FINAL REPORT

NSF WORKSHOP ON UNIVERSITY-INDUSTRY ENGAGEMENT OUTSIDE MAJOR METROPOLITAN AREAS AND MEGACITIES: IDENTIFYING ISSUES AND FINDING SOLUTIONS

May 21-23, 2019

Fayetteville, Arkansas

National Science Foundation
WHERE DISCOVERIES BEGIN

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Executive Summary

On May 21 through 23, 2019 in Fayetteville, Arkansas, the University of Arkansas hosted a workshop to identify issues and find solutions for university-industry engagement outside major metropolitan areas and megacities.

One hundred twenty-one university, industry, and government corporate engagement and economic development practitioners assembled to identify and find solutions for the shared difficulties that universities in non-metro areas face when collaborating with industry or government entities. Their conversations homed in on the shared difficulties that universities in non-metro areas face. At the same time, the conference provided a platform for participants to look ahead and think about leveraging their strengths and resources to create opportunities.

In preparation for the meeting, co-organizers Cynthia Sides, Julie Moody, Julie Preddy, Tony Boccanfuso, Linda Toro, Melissa Drake, and Abishai Kelkar organized the sessions to cover six main topic areas: leveraging and enhancing university research strengths, managing strategic partnerships, accelerating university research translation and commercialization, talent connections, placemaking, and advancing local economic development.

The issues and solutions that emerged from the presentations and discussions in these six areas are summarized below.

Leveraging and Enhancing University Research Strengths

Even when resources are scarce at universities in more rural areas, there are ways to maximize the university's impact on industry engagement. To do so, these universities must work as a team with people on their campuses.

Corporate-facing units can engage faculty who have an interest in corporate interactions and entrepreneurship. Universities can leverage faculty by building a culture that values industry relationships; creating platforms to nurture innovation; and selecting strategic partners with whom there can be a meaningful two-way exchange of value.

Research data can help universities in more rural areas to identify, grow, and enrich their strengths as corporate partners. Data-based decisions about investments into their research portfolio will enhance the possibility of future industry engagement. With world-class research programs, data will prove to industry that they offer quality partnership opportunities. Furthermore, universities must generate data-based information to broadcast their collaborative capabilities to be discoverable. They must also have data that corporate reps can use to convince their organizations that the university would be the right partner for the company.

Data can also illustrate the value of the university's social programs. The value might not be money in the pockets of the funder, but rather may be a fiscal proxy that expresses social value in economic terms. Universities engaged in large social impact programs can identify a fiscal

proxy for every value that they create and then generate a social return on investment. The universities can back up each of their calculations with data that validates the value calculation.

The federal government offers numerous programs for enhancing university research. The National Science Foundation offers the Established Program to Stimulate Competitive Research (EPSCoR). The EPSCoR program is available to states, commonwealths, and territories that receive ≤ 0.75% of NSF research support funding averaged over the most recent three years.

Every federal lab collaborates with universities and industry to transfer their technology. The Department of Energy Office of Technology Transitions reduces barriers to engagement with the national laboratories.

There are federal programs that support non-metro areas. The USDA has a rural development section, FDA has a whole division that is related to rural areas, the EDA has set-asides for a number of their grants.

Managing Strategic Partnerships

When a university covers a large geographic area, managing strategic partnerships can be difficult. The geographic spread of the institution can also create challenges for internal coordination. One model for structuring to maximize external engagement is UIDP's "Rings of Engagement." The UIDP publication, Comparing Internal Structures Guide, describes this model in detail. The model proposes a single relationship manager for industry and for the university. Each would serve as a single point of contact for their organization. Another model of engagement from UIDP is the University-Industry Partnership Continuum.

Strategic communication can enhance the management of strategic partnerships. Often, engagement professionals produce materials with no specific purpose in mind. However, when engagement professionals are more strategic, their materials have a higher impact. Strategic thinking also can eliminate the production of ineffective materials, which saves money. Fuentek LLC developed a system called AMMO (audience, message, mechanism, outcome) for communication initiatives. This system focuses on identifying the target audience, refining the core message to match the audience, selecting the best mechanism(s) for conveying them, and determining the outcome and metrics for evaluation.

Maximizing the outcomes of university-industry visits is vital for forming strategic partnerships. Companies visit universities in remote locations less than they visit those in metro areas. Thus, universities should consider the purpose and scope of the visit to allow fewer, more helpful visits. The university must also prepare for the visit to optimize time. Universities must plan for a full but flexible agenda, allow for language and cultural differences, and time the day so that the visitors will make their return flights. During follow up conversations, universities must align expectations for moving forward and acknowledge the ownership of actions. Overall, the university must learn the needs of the visitors, rather than focusing on what the university can offer. The UIDP publication, Maximizing the Outcomes from University-Industry Visits – Quick Guide, offers more advice for maximizing campus visits.

Accelerating University Research Translation & Commercialization

The most prominent challenge universities face regarding research translation and commercialization is motivating faculty to have an entrepreneurial mindset. Faculty think of themselves as researchers, not startup founders. Universities can encourage research translation and commercialization by establishing a culture that encourages entrepreneurship and university startups.

The National Science Foundation (NSF) and National Institutes of Health's I-Corps programs are helping to accelerate research translation and commercialization. The National Institutes of Health's IDeA program raises the success rates of obtaining SBIR/STTR awards in states that have received fewer SBIR/STTR awards than non-IDeA states.

Startups that have survived beyond SBIR/STTR funding may want to pursue venture capital. While there is more venture capital in metro areas, it does also exist in non-metro areas. The states with the highest increases in VC investments from 2017 to 2018 are Vermont, North Carolina, Ohio, Maryland, and Indiana. In 2018, venture funding reached startups in all 50 states and the District of Columbia.

Talent Connections

One of the leading motivators for industry to engage with universities is to gain access to the students. However, there is a gap between the skills students learn at universities and the skills they need to work in industry. The solutions for closing this skills gap differ for undergraduate students vs. graduate students. There are more existing mechanisms for addressing the skills gap on the undergraduate level than on the graduate level. These mechanisms include advisory boards, certificates, mentorships, capstone projects, and experiential learning. Graduate schools focus on training the next generation of academics more than on preparing students to work in industry. However, faculty who do corporate research are likely to pass along industry-relevant skills.

