

Research Planning at Nebraska: Research and Economic Development Growth Initiative (REDGI) 2012-2017

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Research planning is being transformed by the advent of big data and analytics. Robust mechanisms are available to determine whether our research activities and programs are meeting our goals and where to invest our resources, and can provide new ways to evaluate areas of innovation and excellence. The University of Nebraska-Lincoln's launching of the Research and Economic Development Growth Initiative is an example of the use of data and analytics in research planning.

The Context

The University of Nebraska-Lincoln was ranked in 2011 as one of the top U.S. universities in research growth over the previous 10 years. Faculty were publishing in top journals, pursuing large multi-disciplinary center grants with greater success and making discoveries that received national and international attention. The University leadership viewed this success as a foundation, and an impetus, for continuing growth in the years ahead.

Chancellor Harvey Perlman in his 2011 State of the University Address emphasized the need for increasing our academic stature and challenged the campus to continue its growth, setting ambitious goals for increasing our growth in research and economic development. The specific challenges presented by Chancellor Perlman included:

- To enhance the quality of research at UNL and increase total research expenditures to \$300 million, with at least half of this coming from federal agencies.

- To increase the academic stature of the university and double the number of faculty receiving prestigious national awards and memberships in honorary societies.
- With the establishment of the Nebraska Innovation Campus, to increase the number of faculty working with scientists in the private sector and translating basic and applied research into innovations and job creation.
- To increase enrollment by 20 percent, to 30,000 students.

In addition to the Chancellor's goals, UNL also remained committed to the research growth metrics set by the University of Nebraska Board of Regents, which call for UNL to increase research awards from federal agencies at a rate 20% higher per year than the national average, on a three-year rolling average.

Developing an Action Plan

The Office of Research & Economic Development (ORED) was charged with

carrying out the research growth goals, a mission that would require buy-in from research-active administrators, faculty and staff. From the fall of 2011 through spring, 2012, targeted forums with key audiences were held to discuss the key issues related to accomplishing the growth goals. In the 2012 spring semester, more than 300 faculty, administrators and staff participated in focused discussions and open forums, including:

- Deans
- Research Advisory Board
- New faculty hires within the previous 3 years
- Two meetings with department chairs/heads, center directors and deans
- Professorships (named chairs, university professors)
- A meeting open to all faculty meeting, with a webinar available

The forums provided information about the growth goals and solicited input on the strategies and the challenges and/or barriers to achieving the goals. Discussion included how best to increase research quality and academic stature, translating research to innovation, identifying key areas of research growth and new infrastructure needed, and identifying challenges. Following the forums the Research and Economic Development Growth Initiative was drafted by the UNL Office of Research and Economic Development and shared with the Vice Chancellors, Deans, Research Council, Research Advisory Board and the Associate Deans for Research, for their input.

The Research and Economic Development Growth Initiative (REDGI)

The Research and Economic Development Growth Initiative (REDGI) was

launched in the summer of 2012, with two broad goals: to enhance the quality and stature of research, scholarship and creative activity at UNL, and to increase the quality and quantity of industry-academia partnerships.

REDGI was a campus-wide initiative that included identifying expected outcomes and defining metrics and mechanisms for reaching them. ORED, in partnership with department chairs, center directors, deans and vice chancellors, would assist faculty in meeting the goals and provide leadership, services and infrastructure to support growth in faculty research and creative activity. ORED made clear that its primary mission is to drive excellence in research, scholarship and creative activity, and that this excellence can be demonstrated through many activities, including research funding, book and journal publications, citations, national honors, patents, business start-ups and more. But REDGI also would emphasize external funding as key to research excellence, and the primary factor enabling faculty to support more post-doctoral scholars, to hire graduate students and staff and to access other resources to support their scholarship.

A critical component of REDGI would be the use of analytical tools enabling tracking and quantifying of research and scholarly productivity, an increasingly difficult task. ORED had already developed NUgrant, a robust system for tracking research funding, and UNL had acquired licenses for using software systems (e.g., Academic Analytics, Elsevier products, Web of Science) to analyze research productivity using various measures. REDGI would take an inclusive approach, working with the Office of

Academic Affairs, the Institute of Agriculture and Natural Resources and the Office of Institutional Research and Planning to use these analytical tools to better understand UNL's scholarly strengths and relative market position among other research universities. Metrics would be a driving force for REDGI.

