - Research area
- Individual Factors
 - Champion roles
 - leadership actions
 - » Entrepreneurial orientation
 - » Relationship management

Research Questions



- What is the status of graduated Industry-University Cooperative Research Centers (I/UCRCs)?
 - Preliminary Results
- What factors (environmental, program, organizational, individual) predict post-graduation sustainability?
 - Preliminary Results
- How much fidelity to the I/UCRC model do graduated Centers maintain?
 - Data to be collected

Why NSF's I/UCRC Program?



- GOAL
 - “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. “ (NSF I/UCRC website)
- NSF-SPONSORED
 - Modest \$ Support (\$130K/YR/CENTER; \$7 MILLION)
 - Receives 90% support from industry, state, other federal
- MODEL
 - University-based (faculty & students) research center
 - Industrial consortium (membership: \$30-50K/YR)
 - Involves multiple sites: 50+; 600+ firms
 - **Ongoing evaluation**

Question by Source by Variable Table



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Research ?s	DV	IV	Data Source
Status?	<ul style="list-style-type: none"> Dropout – alive Dropout – dead Graduated – alive Graduated – dead Graduated - merged 		Archival Data: CD Reports Interviews: Center Director and/or Evaluator
Predictors?	Sustainability: Activities Benefits Capacity	program adaptability, program champion, fit, benefits to staff/clients, stakeholder support, funding	Archival Data: CD Reports PO Reports Interviews: Center Director and/or Evaluator
Fidelity?	Continued Core Components (hi/med/lo): Industry support Consortia format Shared research & IP Strong industrial influence		Interviews: Center Director and/or Evaluator

What do these centers look like?



- **Status:**

- Drop out – alive

- Hydrogen Center: dropped out of IUCRC after 7 years because firms did not like consortia approach; continued for many years as a contract research organization with ~ \$2M/year budget (low fidelity)

- Drop out – dead

- Bio Pharma Center: dropped out IUCRC after 4 years due to lack of industry support and terminated operations; sharing IP was a major obstacle

- Graduated – alive

- Communications Center: recently celebrated its 25th anniversary, has 8 companies, ~\$1M/year; continues to be a catalyst for research and education.
- AgroChem Center: recently passed 17th anniversary; performs research and provides services for federal agencies; ~\$2M/year (low fidelity)

- Graduated – dead

- Robotics Center: graduated from IUCRC but terminated operations 1 year later; director left and industry went in a different direction

- Graduated – merged/ absorbed

- Ceramics Center: graduated from IUCRC 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.

The current I/UCRC Population and Participants

Participants:

