Graduated IUCRCs: Case Studies

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IUCRC Evaluator Meeting

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Outline

• Brief Review of the Graduated Centers Study
  – Quantitative analyses

• Qualitative Analyses
  – Why Centers unravel
    • Four cases
  – How do center’s sustain themselves
    • Steel
    • Polymers
    • Communications
    • Welding

• Lessons Learned
Program Sustainability

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

• Review of the literature indicates that sustainability can be measured in a variety of different ways and influenced by a variety of factors at multiple levels…. It’s complicated.
Graduated Centers: Quantitative Analysis

• Goals:
  – Descriptive
    • To determine the status of I/UCRCs post-funding
    • To determine how much fidelity to the I/UCRC model sustained centers exhibit
    • To determine the level of sustainability centers have achieved in terms of continued program activities, structures, and outcomes
  – Predictive
    • To determine what factors predict center status
    • To determine what factors predict fidelity to the IUCRC model
    • To determine what factors predict the level of sustainability centers have achieved in terms of continued program activities, structures, and outcomes
Graduated Centers: Post-funding Status

- 1 Year Post Graduation Status
  - 53 sustained
  - 17 not sustained

- Current status
  - 44 operating
  - 26 not operating
Graduated Centers: Fidelity

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<th>%</th>
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<tr>
<td>industrial support</td>
<td>96.2</td>
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<tr>
<td>university based</td>
<td>94.3</td>
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<tr>
<td>Tech Transfer</td>
<td>94.3</td>
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Structural Fidelity Mean: 0.75

- stakeholder meetings 69.8
- membership fees 67.9
- IAB 67.9
- consortial results dissemination 64.2
- consortial project selection 50.9

Assessment Fidelity Mean: 0.21

- Evaluator 17.0
- LIFE 17.0

- Industry support, university based, and tech transfer are almost universal across sustained centers
- EFA yielded a 2 factor solution, but…
- These measures of fidelity may not fully capture the various organizational forms and identities of formerly funded I/UCRCs….
### Graduated Centers: Predictive Findings

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<tr>
<th>Post-grad status</th>
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<tr>
<td>Current status</td>
<td>+</td>
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<tr>
<td>Assessment fidelity</td>
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<td>Structural fidelity</td>
<td>+</td>
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<tr>
<td>Current members</td>
<td>+</td>
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<td>Current budget</td>
<td>+</td>
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<td>Current IP</td>
<td>-</td>
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<td>Current grad students graduating</td>
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- Predictive results are somewhat underwhelming…
- Based on quantitative analyses, we learned a lot about the rate of sustainability but just a little about why/how of success/failure
Qualitative Case Studies
Graduated Centers: Qualitative Analyses

• Goals and Objectives:
  – To try to get a better understanding why some centers sustain
  – To try to get a better understanding how centers sustain

• Methodology
  – Opportunistic analysis of archival data for 4 cases
    • When Triple Helix Unravels: Learning from failure in case studies of industry-university cooperative research centers (Gray, Sundstrom, & McGowen, in press; Industry and Higher Education)
  – Structured interviews with four strategically selected success cases
Triple Helix Unravels

• 4 failure cases + 1 sustained from interviews
• Cases:
  – Two failed within 1-4 years
  – Two failed within 5+ years
• Conclusions: Multiple Flaws
  – Structural weaknesses: no doctoral programs
  – External factors: industry with exclusive IP interests; lack of absorptive capacity in firms
  – Lack of institutional support especially during transitions
  – Lack of leadership/ Botched succession planning
• IUCRCs fail for a number of different reasons, and they succeed for a number of different reasons in a variety of forms
• The following cases illustrate the diverse paths to program sustainability for IUCRCs
Case 1:
Advanced Steel Processing & Products Research Center
ASPPRC: Sustained with Fidelity

- IUCRC Founded: 1984
- Host Univ.: CO School of Mines
- Members: 7
- Center continues to operate using the IUCRC model
- Supported solely by industry and Univ. – no gov’t support
- Successfully adapted to globalization and consolidation in industry
ASPPRC: Sustained with Fidelity

- Center has maintained fidelity to the IUCRC model while adding some **minor** organizational innovations
  - IAB not only selects research projects, but also approves center operations, staffing, and budget
  - 3 research thrust areas
    - New projects in each area are identified at the request of the steering committee for that area
  - Automatic membership fee increase every 2 yrs
  - Extra Designated Research Projects
    - Funded by individual members, Only 7% of total Center budget ~ $1.6M
  - Very “In the Field” orientation
ASPPRC: Globalization & Consolidation

• Currently has 20+ members around the world...

