Highlights of Survey Data
FY2017
IUCRC Evaluation Project
June 15, 2018

Lindsey McGowen, PI
Olena Leonchuck & Angela Stoica
North Carolina State University
Overview

• Response rate
• Industry Findings
• Faculty Findings
• Student Findings
• Questions & Discussion
• Draft New Student Survey: For Evaluator Feedback
## FY2017 Response Rates

<table>
<thead>
<tr>
<th></th>
<th>Center Level</th>
<th>Individual Level</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Pulse</td>
<td>Benefits</td>
</tr>
<tr>
<td>Continuing Population from CD report</td>
<td>70</td>
<td>70</td>
</tr>
<tr>
<td>1st Year Reporting Population from CD report</td>
<td>+2</td>
<td>+1</td>
</tr>
<tr>
<td>Retired/Defunct Centers</td>
<td>9</td>
<td>9</td>
</tr>
<tr>
<td>Retired/Defunct Centers Reporting [1]</td>
<td>+2</td>
<td>+2</td>
</tr>
<tr>
<td>Population [2]</td>
<td>65</td>
<td>64</td>
</tr>
<tr>
<td>Centers That Did Not Return Data [3]</td>
<td>7</td>
<td>15</td>
</tr>
<tr>
<td>Available Population [4]</td>
<td>58</td>
<td>49</td>
</tr>
<tr>
<td>Data Received</td>
<td>58</td>
<td>49</td>
</tr>
<tr>
<td>Received / Population</td>
<td>87.69%</td>
<td>76.56%</td>
</tr>
<tr>
<td>Received / Available Population</td>
<td>100%</td>
<td>100%</td>
</tr>
</tbody>
</table>

\[1\] Retired/defunct Centers are not required to submit data, but some do. If so, those data were included in the analysis. This year, a previously graduated Center that was not included in the FY2017 population from the CD report also reported data. Their data are counted in the individual counts, but not the center level.

\[2\] Population was defined as centers that were at least 1 year old.

\[3\] Centers were excused for reasons such as being in the midst of center restructuring, high respondent turnover, and respondent refusal to complete surveys.

\[4\] Numbers based on population minus excused and not returned counts.
Industry Response Rate

Industry/University Cooperative Research Centers

Center Level Received/Available Population
Center Level Received/Population
Individual Level Received/Available Population
Individual Level Received/Population

IUCRC Evaluation Project at NCSU

= Pulse
= Benefits
Industry Pulse Survey

Select Results
Industry Satisfaction

![Graph showing satisfaction levels for Center Research, Center Administration, and Center Meetings from 2007 to 2017. The graph indicates a general trend of satisfaction across the years, with Center Research showing a slight increase in the latest year.]

* Previous years data reflect ratings of research quality.
Areas for Improvement

“Academic leads and IAB members need to work more closely together to recruit, especially at conferences. It may become easier when the results get presented at conferences.”

“The group can work together to improve project results reporting and archiving, access to results, and technology transfer”
Renewal Intentions

*Response Categories include: Definitely Not (1), Probably Not (2), Uncertain (3), Probably Yes (4), Definitely Yes (5)
## Predicting Renewal Intentions

<table>
<thead>
<tr>
<th></th>
<th>Likelihood to Renew</th>
</tr>
</thead>
<tbody>
<tr>
<td>Satisfaction: Center Research</td>
<td>.305**</td>
</tr>
<tr>
<td>Satisfaction: Center Administration</td>
<td>.231*</td>
</tr>
<tr>
<td>Satisfaction: Center Meetings</td>
<td>.175**</td>
</tr>
<tr>
<td>Improve: Project Selection</td>
<td>-.139**</td>
</tr>
</tbody>
</table>

*Note. *p<.05, **p<.01*
Comments for NSF

- “This is one of the greatest opportunities to bring industry, academia and government together and we have to work to keep it together.”

- “I recently learned that NSF stopped providing assistance to STTR/SBIR companies for membership fees. I think it's a great mistake. The centers are excellent opportunities for SBIR/STTR companies to outreach their technology to seek cost-effective technical partnership for further R&D beyond original SOW as well as commercial partnership opportunities with other member companies.”

- “The center is great but still needs to improve integrating industries' interests. Otherwise it is hard to recruit and convince additional members to join the center.”
Industry Feedback: Pulse Survey

"Might be good to include metrics that you can track for improvement of the center over time. This is useful for pulse surveys. One suggestion is a Net Promoter Score."