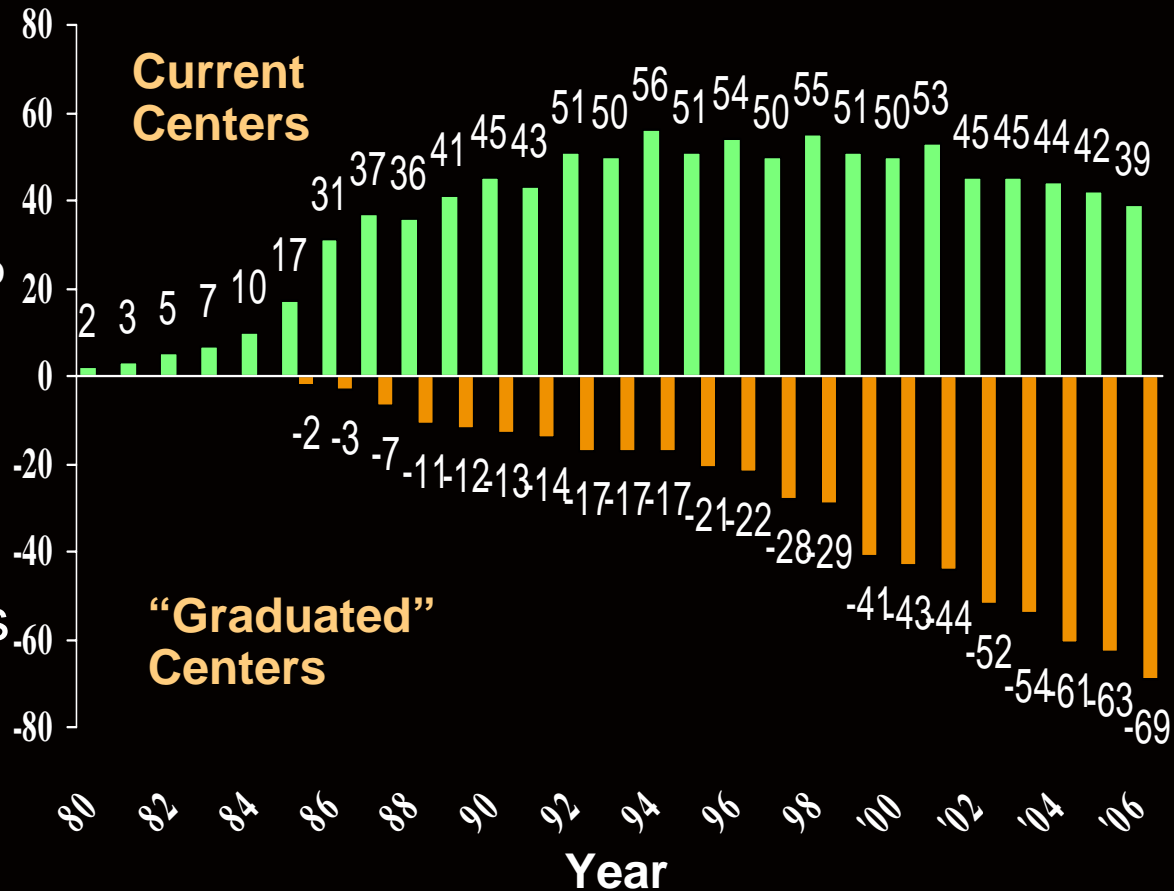
– Any NSF I/UCRC that is beyond the 10th year of funding and and ...

- » graduated (completed funding cycle)
- » did not graduate but is no longer in the program