Universities must prepare students for automation, which will affect healthcare and other industries. With digital technology, in the new economy, most jobs will be non-routine. Universities need to rethink how they deliver education. For example, ask why an undergraduate education has to last four years, or how education can be more affordable and agile. Universities must move towards a holistic, human-centered strategy. All people are seeking meaning in their lives, so universities should design curriculums with this in mind.

Internship programs are popular ways for industry to connect with universities. When universities are creating internship programs with industry, they must get buy-in from their university's administration. For established programs, it is crucial to continuously collect data that supports the university's ongoing support of the program.

Universities with research parks can attract major corporations to a more rural location if they can offer access to students with the skills the companies need.

Placemaking

It is possible to replicate a university-anchored innovation community on a different scale in a community of any size. All thriving innovation communities need a conducive environment of investment in research and development by the private sector, the presence of high-quality academic institutions, extensive university-industry collaborations, and protection of intellectual property.

Financial institutions base decisions about financing innovation communities on the same criteria, whether they are in metro or more rural areas. The proposed physical place, the people and companies who will be part of the community, and the anticipated economic output are always under consideration. Financial institutions also look to anchor institutions to bring together the right blend of investment and collaboration by the public and private sectors. Having the right design for the proposed facility is also critical. People must come out of their offices to collaborate, and it takes a good design and excellent programming to make this happen. People must also be near to each other: even if a university has lots of land, it should create facilities that keep people in close contact with other community members. If all those these elements are in place, financing will not be challenging to get.

In any area, metro or non-metro, the anchor institution must spark—not merely invest in—the opportunity. It is never too early to look into financing for innovation communities. Do not assume that a "no" is the final answer. Seek advice from university presidents, chief financial officers, lawyers, and developers.

Research parks can play a significant role in creating vibrant innovation ecosystems. The university location can act as a catalyst to attract parts of the ecosystem to come together in one place. Research parks enable major corporations to be near universities and offer university spin-out companies a place to settle nearby. Research parks in more rural areas attract startup companies because they offer a low cost of living along with a high concentration of venture capital and innovative thinkers.

Advancing Local Economic Development

Universities outside of major metropolitan areas have the potential for promoting economic development due to their scope and scale of resources, which are often abundant in comparison to other relevant public and private entities in their region. Universities in this context often surpass other organizations in spending power, talent generation, technical expertise, and creation of knowledge-based companies.

Many universities are not aware of local government or economic development groups that could help them to increase their local impact. They may be missing out on opportunities, such as using empty industrial space for colocation space or startups. At the state level, they may be missing out on procuring monies through third party tax credits.

Making proactive plans with local governments can help universities to learn about more of these opportunities. Also, as universities develop plans to collaborate with local government,

they expand their idea of what might be possible. Collaborating with a local government can help a university to win even larger grants because they can show that they can form partnerships. This strategy is not a quick fix. Universities must build relationships over a long time before they can collaborate on more extensive partnerships.

1. WORKSHOP PARTICIPANTS

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2. WORKSHOP ORGANIZATION

The workshop agenda included sixteen plenary sessions, ten breakout sessions, and pre- and post-workshops.

The pre-workshop, "Using Research Data to Enhance Collaboration" allowed attendees to participate in an in-depth workshop on how strategic data sets contained in robust research information management systems can help university leadership administer a university research enterprise.

All sessions focused on the shared difficulty that universities face in non-metro areas. Each session put forth practical ways for people in university-research engagement to be more successful. In all sessions, speakers presented case studies that were relevant to universities in more rural areas. The breakout sessions investigated some of the primary issues of non-metro universities in greater depth and allowed time for participants to share experiences from their institutions.

During the post-workshop, attendees outlined all of the information covered at the meeting and began drafting a toolkit to be used by attendees and other interested parties.

A full agenda of the workshop is below.

WORKSHOP PROGRAM

DIRECT ACCESS TO WORKSHOP PRESENTATIONS

Tuesday, May 21

UIDP Academy Workshop: Using Research Data to Enhance Collaborations

- Economic Development and Innovation in Smaller Metros and Regions: A Global View (Daniel Calto, Elsevier, Inc.)
- Using Research Data to Enhance Collaborations

U-I Engagement Outside Major Metropolitan Areas Workshop

- The Role of Industry and Universities in Advancing Collaborations Outside Major Metro Areas – John Deere and Iowa State
- Bringing Venture Capital to Areas Beyond Major Metropolitan Areas

Wednesday, May 22

U-I Engagement Outside Major Metropolitan Areas Workshop

- Maximizing the Outcomes of U-I Visits (Jackie Serviss, University of Waterloo)
- Catalyzing University-Industry Collaborations Through Strategic Facility Construction, Design, and Financing (Kevin Byrne, TUFF)
- Students as Conduits Between University and Industry (Carey Olson, J.B. Hunt)

- Engaging Researchers On and Off Campus to Nurture Sustainable Corporate Partnerships (Peter Dorhout, Kansas State University and Joseph Hepper, Texas Tech University)
- Structuring to Maximize External Engagement (Jeff Fortin, Penn State University)
- Clinical Trials (Patrick Christiansen, Inova and Amy Jo Jenkins, University of Arkansas for Medical Sciences)
- Maximizing Impact in the Face of Resource Scarcity (Terri Goss Kinzy, Western Michigan University
  Jim Baker, Michigan Tech University)
- Toolkit Contents (Liz Schenk, UIDP and Mitch Horowitz, Teconomy)
- The Rise of the Rest: Creating Vibrant Innovation Ecosystems Outside of Major Metropolitan Areas through University Research Parks (Brian Darmody, AURP)
- The Rise of the Rest: Creating Vibrant Innovation Ecosystems Outside of Major Metropolitan Areas through University Research Parks (Laura Frerichs, University of Illinois)
- Role of Local Government and Regional Economic Development Groups in Advancing University-Industry Collaborations (Christine Thiesing, SCRA, Ryan Anderson, University of Nebraska, Dan Hoffman, Invest Nebraska Corporation, and Bob Wilhelm, University of Nebraska)