• This transition has required managing different cultural expectations about I-U collaboration and emphasizing communication

• Corporate reshuffling has also required ASPPRC to maintain close connections to their champions w/in organizations
ASPPRC: Sustainability Factors

- Center very well aligned with Univ. mission and research funding model
  - Univ. also highly supportive in terms of indirect, recruitment of internationally renowned researchers, administrative support, and state of the art facilities

- Balancing Adaptability with Fidelity
  - ASPPRC has maintained core features of the IUCRC model while adapting to changes in the industry they serve

- Center’s leadership transitions well managed: founding CD worked closely with and groomed current CD
  - Preserved organizational processes and structures in the face of industrial turmoil
  - Univ. has already hired current CDs future replacement
Case 2: UMass/Industry Research on Polymers
CUMIRP: Fidelity Plus

- IUCRC Founded: 1980
- Host Univ.: UMass
- Members: 13
- Center housed in one of the top Universities in its field
- Center continues to operate using the IUCRC model, but has added several organizational innovations to meet the needs of member companies
- Center has contributed significantly to the TT policy of the univ. and operates its own TT office
  - Also played significant role in formation of IUCRC policy on TT
- CDs have always had close connection and involvement with industry
CUMIRP: Adaptation & Fidelity

- Changes in industrial business model and declining membership required CUMIRP to expand and reinvent
  - CD position became full-time
  - Mini-consortia (i.e. clusters) focused around research areas; vary over time based on industrial interest
    - Clusters directed by steering committees
    - The IAB now acts in an advisory/advocacy function; by invitation only
  - New fee structure depending on # of clusters participated in and company size
  - Added a 1) contract research component, 2) unrestricted grant component, and 3) a short term scoping project component
    - Competing successfully for PFI
  - Center facilitates sponsored research and grants
  - Univ. agreed to a costs structure to provide for self-funding of the Center
CUMIRP: Sustainability Factors

- Adapted model to meet industry needs
- University support in terms of operational flexibility and support of CD
- Long-term CD allows for continuity in the face of changes in univ. admin.
- CD also maintains relationships with multiple contacts and various levels w/in member firms
- Integrated partnerships with other research units/centers/institutes on campus
- State of the art facilities
- Recognition of the impact the center has on the univ., faculty and students
Case 3:
Center for Advanced Communications
CAC: Transformed

- IUCRC Founded: 1990
- Host Univ.: Villanova Univ.
- Members: 6
- Center housed in a small private univ. with minimal focus on research; No PhD Programs
- Center associated with a state tech. focused economic development program: Ben Franklin Technology Partners
- When NSF funding ended and founding director died, the center had lost almost all members and funding
- Center now operates as a contract research org. conducting research in 4 thrust areas
- Center instrumental in the development of a PhD program in EE
CAC: Sustainability Factors

• Now operates with a $2.5M budget based on industrial contracts and gov’t grants

• Success was achieved by:
  – Establishing 4 state of the art multi-million $ research labs
  – 3 new research faulty positions
  – University allowed CAC to keep ½ of all indirect
  – Research area is one of the fastest growing and most influential of the 21st Cent.
  – NSF PFIs established CAC as an important partner with several federal labs, academic institutions, and firms

• Realized it could not survive as consortial center but could prosper as a contract research organization closely aligned with state/local economic development goals
Case 4:
Center for Welding Research
Center for Welding Research: Transformed

- IUCRC Founded: 1980
- Host Univ.: Ohio State
- Members: 9
- Center transformed from and IUCRC into EWI
- Organizational Context:
  - Well aligned with OSU strengths & regional industry, and economic development plans
  - Welding Department strategic planning focused around developing an industrially relevant welding center
  - CD worked as a champion for the center’s inception
From CWR to EWI

- Thomas Edison Technology Centers program launched in 1983
  - CRW Director was involved in a proposal to fund EWI and helped to foster the transition from CWR to EWI
- Transition to EWI was important because there was a need in the region and in industry for more applied research than is dictated by the IUCRC model
  - CWR was an academic partner with EWI intended to be the successor org.
  - EWI founded 1984
EWI

- Independent 501(c)3
- Focus on Service:
  - Contract research, consulting, technical assistance, technical library, member-only website, newsletter, and discounted courses/seminars
  - larger scale industry base, variable membership fees
  - ALSO included longer-term cooperative research and an IAB

- By 1987 Dr. Graff was CEO of EWI; CWR completely absorbed
- Multi-million $ facilities expanded
  - Funded through multiple state, federal, and university sources

- Current Members: ~250
- Current Budget: ~ $25M
EWI: Sustainability Factors

• Continuity in Executive Leadership
  – CD involved in inception of CWR and EWI as well as the transition and post transition periods

• State Technology Based Economic Development
  – OSU and the Edison Program are unique in terms of their endurance over time

• OSU Support
  – Centers well aligned with univ. mission
  – Univ. strategically positioned itself to be a catalyst for regional economic development through funding and partnership with key players

• NSF Staff Support
  – NSF saw the bigger picture of fostering technological growth and helped support the transition from IUCRC to Institute

• Intriguing Development
  – EWI is in the process of becoming a member of the new joining centers at OSU; feel need to support training of new generation of grad students
Lessons Learned

- IUCRC model contributes to long-term sustainability
  - 62% after 20+ years is high rate
- Centers sustain for a number of reasons:
  - Quantitative: Structural issues, money, and members
  - Qualitative: Adaptability, environmental/institutional fit, stakeholder support, facilities, **leadership, leadership, leadership**
- Sustained centers via multiple paths
  - Most are high fidelity IUCRCs
  - Transformation
    - Minor tweaks → Major reinvention
    - State economic centers of excellence; contract research organizations
Questions?

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