- » graduated and was absorbed by another Center
- » N = 69

• “Over 80%” of the Centers established continue on as successful centers without NSF funding”

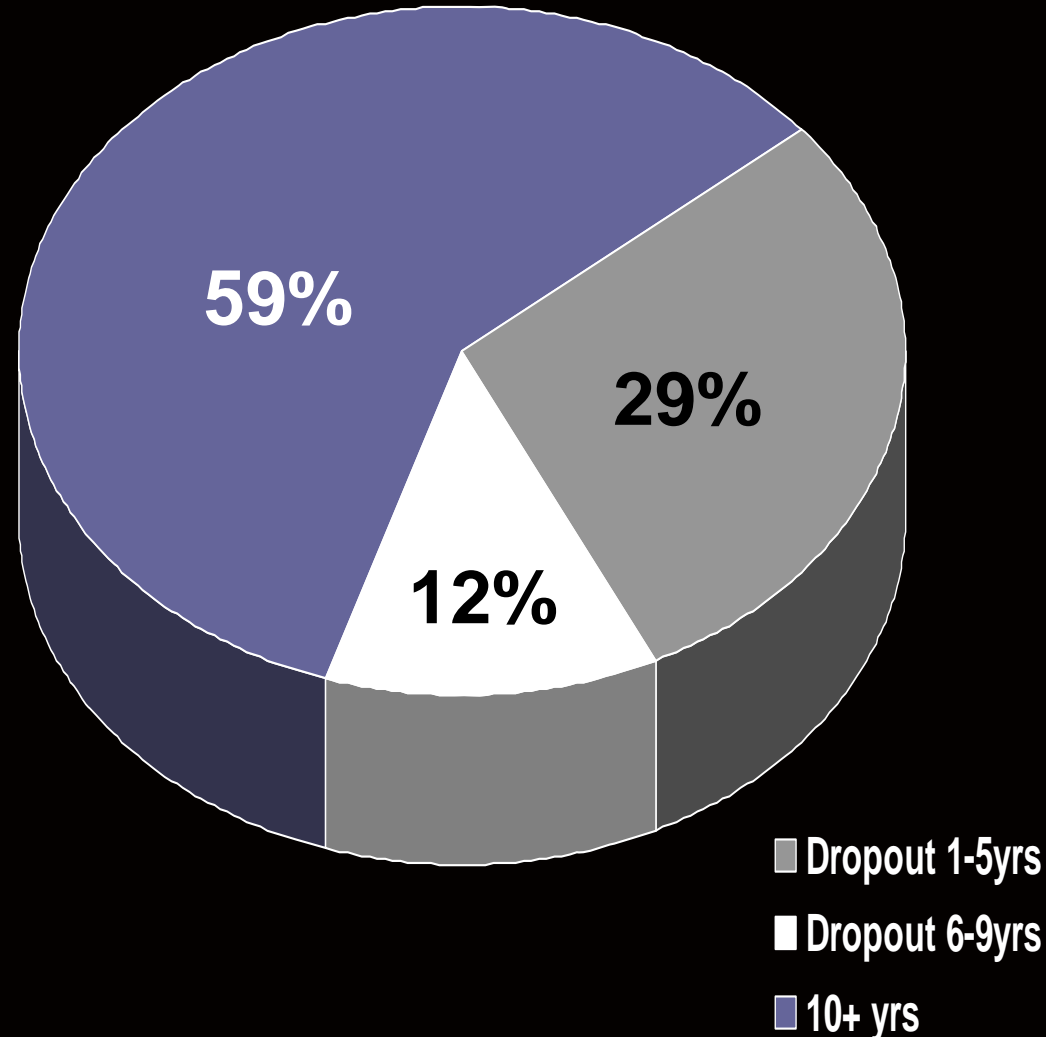
(NSF I/UCRC website).