Thursday, May 23

U-I Engagement Outside Major Metropolitan Areas Workshop

- Entrepreneurship and University Start-Ups (Louise Epstein, Walton Family Foundation)
- The Strategic Role of the Federal Government in Supporting the University Innovation Ecosystem (Krishan Arora, National Institute of Health)
- The Strategic Role of the Federal Government in Supporting the University Innovation Ecosystem (Chinonye Whitley, National Science Foundation)
- The Strategic Role of the Federal Government in Supporting the University Innovation Ecosystem (Clara Asmail, Department of Energy)

3.1 STUDENTS AS CONDUITS BETWEEN UNIVERSITY AND INDUSTRY

Contributors: *Carey Olsen, Eric Airola*

3.1.1 Significance, Obstacles, and Opportunities

One of the leading motivators for industry engaging with universities is to gain access to the student talent pool. A partnership between J.B. Hunt Transport Services, Inc. and the University of Arkansas (UA), illustrates some obstacles and opportunities to these partnerships in non-metro areas. J.B. Hunt., one of the largest supply chain solutions providers in North America, has a robust internship program with about 130 interns at any given time. The majority of those are in J.B. Hunt's corporate headquarters in Fayetteville, Arkansas. The company wanted to tap into the student workforce at UA to fill some gaps in its entry-level workforce but needed to move closer to campus to achieve its goal.

- It is challenging to hire and retain talent in low-wage, entry-level positions. Such positions may be routine but still require precision and customer service skills. Employees often leave within three to six months.

- Companies that are not close to university campuses may have difficulty hiring or offering internships to university students. These workers may not be willing to spend time commuting and potentially jeopardizing their academic time commitments. The campuses of companies in more rural areas may also be more spread out, which increases the time it takes a worker to commute from campus to a corporate job.

- It is difficult for some companies to provide a work location for students that is closer to campus due to the cost and insufficient appreciation of the benefits of doing so for the company.

J.B. Hunt's well-established internship program helped to set the stage for them to pursue greater opportunities to hire students from UA. Upper management had already seen the benefits of their existing internship program, and so were open to considering innovative ways to connect with students. Full support of the company CEO and the dean of the Collage of Business at UA allowed the company to move forward with its plans to open a facility on or near the university campus.

The company scouted the area and identified a few top choices of location, both on and off campus. They ultimately selected a site located on the UA campus, and the university worked with them to negotiate a competitive lease. The facility has been named "J.B. Hunt On The Hill."

Having decided to create a facility on campus for interns and part-time workers, J.B. Hunt became a sponsor in the university's Corporate Partnership Program. This relationship allowed them to work with a single UA liaison who served as a point of contact for campuswide engagement. They also had the opportunity to produce branded marketing materials through career services and to host a branded career fair on campus to announce the available jobs and

internships in the center.

J.B. Hunt On The Hill opens up opportunities for J.B. Hunt to offer students a meaningful internship experience, in addition to part-time jobs. Students gain real-world experience in business, engineering, supply chain management, marketing, and more. While the company primarily recruits students that are in the College of Business, the College Industrial Engineering, or computer science, the facility offers opportunities for students in all majors. The students can request academic credit for their work experience, but they are not required to do so.

J.B. Hunt On The Hill allows students to learn the soft skills they will need in future corporate workplaces. There is a full-time on-site operations manager who oversees J.B. Hunt on the Hill who trains the students in everything from how to dress properly in an office environment to cleaning up after themselves in the office kitchen. She also works with students to cultivate an attitude that will help them to advance in a corporate environment. There is also an emphasis on having a fun workplace so that students will want to engage.

J.B. Hunt On The Hill also exposes students to the specifics of J.B. Hunt's corporate culture, which would ease a transition to the workplace if they decide to work there upon graduation. The facility itself is designed to look like the J.B. Hunt corporate environment. The desks mimic the ones in the corporate office; the carpet has a similar design, and the color of the walls and artwork is the same as in corporate headquarters. The open-plan office encourages students to interact. Also, the facility offers spaces created to meet specific needs of students: there is space for students to do homework or to eat lunch, a training room where they can take online classes, and spaces for students to collaborate on group class projects. The facility currently holds 68 people but could hold as many as 90 people.

3.1.2 Recommendations

- When considering innovative programs to engage industry with students, obtain the buy-in from the company's upper management and the university's administration.

- After the first year of a student internship program, begin collecting data from continuing students. Find out what type of work interns are doing, what has compelled them to continue to work through the internship program, how connected they feel with the sponsoring company, and whether they think they would opt to work for the sponsoring company. Also, collect data on occupancy rate and rate of conversion of students to full-time employees.

- Use analytical data to report back to the executive leadership team. Include data on the cost of opening the office and the short- and long-term returns on the investment. Also report on intangible benefits, such as the enrichment of the relationship with the university and with the students.

3.2 PROMOTION OF LOCAL ECONOMIC DEVELOPMENT

Contributors: Joe Shields and John Glazer

3.2.1 Significance, Obstacles, and Opportunities

Universities outside of major metropolitan areas have the distinctive potential for enabling economic development due to their scope and scale of resources, which are often abundant compared to other relevant public and private entities in their region. Universities in this context have more spending power, talent generation, technical expertise, and ability to create knowledge-based companies.

Obstacles to the promotion of local economic development include:

- Some universities are bureaucratically complex and inconsistent in maintaining external relationships.
- It can be challenging for corporate engagement offices to collaborate with alumni offices that perceive their mission as not being related to the corporate engagement mission.
- It can be challenging for universities to overcome perceptions that the university is out of touch with the needs of the local community.
- It can be challenging for universities to overcome the myth that only metropolitan-area universities do proper research.

Working to overcome a perceived town/gown divide presents many opportunities for universities in non-metro areas. The community may perceive a high barrier between the university and the community. But this may be a misconception. The university should strive to put the community at ease by developing trust. The universities can build trust by projecting a service leadership style as opposed to a "come and follow me" leadership style. Universities should resist telling the community the solution to the problems are, but rather should convene conversations in which those solutions can emerge. In these conversations, universities should spend most of their time listening. Moreover, they should allow the community to own the successes.

When they overcome the perceived divide between town and gown, universities will be in a position to promote economic development through partnerships. These partnerships can be between the university and elected government officials, public and nonprofit agencies, local businesses, and development-focused bodies such as port authorities and industrial parks. If a forum does not exist to bring representatives of such bodies together regularly, the university should create one. Involving company representatives on program advisory boards sends a strong message that the company is a valued partner.