REDGI Goals, Metrics and Action Steps

Goal 1: Enhance the quality and stature of research, scholarship and creative activity at UNL

Metrics:

- Increase total research expenditures to \$300 million by 2018, with half coming from federal sources
- Increase the number of faculty engaged in extramurally-funded sponsored programs by 10% annually on a three-year rolling average
- Double the number of UNL faculty winning prestigious national awards and memberships in honorary societies

Meeting these metrics would require actions engaging faculty and administrators at all levels, creating faculty development programs, and investing in equipment, infrastructure and technology. A key action was to develop growth plans at the university, college and department (where appropriate) levels aimed at increasing total and federal research expenditures through 2018. These plans would include identifying strategic faculty hires – faculty to provide leadership in pursuing major centers or large-scale funded projects, to fill crucial gaps in research expertise, and to build critical mass for stronger interdisciplinary

teams. Enabling pre-tenure faculty to establish high-quality research programs early in their careers and re-engaging associate professors and professors in funded research would also be addressed.

As in any research enterprise, instrumentation and infrastructure are constant needs. Goal 1 emphasized investment in state-of-the-art research instrumentation and infrastructure to increase competitiveness. Tied to this was a campus-wide assessment of technology infrastructure needed to support the growth in research programs. Two areas identified as having high potential for growth were increased sponsored funding in the social sciences, arts and humanities, and developing a process for winning more prestigious national faculty awards.

Goal 2: Increase the quality and quantity of industry-academia partnerships

Relationships with industry are often framed by the potential for academic research to solve a particular challenge or problem. Developing strategic partnerships with industry creates opportunities for basic and applied research collaboration, technology commercialization and new venture formation, resulting in job creation and increased economic development in Nebraska and beyond.

In 2011 UNL had launched development of Nebraska Innovation Campus (NIC), a private-public research campus and designed as a driver of these critical industry-academia partnerships. Fueled by \$80 million in public and private investments, it is designed as an innovation hub where companies, entrepreneurs and UNL faculty and students work in a

collaborative environment that helps fuel Nebraska's economy.

Metric:

- Increase private-sector funded sponsored program expenditures by 15% annually

Actions to meet this metric required development of growth plans to increase research expenditures from private sector sources, increase proposal submission and subsequent funding from federal programs designed for university-industry partnerships, increase technology commercialization, and university-centric economic development. Nebraska Innovation Campus was critical to this goal, offering attractive opportunities for private sector companies to build synergistic research teams with University faculty and to participate in the education of the next generation of graduates.

2012: The REDGI Roll-out

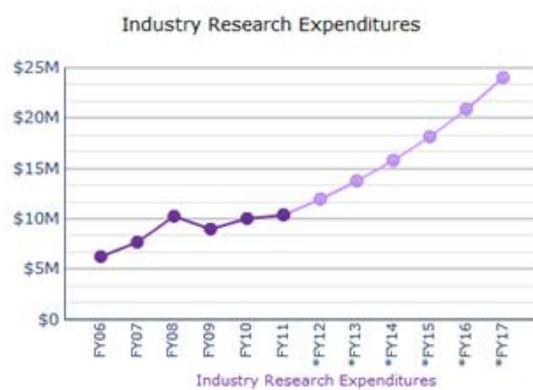
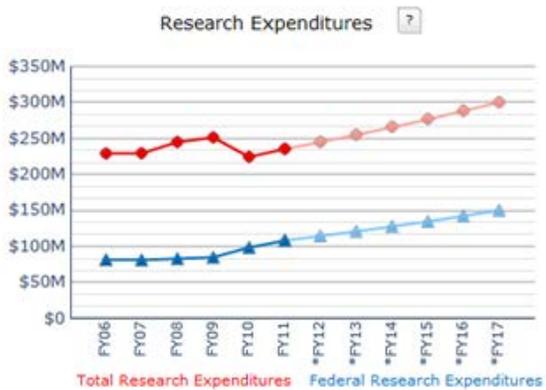
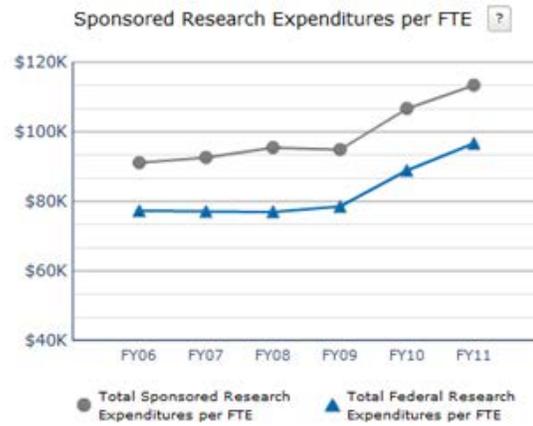
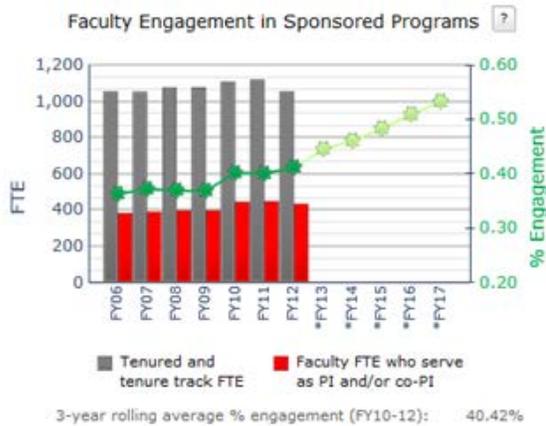
Introducing the campus to REDGI was simultaneously a promotion and education campaign to engage the campus in this new effort and the roll-out of a new platform for disseminating data and analytics that would enable faculty and