"Consider using numerical ranking system. Also include a space for 'wish list'."

"Query relevance level of overall research to the organization/industry in the survey."

"The question, "Have you received benefits of participation" should have drop-down choices and/or scale of benefits"

"Have a section asking the users for additional questions that they would like to see included in the survey. These can be reviewed and used to update the structure of the survey in line with users' views."
Industry Benefits Inventory

Select Results
Networking Benefits

“Our membership has been a critical part of almost every business relationship we currently enjoy. Absolutely irreplaceable in the growth and maturation of our company.”

“We have gained improved access to University faculty and staff for grant collaborations above and beyond the [Center] projects.”

“The interns provide fresh, state-of-the-art knowledge to our organization.”

“We have leveraged human resources and expertise from industry otherwise unavailable to us.”

“We have two collaborations with IAB members (large companies) that have directly emerged from prior center research and win-win opportunity assessment.”
Students Hired

Average Students Hired per Member Firm

0.54 0.26 0.24 0.33 0.31 0.38 0.31 0.39 0.34 0.30 0.15

0.15/Member
0.95/Center
45 Program Wide

IUCRC Evaluation Project at NCSU
Research Relevance of the Average Member

- Not Relevant Research: % of projects that are probably not relevant to your organization's current or future needs
- Adjacent Research: % of projects that are potentially relevant to your organization's current or future needs, but in an area that is outside your organization's current focus
- Core Research: % of projects so relevant to your organization's current or future needs that your organization would almost certainly have conducted or contracted out a similar project within the next couple years
- Transformational Research: % of projects that are potentially relevant to your organization's current or future needs, but too risky/blue sky for internal investment
Research Cost Avoidance

• Definition: Research cost avoidance is savings a firm obtains by having “necessary” research projects performed by a center rather than performing them internally.

• Example: If a firm reports that a particular “necessary” project would cost $100,000 to carry out internally (counterfactual estimate) but that project was actually carried out by a center to which they pay a $50,000 membership fee that firm has avoided $50,000 of R&D costs.

• RCA = N of Proj. Avoid x Scien. Months x $/Scien. Months (Gray & Steenhuis, 2003)
  • N of Proj. Avoid = N of Center projects (CD report) X % Core projects (Benefits Inventory)
  • N Scientist months = 5 year median
Mean Research Cost Avoidance (in thousands)
## Total Research Cost Avoidance (in thousands)

<table>
<thead>
<tr>
<th>Year</th>
<th>Cost (in thousands)</th>
</tr>
</thead>
<tbody>
<tr>
<td>12 (N = 314)</td>
<td>$153,090.70</td>
</tr>
<tr>
<td>13 (N = 385)</td>
<td>$219,902.29</td>
</tr>
<tr>
<td>14 (N = 340)</td>
<td>$237,449.20</td>
</tr>
<tr>
<td>15 (N = 450)</td>
<td>$278,502.05</td>
</tr>
<tr>
<td>16 (N = 327)</td>
<td>$187,585.95</td>
</tr>
<tr>
<td>17 (N = 273)</td>
<td>$184,699.07</td>
</tr>
</tbody>
</table>

IUCRC Evaluation Project at NCSU
R&D Impacts: 2017

“...We have saved 3x our fee in development costs.”

“The models developed in partnership with [Center] have reduced our internal forecast error by 60%, allowing the company to more confidently set budgets and targets.”

“Allowed us to pursue a necessary research path without adding personnel or starting a new contract. Saved 1 full time employee worth of work ($300k) and yielded results about 8 months earlier than alternate options.”

“The most useful benefit has been providing additional insight on fundamental aspects of technologies... This knowledge has informed project decision making and helped guide current projects. Additionally, projects have allowed us to look at low TRL projects and determine their potential...”

“Most important benefit is to increase our organization’s capability... It's not the time or money saved; it is the possibility of higher quality medicine we develop, that is priceless!”
R&D Impacts: Trend Over Time

- Helped accelerate the pace and/or completion of some R&D projects now underway at (or contracted by) your organization
- Helped your organization decide against starting one or more new R&D projects that otherwise would have been initiated
- Triggered development of new R&D projects, or significantly redirected pending projects within your organization
Technology Translation Benefits

“Technology transfer has happened between the center and the [industry regulator] which impacts our organization. We find this work tremendously valuable.”