When universities “own” their responsibilities for economic development, they are more apt to look for ways to leverage state and federal funding programs to support economic development. These funding sources often require or favor proposals with expressions of support and financial commitments demonstrating a breadth and depth of interest from regional partnering entities. In some cases, the statement that a project has university backing can be more significant than any financial contribution.

Universities that consider economic development as part of their mission are also more apt to boost collaborations via in-house capacity to serve as a fiscal agent, provide project management oversight, or contribute other critical expertise. These universities think about what kinds of skill sets and talents it has in its professional staff and make hiring decisions to fill any gaps.

3.2.2 Recommendations

- Be a leader. Create partnerships with government and community groups if they do not already exist.
- Be a facilitator rather than an implementor when dealing with the community. Do not dominate the conversation; make sure that partners have a voice.
- Share credit with partners. Advertise with joint announcements; do not let a press release go out without mentioning everyone who was involved. Be sure to mention everyone involved in the conversation or negotiation. Do not forget anyone.
- Leverage teaming opportunities. The university's assets and local economic development could work together to respond to a hard situation and leverage each other's strengths.
- Build economic development skillsets within the university.
- Leverage relationships with alumni.

3.3 ENGAGING RESEARCHERS ON AND OFF CAMPUS TO NURTURE SUSTAINABLE CORPORATE PARTNERSHIPS

Contributors: *Peter Dorhout, Joseph Heppert*

3.3.1 Significance, Obstacles, and Opportunities

The promotion of sustainable faculty-industry partnerships at land grant and public universities is critical. For institutions in more rural areas, doing so requires them to dispel commonly-held myths about institutions in non-metro areas. These myths include the belief that faculty at these institutions are not as interested in collaborating with industry as are their counterparts at institutions in metro areas. Another myth is that faculty at institutions in more rural areas do not have enough expertise to offer much value to industry partners.

Dispelling these myths about sustainable faculty-industry partnerships at non-metro institutions will require these institutions to integrate groups across campus; create a campus culture that encourages faculty to value the industry relationship; create both human and digital information systems that enable institutions to present opportunities from across the entire institution; build platforms to nurture faculty and student innovation; and define and select the strategic partners with whom there can be a meaningful two-way exchange of value. In seeking to achieve these goals, institutions may encounter the following obstacles:

- It can be challenging to integrate an innovation ecosystem at institutions where silos are entrenched. There are few, if any, institutions that have integrated all of their corporate engagement staff across the campus.

- It can be challenging to convince various units within the university to share the credit for initiating a relationship with a new industry partner. There may be a perception that there is a limited amount of money to be gotten through industry partnerships and that if one unit is successful in garnering funds from industry, they are taking money that would otherwise have gone to a different unit.

- Some institutions lack processes and procedures that support faculty engagements with industry.

- Some institutions lack the kinds of contracting relationships, relationships of corporate philanthropy, and startup and spin-off policies that allow faculty to take full advantage of collaborations with industry.

- It can be challenging to introduce the idea of the overall innovation process to faculty and students.

- Some institutions do not have funds for innovation initiatives.

- It can be challenging to define the criteria for the most desirable strategic partners.

One of the most significant opportunities for overcoming the obstacles outlined above is integrating groups across campus. There are many intentional strategies currently in use for actualizing this opportunity. For example, Texas Tech University created a platform consisting of entrepreneurial development, research commercialization, and a Small Business Development (SBDC) office. Portfolio managers (a.k.a. concierge managers) oversee that lower level. The portfolio managers are mostly individuals who come out of the innovation space. Their goal is to work with different groups on campus to get to the higher mutual value from each corporate engagement. Another example of integrating groups is from Kansas State University (KSU), which created a Strategic Partner Planning Group that includes leadership from research, tech transfer, economic development, and research development offices.

Another strategy is to use the concierge model, in which concierge managers, who are aware of all activities at the colleges, departments, and corporate engagement-related offices, are the first point of contact for industry. Using this model, a university can progress from engaging with a corporation in one or two places to engaging across multiple value-added relationships in both education and research programs. Another strategy is to create a close relationship among the individuals in charge of separate university units responsible for different types of relationships with industry. These could include the heads of development, technology transfer, or alumni development. Both models are most effective when all parties equally share the credit for all resulting relationships with industry.

Creating a campus culture that rewards faculty for engaging with industry presents another opportunity for non-metro universities. University policies about promotion and tenure processes must value faculty-industry relationships. Universities can also encourage these relationships by allowing mutually favorable contracting relationships, corporate philanthropy relationships, and entrepreneurship-friendly start-up and spin-off policies.

Nurturing faculty and student innovation also present opportunities for non-metro universities. One example of this is the Texas Tech Innovation Hub, which emulates the I-Corps model for commercialization and innovation. At the early innovation stages, the Innovation Hub works with student groups and faculty who are bringing new ideas to the table. The Innovation Hub educates them about the overall innovation processes, market value, customer discovery, and commercialization.

Funding for Innovation Hub startups comes from SBIR/STTR grants and regional, angel, and federal funding. With these resources, the Innovation Hub has increased the number of people entering this early-stage ideation process. About 30 percent of the groups are the community. Also, the Department of Commerce has awarded the Innovation Hub a grant to develop a new seed fund. Moreover, to avoid the limitations of a public university entering into contracts with corporations, the Innovation Hub has created a 501C3 entity for contracting purposes.

Non-metro universities that clearly define and identify the qualities of their ideal strategic partners are best able to benefit from faculty-industry partnerships. There is a broad spectrum of types of strategic partners. Many strategic partnerships start as transactional relationships, where an individual within a company has a one-on-one relationship with a single faculty member.

These are the relationships that can eventually grow into a strategic relationship, with multiple touch-points between the university and the company. The local community can also be an excellent strategic partner.

3.3.2 Recommendations

- Eliminate silos on campus so that the university can provide more than one point of contact for each strategic partner. Possible strategies include establishing a strategic partner planning group on campus that includes leadership from a variety of different units and using a concierge model to give industry a contact that can coordinate their needs across an entire campus.