administrators to measure research outcomes and track their process toward the REDGI goals.

The roll-out included promoting REDGI to all faculty through the UNL and ORED websites, UNL Today news website, ORED's web-based Research News, and other venues. ORED met with research leaders to discuss and present the measurement process and the REDGI "dashboards," the key tools for evaluating progress toward the goals, and offered training in the use of the dashboards.

REDGI Dashboards

Dynamic monthly REDGI dashboards were developed and incorporated into the reporting module in NUgrant, UNL's electronic research administration system. Dashboards are available specific to the university, college and department levels. They are easy to access and use, giving a quick snapshot of engagement in sponsored projects, research expenditures, research awards by size and source and other key metrics. Executive leaders receive an updated published binder annually. On the following page is a screen shot of four engagement and expenditure dashboards.



Other Dashboards for other key metrics include:

- Total research expenditures by source: federal, industry, state etc.
- Federal research expenditures by agency
- Federal proposals success rate
- Sponsored proposals and awards per FTE
- Total amount of research award funding by size
- Total number of research awards by size

2017: How did we do?

UNL total research expenditures for just-ended FY2017 reached \$295 million,

nearly meeting our FY2018 \$300M goal. Although we will meet our total growth target we won't meet our federal goal, largely due to the end of ARRA funding – which occurred during our base year – and the current federal funding environment. The growth goals for industry funding were not met, but we exceeded our goals for faculty engagement in sponsored programs and exceed by almost double the number of prestigious national awards and memberships in honorary societies won by our faculty. Below are some key numbers.

Metrics

- Increase total research expenditures to \$300 million by 2017

FY2018 Goal: \$300M total

FY2016 Actual: \$295M total

- Increase private-sector funded sponsored programs expenditures by 15% annually
FY2018 Goal: \$24M
FY2016 Actual: \$13M
- Increase number of faculty engaged in sponsored programs by 10% annually on a 3-yr. rolling avg.
FY2018 Goal: 53%
FY2016 Actual: 58%
- Double the number of UNL faculty winning prestigious national awards, memberships in honorary societies
FY2018 Goal: 14
FY2016 Actual: 23

Successes Contributing to Future Growth

Nebraska Innovation Campus (NIC), conceived to boost growth of private-public partnerships and university engagement with industry, has become a destination for innovation and is meeting its growth goals. NIC has leased 94 percent of its current facilities and construction has begun on an 80,000-square-foot multi-tenant building to be completed in 2018. A recent Bureau of Business Research report showed that the annual economic impact from NIC business development and operations was \$139.9 million in fiscal year 2016. NIC now is home to 20 companies and more than 400 employees.

New research infrastructure on campus includes the Prem S. Paul Research Center at Whittier School, housing interdisciplinary research centers; the Voelte-Keegan Nanoscience Research Center; and Behlen Research Lab, home to defense research.

Lessons Learned from the REDGI Experience

Engaging leaders at all levels is critical to success. A gap in understanding between the Vice Chancellor for Research and some college Deans was problematic. The lack of a regular communication loop resulted in some colleges never really “owning” their metrics, and failing to develop individual strategic growth plans. The college that was most engaged ultimately saw the most success.

Our federal funding goals were set using the last year of the American Recovery and Reinvestment Act as a benchmark. In hindsight, this was unlikely to be an obtainable goal, especially given the current federal funding environment. Ensuring that UNL policies support and encourage an increase in industry-academia partnerships is an important action step.

Incorporating growth goals into the ‘story’ of our research institution is critically important. The messaging should come from all levels, and many avenues exist for communicating the goals, including mentions and updates in newsletters, annual reports, presentations to faculty, staff, Regents, and other venues. And, as with any new, large undertaking, new staffing is needed to achieve goals. New staff in industry relations is planned and the hire of a national awards coordinator in the past year has already significantly grown our number of awards.

Most important, developing strong, clear data measurements and analytics is critical. The monthly dashboards were particularly effective, especially in units whose leaders “trained” on them, and they are invaluable tools to the staff in ORED.