“We see the potential to utilize devices produced by two projects in pre-clinical trials which could set us ahead in terms of incorporating the technologies and potentially licensing and leveraging the devices for creating new therapies.”
Commercial & Financial Benefits

“We have developed new product conceptualization from examples prepared by center researchers.”

“We launched an updated version of our initial product. The center helped to independently validate the technology, speed to market and provide research results to the community.”

“Research projects contribute directly to our ability to maintain current jobs in our organization.”
Center Contribution to Commercial Outcomes

- 30%: the center played a critical role in realizing these benefits
- 61%: the benefits would have been delayed without the center’s involvement
- 9%: the center had only limited influence on our ability to realize these benefits
Industry Feedback: Benefits Survey

“Identify benefit, if any (members of Gov't and non-profit institution) in participating CSR.”

“Quantifying the amount of time or money saved would be difficult to answer. Rather suggesting to give rating.”

“replace free-form answers with multiple choice”

“The questions have a "manufacturing feel" in their wording and focus. They do not feel quite right for R&D work in the ASIC/SoC field.”

“We anticipate benefits in the future but haven't realized them yet. Survey could perhaps capture this”
## Predicting Member Benefits

<table>
<thead>
<tr>
<th>Member years</th>
<th>Launched new products/services</th>
<th>Improve existing products/services</th>
<th>None of these benefits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Commercial or financial benefit: Improve existing product/services based on what you learned from the center</td>
<td>0.163***</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Commercial or financial benefit: None of these benefits</td>
<td>-0.135*</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Developed partnerships with other IAB members</td>
<td></td>
<td>0.152**</td>
<td>-0.178**</td>
</tr>
<tr>
<td>Hired any students as a full-time employee, contractor, intern</td>
<td></td>
<td>0.283**</td>
<td>0.136*</td>
</tr>
<tr>
<td>Networking: None of these benefits</td>
<td></td>
<td>-0.155**</td>
<td></td>
</tr>
</tbody>
</table>

Note. *p<.05, **p<.01
Faculty Questionnaire

Select Results
Faculty Long and Short Forms

<table>
<thead>
<tr>
<th></th>
<th>Long Form</th>
<th>Short Form</th>
</tr>
</thead>
<tbody>
<tr>
<td># of items</td>
<td>13</td>
<td>6</td>
</tr>
<tr>
<td># of questions in common</td>
<td>6</td>
<td>6</td>
</tr>
<tr>
<td># of unique questions</td>
<td>7</td>
<td>0</td>
</tr>
<tr>
<td># of centers using form</td>
<td>17</td>
<td>17</td>
</tr>
<tr>
<td>Sample size</td>
<td>165</td>
<td>104</td>
</tr>
</tbody>
</table>
Faculty Satisfaction

- **Very Satisfied**
- **Quite Satisfied**
- **Somewhat Satisfied**
- **Slightly Satisfied**
- **Not Satisfied**

![Graph showing faculty satisfaction over years from 2007 to 2017 with categories for research quality, research relevance, and center administration.](image-url)
Faculty Benefits

Very High Impact

High Impact

Moderate Impact

Slight Impact

No Impact

The feeling of accomplishment I get from the research I do
Opportunities for research contracts/grants
Recognition I receive for the work I do
Access to useful equipment
Ability to support graduate students
Ability to publish my work in quality proceedings and journals
Faculty Commitment to submit best research ideas in a center funded proposal

- Definitely Yes
- Probably Yes
- Uncertain
- Probably Not
- Definitely Not
Student Questionnaire

Select Results
Satisfaction with Center Experience

- Technical quality of research
- Communications between students and industrial scientists
- Communications between students and faculty
- Communication among the students
- Opportunity to learn about research in industrial settings
- Opportunity to participate in applied research

1.00
1.50
2.00
2.50
3.00
3.50
4.00

15-16
16-17
Comparative Evaluation

- Technical quality of research
- Communications between students and industrial scientists
- Communications between students and faculty
- Communication among the students
- Opportunity to learn about research in industrial settings
- Opportunity to participate in applied research
How Should These Survey Results be Used?

- Trends are probably much more interpretable at local center level
  - Director leaves; research direction changes; move from one-on-one to consortial center
- Benchmark center against previous year and national norms
  - By comparing means and standard deviations, evaluators can see how their centers compare to national “norms”

Questions?