- Create policies that value faculty-industry relationships. These include policies about promotion and tenure processes, contracting relationships, corporate philanthropy relationships, and start-up and spin-off policies. Seek to fund this through SBIR/STTR, regional, angel, and federal funding sources. Consider creating a 501C3 entity for contracting purposes.

- Nurture faculty and student innovation. Educate students about the innovation process, market value, customer discovery, and commercialization.

- Take time to understand and define the types of strategic partners that are right for each institution.

3.4 STRUCTURING TO MAXIMIZE EXTERNAL ENGAGEMENT

Contributor: Jeff Fortin

3.4.1 Significance, Obstacles, and Opportunities

When a university is spread out across a large geographic area with multiple campuses, it can be difficult for industry to navigate opportunities for collaboration with the institution. The geographic spread of the institution can also create challenges internally, as coordination among geographically distant corporate engagement units can be challenging.

Penn State University is an example of a non-metro institution that is overcoming the obstacles and developing opportunities to overcome these challenges.

- It is challenging to coordinate corporate engagement across multiple campuses. Penn State, for example, has 23 campuses. Corporate engagement staff may not know whom to talk to about engaging with companies. General breakdowns in communication can make it difficult to have optimal engagements with industry.

- It is challenging to align a strategy for corporate engagement to a university strategic plan.

When universities begin to consider changes to maximize external engagement, they can step back and reconsider their existing preconceptions about engaging with industry that are embedded in their existing structure. For example, after researching the reasons that companies engaged in philanthropy with the university, Penn State learned that industry's main reason for philanthropic giving to the university is to build the company's brand, support the company's initiatives, and to build a pipeline of talent for the company. The other reason for giving is to support research by investing in a new research lab, a facility, a grant to the faculty. However, Penn State concluded that companies are more interested in students than in supporting research. Now, Penn State engages with industry for research and talent acquisition, with strategic philanthropy as a tool to advance both.

Since talent acquisition is such an essential aspect of industry engagement, Penn State places a high emphasis on the structure of career services. Their director of career services created a solid collaborative relationship with all of the colleges and staff from across campus meet monthly. To make collaboration more manageable, the university has created one recruiting tool, where in the past each college had its own. Now, students and alumni across campus can view jobs that companies have posted.

Universities that want to create a collaborative environment may already have some structures in place that can help move them in that direction. At Penn State, there is an Industry Partnership Working group that focuses on research partnerships. Another group called the Corporate Relations Committee is made up of top-level university executives who meet quarterly to discuss industry engagement, best practices, and current activities. There is also a Corporate-Foundation Relations Advisory Board that is made up of alumni in industry.

The UIDP publication, *Comparing Internal Structures Guide, outlines a model*, "Rings of Engagement," that maximizes external engagement. The model suggests that one relationship manager each from industry and the university serve as the single point of contact at each organization. This model is the one towards which that Penn State is working.

Another model of engagement from UIDP is the University-Industry Partnership Continuum, which Penn State is also working to emulate. The goal at Penn State is to build more strategic relationships that include research and innovation; licensing technologies, entrepreneurship and startups, talent recruitment, strategic philanthropy, and executive, online, and continuing education programs. Penn State has classified the companies with which they engage as ones they need to develop, grow, and sustain and is aligning their team organizationally to increase their engagement in different areas of the partnership continuum.

3.4.2 Recommendations

- Align a cohesive university-wide strategy with the university's strategic plan.
- Prioritize holistic engagement to maximize revenue, creating win-win scenarios for all corporate development units across the university.
- Integrate offices of corporate engagement offices, including research, development, and career services to lead corporate engagement for the university. Form one team that becomes the front door for the university.
- Designate a staff member to develop and execute strategy, goals and metrics, staffing plan, communications strategy, and big ideas.
- Collaborate with key stakeholders across the university.
- Think about not only what the engagement team is doing, but also about how to provide tools, processes, expertise, to all of the university so that they can manage their relationships.
- Five essential elements of corporate relations programs are 1) institutional support, 2) mutual benefits, 3) one-stop shopping, 4) integrated research development 5) Campus coordination
- Universities who want to move in this direction need to study and compare the models that are in place at comparable universities.

3.5 CLINICAL TRIALS

Contributor: Amy Jo Jenkins

3.5.1 Significance, Obstacles, and Opportunities

Clinical trials at the University of Arkansas for Medical Sciences have recently tripled. Their determination to challenge misconceptions about non-metro academic medical centers and to convince companies that their more rural location does not impede their desirability as a location for clinical trials has led to their success.

There are common obstacles that non-metro academic medical centers need to overcome:

- Some companies are concerned that non-metro centers present transportation challenges, such as no direct flights, limited flight availability, a far distance from an airport to the site, and lack of public transportation.

- Some companies are concerned that there will be insufficient patient volume, low patient access to medical center facilities, and too much distance between patients' homes and the medical center trial site.

- Some companies are concerned about too much university red tape. They worry that the IRB review and approval will take too long, that they will be required to use a local IRB, that contract review and execution will take too long, and that the contract terms will be too strict.

- Some companies do not realize that there are key opinion leaders at more rural universities.

- Some companies are concerned that non-metro medical academic centers lack adequate clinical trial infrastructure and that the center's staff may lack sufficient experience.

None of these obstacles are insurmountable. Regarding transportation, many academic medical centers can offer local airports with easy access airports, fewer delays, and minimal traffic. While it is true that many airports in rural areas do not offer taxis or rail service, most do have Uber or Lyft available. If no other transportation is available, the academic medical center is likely to provide transportation for visitors.

There are some advantages regarding access to patients for companies using non-metro academic medical centers. Academic medical centers located in metropolitan areas may appear to have more significant numbers of patients using the facility, but these numbers may be deceiving. Many of the patients included in the total count for metropolitan academic medical centers may not have even been seen within the past year because they selected a different facility for subsequent visits. Since academic medical centers in rural areas are often the only facility in the region, it is more likely that these patients come to the center for all of their medical needs. Furthermore, companies may be overestimating the importance of the distance patients must

travel to the center. It is not unusual for patients in more rural areas to travel further for medical care than are their counterparts in metropolitan areas.

Most academic medical centers do have key opinion leaders in the area for which the center is known. The academic medical centers in more rural areas need to let companies know which areas of expertise are especially strong at their institution. Researchers should talk about what they have published in their area of interest.