Center Life Cycle

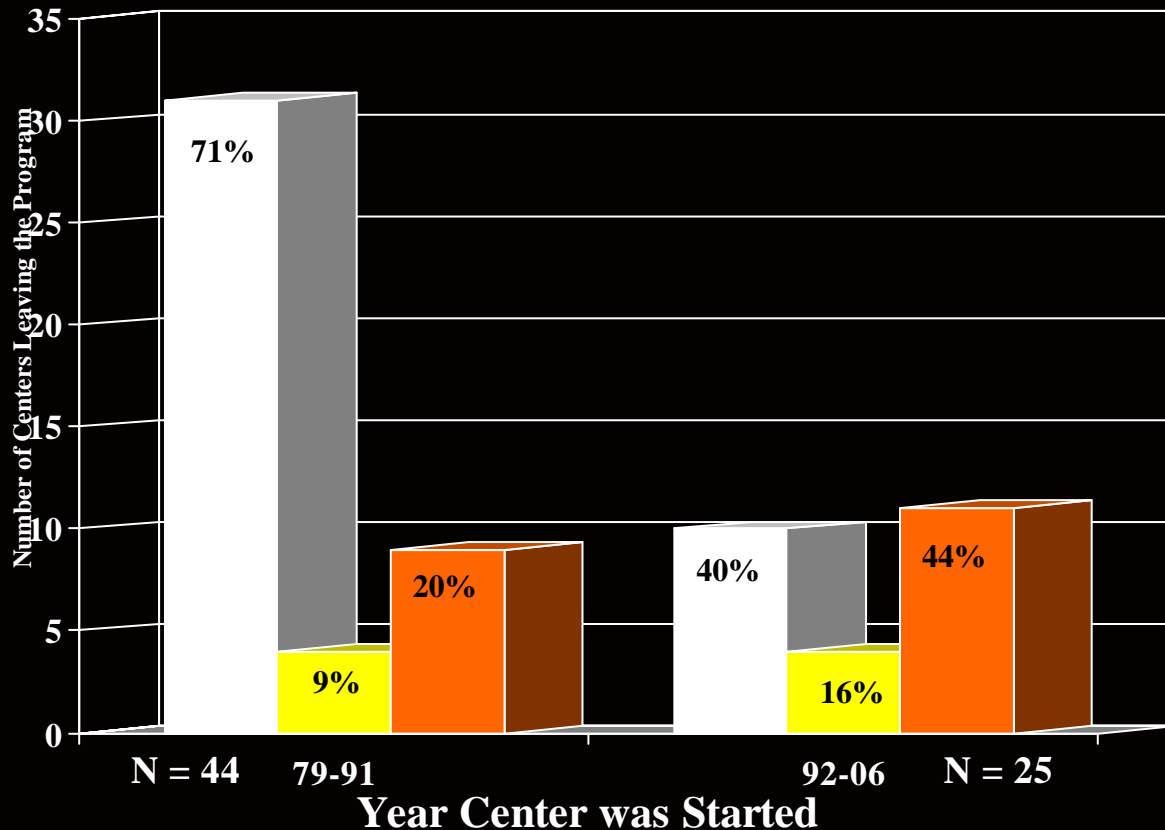


Post-Graduation Status: Preliminary Results

- 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
 - The status of the remaining 59% that did reach 10 year graduation will be determined based on future data collection



Preliminary Results: Cohort Effects

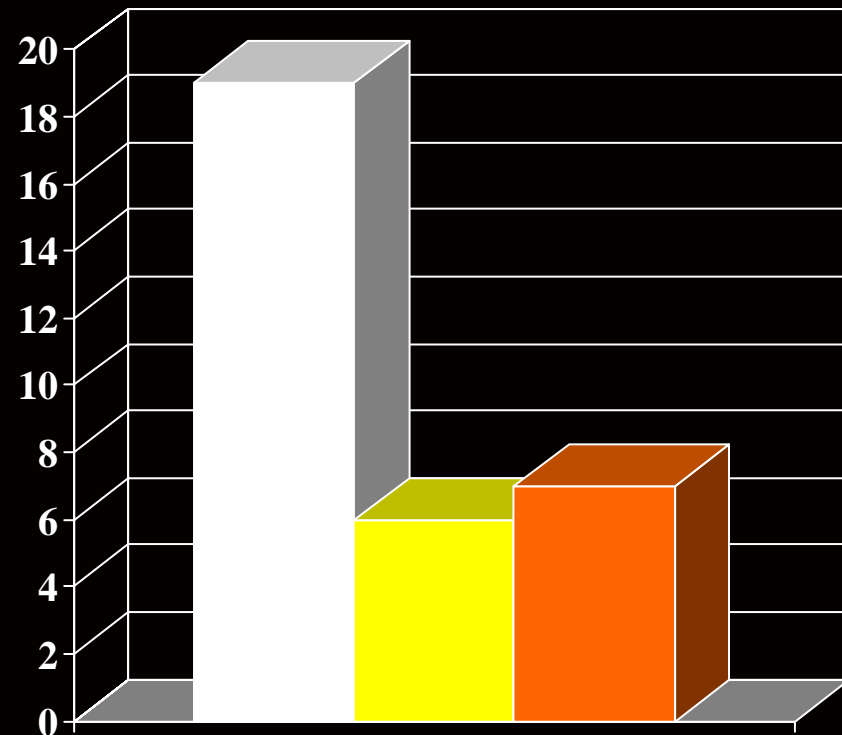


Early Adopters may be more likely to sustain the program post graduation. But why?

■ 10+ yrs ■ Dropout, 6-9 yrs ■ Dropout, 1-5 yrs

Predictors of graduation status: Preliminary Results

- DV:
 - NSF Funding Status
 - » Funded < 5 years
 - » Funded 6-9 years
 - » Funded > 10 years
- IVs:
 - Average annual NSF \$
 - Industry membership \$ in final year
 - Number of funding source types in final year
 - Number of Industry members in final year
- Results of Multinomial Logistic Regression
 - # Industry Members: Significantly predicts graduation status ($p < .001$)



Mean # Industry Members in Final Year

■ 10+ years ■ 6-9 years ■ 1-5 years

Summary & Conclusions



- Achieving self-sustainability is an important and explicit I/UCRC goal
 - Facilitates long-term outcomes/benefits
- Level of sustainability is unclear, but...
 - Fewer Centers than expected graduate
- Inside the Black Box
 - Evidence of a cohort effect
 - Stakeholder investment outweighs the importance of funding in determining sustainability
 - Complete picture at next year's AEA...

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Contact Lindsey McGowen:

lcmcgowe@ncsu.edu