Academic medical centers in more rural areas also can overcome doubts about their infrastructure for clinical trials by describing how they handle clinical trials. The more they tell the company about specific people and their specific roles, the more likely it is that the company will trust that the medical center has an infrastructure in place. Introducing staff that handles the center's clinical trials will also help to gain the company's trust. Impressive staff credentials can also help to gain trust. Professional certifications from such professional associations as the Society of Clinical Research Associates (SOCRA), the Association of Clinical Research Professionals (ACRP), or the Regulatory Affairs Professionals Society (RAPS) signal the professionalism of the staff. However, having both experienced investigators and experienced staff is not as significant an obstacle as some centers fear. If a center has either, one can train the other.

3.5.2 Recommendations

- Look for opportunities to engage with industry. Companies will not be searching for trial sites in non-metropolitan areas.

- Please high priority on communicating with companies. Timely responses will help a medical center stand out from those in metropolitan areas.

- Always follow up with any company that expresses interest in a trial.

- Assign responsibility for communicating with companies as part of a specific person's job.

- Take advantage of the strengths and unique characteristics of the medical center. These advantages include having access to special populations, such as rural, minority groups, or underrepresented communities.

- Stress the ability of the medical center's staff to work together between departments.

- Build relationships in the community that will ease the recruitment of patients for trials.

3.6 START YOUR AMMO

Contributor: Laura Schoppe

3.6.1 Significance, Obstacles, and Opportunities

University-industry engagement professionals communicate with their internal and external stakeholders in many different ways. They may produce a newsletter, annual report, proposal, or other communication pieces. Often, engagement professionals produce these materials without putting much thought into what specific purpose the materials will serve. However, if engagement professionals were more strategic about the materials they create, they could improve the results of their communications. They could also reduce the cost of producing the materials.

Fuentek LLC has developed a system called AMMO (audience, message, mechanism, outcome) for communication initiatives. This system focuses on identifying the target audience, refining the core message to match the audience, selecting the best tool(s)-- or mechanism(s)--for conveying them, and determining the call to action—or outcome—and metrics for assessing success.

AMMO addresses many of the obstacles that engagement professionals encounter when communicating with their stakeholders.

- It can be difficult to tailor a message to specific internal stakeholders, such as university researchers and innovators; university presidents; deans; and other administrators.

- It can be difficult to tailor a message to specific external stakeholders, such as legislators, venture capitalists, industry partners, or local businesses.

- It can be challenging to discover the best mechanism for communicating with different audiences. Some audiences are online. Others get the message at conferences or in trade publications.

- The purpose of a communication piece may be unclear to the communicator.

AMMO offers a system for effective communication. Using AMMO, the communicator begins by understanding the audience. There can be internal audiences, such as university researchers and innovators; university presidents; deans; and other administrators. External audiences might include legislators, venture capitalists, industry partners, or local businesses.

The communicator's second step is to create the message. The communicator focuses on whether the message receiver will hear something in the message that fills their wants, needs, or desires. If the communicator is crafting a message for research faculty to become engaged in industry research, they might point out that this research may lay the foundation for more significant grants from federal agencies in the future. A message directed towards legislators might

highlight the value that university research is bringing back to the legislators' legislative district. Taxpayers may see the value of funding public research institutions if they hear about the positive impacts the university delivers to their community. The head of a technology transfer office may agree to hire more staff if they know the move could save hundreds of thousands of dollars. Even if the communicator is talking about the same topic to different audiences, the message would be different for each audience.

The third step of AMMO is to decide on a mechanism for delivering the message. The communicator considers the location of the audience when they would hear or see the message. Their location may be obvious, such as when the communicator is delivering the message as a paper at a conference. In this case, the mechanism would likely be a PowerPoint presentation. The length of the presentation would depend on the audience. For example, if the presentation is for venture capitalists, the presentation should be concise. If the presentation is describing research, it would be much longer. Alternatiely, if the communicator has a message for designers in the textile industry, they would bypass LinkedIn and attend an industry trade show, because designers in that industry do not use LinkedIn but do attend trade shows.

The final step of AMMO is to identify how the message will change the audience. The communicator considers what they want the audience to do or what they need from that audience. The communicator always has the end in mind.

3.6.2 Recommendations

- When making a presentation, communicators should know who will be in the room and craft the message for that audience.

- When developing a message, communicators should consider how and where you are going to deliver the message to their audience.

- When communicators are developing a message, they should keep asking: Who cares? Why? So what?

- Communicators will often have to use several mechanisms for delivering a single message to a single audience. They also may have to repeat the same message through the same mechanism several times.

- Communicators can modify communication pieces for different audiences. This strategy can be very cost-effective.

- Communicators should consider the outcome that they want to happen after they have delivered the message.

3.7 INDUSTRY-SPONSORED EXTERNAL TRAINING FOR STUDENTS

Contributors: Alex Primis, Andrew Crain

3.7.1 Significance, Obstacles, and Opportunities

A university's job is to give a student the best education possible. However, a good education does not necessarily improve a student's chances of finding a good job when they graduate. Only in the past five to ten years have universities turned their attention toward metrics and begun tracking the job prospects of their graduates. Today, university communities and stakeholders are demanding that educational institutions provide students with marketable skills.

In order to produce students with marketable skills, universities need to know which skills are in demand by industry. However, there are no established best practices for universities to identify these gaps and to change curricula to eliminate the gaps.

An additional concern is that students entering the university today at the age of 18 are going to have multiple careers throughout their lifetimes. Universities need to change their orientation towards teaching first-time students to teaching continuous education for adults.

Universities face some obstacles to delivering education that promotes marketable skills:

- PhDs and postdocs focus on one area of research. They do not study skills that would raise their appeal to industry hiring managers. If the curriculum is available to PhD students, many faculty will not allow students to take time away from academic studies to learn industry skills.

- Faculty lack industry experience and cannot incorporate industry skills into the curriculum.

- Graduate schools are not as interested as undergraduate schools in training students in skills that would be useful in industry: they are more interested in training the next generation of academics.

- It can be challenging to attract graduate students to professional development events. Graduate schools are often decentralized, and none can require that their students attend.

- There is a reluctance at more traditional colleges to deviate from the standard 3-year-long curriculum development process.

Students are often involved in the first steps of university-industry engagement. However, there is a gap between the skills students learn at universities and the skills they need to work in industry.

The solutions to the skills gap differ for undergraduate students vs. graduate students. There are existing mechanisms for addressing the skills gap on the undergraduate level. These mechanisms

include advisory boards, certificates, mentorships, capstone projects, and experiential learning.

Graduate schools focus on training the next generation of academics more than on preparing students to work in industry. However, faculty who do corporate research are likely to pass along industry-relevant skills.

Some universities are initiating strategic programs to fill the skills gap. For example, University of Georgia Graduate School has an initiative for experiential professional development. Programs include career symposiums, company site visits, industry days, and job simulations.

Universities are now considering the potential value of credentials in industry skills areas. Industry offers some examples of micro-credentialing. Undergraduates especially appreciate having credentials to add to their resumes.

Universities could also offer platforms such as Coursera for training university students. Coursera covers many industry-related topics in formal core sequences every semester. Also, many professional associations provide significant training.

There could also be opportunities to build partnerships with university vendors. For example, an arrangement between Dartmouth University and a vendor included training along with the purchase of lab equipment. Training for PhD and professional development students was part of the service contract.

3.7.2 Recommendations

- Expand the use of Industry Advisory Boards to academic areas that do not typically engage with industry.
- Create training partnerships with existing industry research partners.
- Encourage faculty to expose their students to industry work culture.
- Increase the number of undergraduates who do industry-related capstone studies.
- Universities can begin by customizing the curriculum around an industry. However, it has to be a major industry, or there is no return on that investment.
- Invite alumni that work in industry to come back and speak to students. Offer fellowships so that the industry representatives can stay on campus for a few months.
- Student groups, rather than administration, should sponsor professional development activities. The speakers for their events should be from industry, rather than from the faculty.
- Offer credentialing programs within a formal class setting. It is easier for graduate students to get a release from faculty if the class is formal. Formality encourages students to attend.

- Form a UIDP committee of people from campuses that are receptive to incorporating industry skills into the curriculum. Create a forum for a conversation between university and industry partners about how to reshape curriculum development to end the skills gap. Produce a UIDP resource guide of best-practice strategies to enhance industry involvement.

3.8 DRIVING ALIGNMENT BETWEEN UNIVERSITY PROJECTS AND CORPORATE PRIORITIES OUTSIDE OF THE CORPORATION GEOGRAPHIC FOOTPRINT

Contributors: Matthew Roberts and John Glazer

3.8.1 Significance, Obstacles, and Opportunities

The business world accepts accounting principles as valid measures of success. These measures include such things as the enterprise value of a company or the value of a stock. Businesses base these value assessments upon dialogue and discourse, method calculations, and relevant facts. However, there are no comparable principles for measuring and communicating value in the social sector.

The Social Return on Investment Methodology shows promise as a data-driven way to show the value of social programs. The methodology is particularly useful for universities in rural areas because it transcends geography. These universities can demonstrate the more significant value of a program based on data that is valid beyond their local area. With this geographically unbound data, universities can make a case for funding from sources outside of their geographic footprint.

The Social Return on Investment Methodology is becoming an essential part of grant-seeking proposals. The National Science Foundation RFPs have required impact data for some time and are now emphasizing this more than it has in the past. Also, grant-seekers are experimenting with pay-for-success financing models. These models enable the funder to pay only when the grantee achieves measurable outcomes. The Social Return on Investment Methodology offers a way for organizations to set the required achievable goals.

Obstacles for universities that want to measure the social value of their programs include:

- It is difficult for universities to quantify the impact value of the social programs for which they seek funding.
- Many existing methodologies are insufficient because they rely on counting outputs without addressing impact or value.
- There is a perception that society cannot use data to measure social value.
- There is a perception that universities in more rural settings cannot generate enough data to demonstrate impact.

Universities can use the Social Return on Investment Methodology to attract funding. A venture capital firm invented the methodology to justify their investments in social enterprises. A social enterprise is market-driven and revenue-generating, with the intent to be financially sustainable. At the same time, it is pursuing social or environmental goals, which are as important to the enterprise as its financial goal. The VC firm based the methodology on the metric system for measuring value.

The Social Return on Investment Methodology allows universities to summarize the value of the program in a single return ratio: for every dollar invested, there are x dollars of value created. The return ratio can demonstrate a constant future return on investment.

Grant-seekers can use this methodology to show potential investors the data and its source. Then, grant-seekers can use this information to reach a consensus with the funder about measurable goals. In the end, the value may not be precisely calculated, but it is a data-based expression of the value that the program created.

The core of the Social Return on Investment Methodology is that, if a social program creates value in the world, there must be a way of seeing what that value is. The value might not be money in the pockets of the investor, but rather may be a fiscal proxy that expresses social value in economic terms. Universities engaged in large social impact programs can identify a fiscal proxy for every single one of the values that they create and then came up with a comprehensive social return on investment.

3.8.2 Recommendations

- Use the Social Return on Investment Methodology to attract funding. Use this methodology to show potential investors the data and its source. Then, grant-seekers can use this information to reach a consensus with the funder about measurable goals.
- Back up each calculation with a study that validates the value calculation.
- Build a database of fiscal proxies for use in the Social Return on Investment Methodology.

3.9 MAXIMIZING IMPACT IN THE FACE OF RESOURCE SCARCITY

Contributors: Jim Baker and Terri Goss Kinzy

3.9.1 Significance, Obstacles, and Opportunities

Resource scarcity, by its nature, inhibits progress across the domain of industry engagement. It hinders community economic development, sponsored research, corporate philanthropy, and more.

Universities outside of metropolitan areas particularly experience resource scarcity. These universities are in remote areas without large businesses in the community. There are several obstacles that many of these universities face:

- It can be challenging for universities in non-metropolitan areas to identify the best use of limited funds.

- Universities in non-metropolitan areas may not receive state-funded support for industry engagement. Some states have shut down most, if not all, of their industry engagement programs.

- It can be challenging to identify all the corporate-facing people in the university. Campus networks for industry engagement may not include all people that interact with industry.

There are many opportunities for corporate engagement professionals at non-metropolitan universities to maximize their impact on corporate engagement. These professionals can leverage people throughout their institutions who have contacts with corporations. By building strong internal networks, the university can present a comprehensive package of resources to external partners. Corporate engagement professionals must build an internal collaborative network when there are no funds to establish a dedicated corporate engagement office.

Universities in non-metropolitan areas can also leverage low-cost or free resources. Social media and websites allow these universities get far-reaching exposure. Often, corporate engagement professionals can leverage local groups to disseminate messages. These groups include chambers of commerce or regional economic communities, which have similar goals for industry outreach.

Universities can also leverage external funds from philanthropy or the state. University student or economic development programs appeal to philanthropic organizations. A university's ability to show statewide impact can attract state funding.

3.9.2 Recommendations

- Leverage scarce resources by bringing together people across the university. Work as a team. Develop trust and relationships among players within the university. Engage

faculty that have an interest in corporate interactions and entrepreneurship. This engagement gives these faculty a place to belong and demonstrates that the university values their skills.

- Develop a campus-wide organizing unit to direct companies across the university. Have this unit develop its own funding after a few years via corporate partnerships or sponsorships.

- Get the message out through social media and community partners. Ask the marketing and communications unit if they have materials that promote corporate engagement interests. Ask the chamber of commerce to provide a conduit to local business, share information, or help survey chamber members about their needs.

- Develop and leverage other funding, such as philanthropy and state funding. Do not assume that state funding is not a possibility.

- Use the "give and get" model to bring internal and external people together to share what they can offer and what they need to ease the matching.

- Attend professional meetings and use that opportunity to engage with possible corporate sponsors.

- Web sites may not work as standalone external communication tools. The university must market these to external audiences. The websites may be useful for communication among corporate-facing parts of the university.

- Find ways to advocate to get more state support for economic development activities.

3.10 TOOLKIT CONTENTS

Contributors: Mitch Horowitz, Liz Schenk

3.10.1 Significance, Obstacles, and Opportunities

The conference organizers plan to create a toolkit for non-attendees that will address the issues discussed during the meeting. At a special session, toolbox creators reviewed the issues raised at the conference and developed a plan for creating the toolbox. The toolbox would illustrate the best practices for overcoming constraints to university-industry engagement in more rural areas.

The toolkit would help the universities to overcome these obstacles:

- It is difficult for universities in more rural areas to align themselves with regional economic drivers. Industry in these areas is often manufacturing- and logistics-oriented. They are not as likely to be doing the R&D that industry is doing in more metro areas. So, state and local governments see workforce development as needed in manufacturing skills, rather than as needed in knowledge-based jobs.

- Regional innovation ecosystems may lack resources and capacities. Some rural areas have broadband limitations.

- Key industry collaborators may be distant from universities in more rural areas. Non-metro schools suffer from a lack of visibility to industry. It can be difficult to convince potential partners to visit campuses in more rural areas.

- It can be challenging for universities in more rural areas to keep talent.

- The faculty at more rural universities may not embrace the idea of collaborating with industry. The university may not incentivize faculty to engage in university-industry collaborations.

The toolkit will present opportunities for addressing obstacles to university-industry collaboration. The six key tools for pursuing these opportunities are 1) leveraging and enhancing university research strengths, 2) managing strategic partnerships, 3) accelerating university research translation and commercialization, 4) talent connections, 5) placemaking and 6) advancing local economic development.

The key tool, “Leveraging & Enhancing University Research Strengths,” will instruct users on how to use research data to enhance collaborations, how to engage researchers on and off campus to nurture sustainable corporate partnerships, how to drive alignment between university projects and corporate priorities, and how to maximize impact in the face of resource scarcity.

The key tool, “Managing Strategic Partnerships,” will instruct users on the role of large firms in advancing collaborations. It will emphasize that large firms can provide access to market knowledge that can benefit an entrepreneurial faculty member or startup. The tool will also

instruct users on how to maximize the outcomes of university-industry, on the role of government labs, on how to structure to optimize external engagement, how to lobby for state and federal government resources, how to leverage relationships with corporate philanthropy, how to communicate with potential shareholders, and how to build support within organizations by focusing on shared successes and outcomes.

The key tool, "Accelerating University Research Translation & Commercialization," will instruct users on entrepreneurship and university startups and how to bring venture capital to their area.

The key tool, "Talent Connections" will instruct users on how students can be conduits between the university and industry. It will also instruct users on automation and the future of work, an issue that relates to both manufacturing and knowledge-based industries. This tool will also address industry-sponsored external customized training for students.

The key tool, "Placemaking," will instruct users on strategic facility construction and design and the role of research parks in creating vibrant innovation ecosystems and financing facilities.

The key tool, "Advancing Local Economic Development," will instruct users on how to promote local economic development. It will also urge users to define what "economic development" means to their university. Also, it will point out that universities in rural areas are the area's only anchor university and are, thus, the driver of economic development. Seizing this opportunity can open doors for the university to take part in the out-of-state or global economy. Research universities play an outsize in their community, and the community misses out if the university is not engaged. But, the community has to embrace the university. This tool will also cover the role of local government and regional economic development groups.

3.10.2 Recommendations

- Share the learnings from the workshop with the broader higher education community. Rather than a more conventional "proceedings" document, focus on a "toolkit." Be practice-oriented. Build upon best practices. Be responsive to real-world constraints.

- Target the toolkit towards the people who will be generating dialogue with stakeholders. This audience could be either inside a university or inside of economic development.

- Do not try to write every possible tool. Instead, write some relevant tools, and add more tools to the toolbox over time, if there is a demand. Check-in at UIDP meetings and ask for more successful local planning strategies that toolbox creators could add.

- Encourage users to evaluate their own needs to identify gaps before using the toolbox. Users can pick and choose the tools that address their gaps.

- Present the tools as problem statements. Map the problem statements to an example of the top five tools for a particular problem. Starting with a problem to solve could make the process more engaging.

- Include links to resources.

- Help users to tell a story and show the impact of each tool to gain support from all the key players. Do this for each tool because most people are not going to be able to ask for investment in everything.

- Proposed Structure for Write-ups of Specific Tools is a brief overview of the topic, fit for use in U-I outside of major metro areas, key features, success factors and key takeaways, resources required, best practice example(s).