

# Executive Summary

## The Role of Universities in Promoting Scholarly Work in the Emerging Open Access World

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- There has never been as much change in our higher education institutions as we are currently experiencing. These changes include financial, student success, community outreach and area economic development. We are also required to think in ways to maximize the benefits that can be gained from these advances. One of the new, emerging movements is open access. This paper covers how open access research and scholarship fits with the university larger research and discovery mission, and what needs to be overcome to move it forward.
- Greater financial pressures on university budgets make it difficult for universities to commit to new initiatives such as open access. University libraries, key to open access initiatives, are really feeling the effects of less support and funding. There is a compelling case for open access to data--it could be good for research and discovery. The Human Genome Project is a notable success of open access for public good. Several successful open access projects have led to requirements to make some research freely available to the public. Another open access issue at universities is open access publishing. The cost of publishing has risen much faster than the funding, creating a difficult situation as universities will be forced to consider making cuts of journals that are vital to faculty and students in their fields.
- There are philosophical and technological obstacles to open access to data and publishing on campuses. A cultural obstacle to overcome is the buy-in to data sharing from researchers who generate data. Universities will need to develop partnerships with the private to sustain research missions, given flat federal funding. Data sharing for industry-related research will be challenging, as private industry will have an interest in keeping research private. Though, if our goal is advancement, we should be advocates for all data to be open access. Publishing in open access journal is not as prestigious as traditional publications, creating an obstacle for open access publishing as questions are raised about the effect on faculty reviews, promotion and tenure. Technological obstacles can impact open access efforts. Creating and maintaining an open access system, including the overall security, requires resources, which are dwindling at universities.
- The university's role in promoting open access scholarship should be discussed within a context of the campus priorities. Suggestions for additional roles universities can have in promoting open access include overcoming bias against

open access journals, rethinking outdated system of tenure and promotion, encouraging faculty to embrace open access data environment, and identify ways to efficiently build open access systems with institutions sharing expenses and system development.

### **Setting Realistic Expectations and Possible Career Pathways for Junior Health Professionals**

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- Supporting career decision-making in healthcare and health sciences is enhanced when options are mapped and described. Laying out pathway options, describing expectations coupled with likely outcomes that highlight research, teaching, entrepreneurship and business options are useful for both junior health professionals and mentors.
- Career path direction decision-making is a challenge for many young healthcare professionals.<sup>1-4</sup> Lent et al. use a social cognitive framework to understand three linked aspects of career development: (a) the formation and elaboration of career-relevant interests, (b) selection of academic and career choice options, and (c) performance and persistence in educational and occupational pursuits.<sup>5</sup> Social cognitive career theory supports the notion that self-efficacy informs career choices,<sup>4</sup> but a central issue remains that exposure to career pathway options and more importantly, clarity on what factors contribute to success once on those paths, remain elusive for many young health professionals. Offering realistic expectations early in career choice decision-making is essential to ensure cost- and time-effective investment for both the individual health professional and the system in which they seek career growth.
- Providing a roadmap approach to career options that lay out opportunities, goals and expectations for health professionals with M.D., D.O. and Ph.D. degrees may be of utility for mentors, individual scholars and others seeking to support young faculty. While career decision-making is multifactorial and driven by unique individual and environmental factors, the figures and tables included in the paper have proved useful heuristic tools for mentees and health professionals as they graduate and consider career options. The choices made will determine the expectations or possibilities of having research as part of the work.

## Valuing Collaboration and Collaborators

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- “Team Science” is the term often used for the collaborative activity that requires larger teams with specialized expertise to solve complex problem in and outside of the biomedical arena. There are many reasons to value collaboration including the ability to better compete in Team Science, the ability to fare better in reviews of collaborate grants and manuscripts, and higher citation rates for collaborative manuscripts. An environment that values highly technical expert team members is likely to retain these individuals. Community members too are required for many teams, serve in various roles, and become higher education and research advocates.
- There are other many ways to show that an institution values collaboration. The University of Nebraska and University of Nebraska Medical Center have implemented ways to show they value collaboration -- requiring evidence of collaboration for pilot grant programs, including a metric for collaboration for specific awards, and providing a full list of collaborators in announcements. Another thing to consider is if the distribution of F&A demonstrates the value of collaboration.
- Valuing collaboration may depend on the type of collaborator. Three types of collaborators are discussed: core directors, biomedical informatics collaborators, and clinician and community collaborators. Core directors who possess a breadth of skills needed to direct service centers are an institutional asset. Promotion and tenure may be more difficult for core directors and for this reason, many institutions have developed pathways for promotion. UNMC is developing an incentive stipend mechanism for core directors. Biomedical informatics specialists bring their unique skills to research teams as collaborators. Highly desired in industry, these specialists can ask for an compete for salaries, titles or other resources. As clinician and community collaborators are required for more types of research, academic health centers are including these collaborators in their compensation model and considering other nontraditional ways to show they value their contributions.
- Faculty who serve as collaborators should have a clear path to promotion and tenure, or another reward that shows they are valued by the institution. As team science grows, institutions need to create a culture to support it. Instruction in how to function in a team is needed, as this skill will be important.

## **New Challenges and Opportunities for International Research Collaborations on a More Level Playing Field**

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- The U.S. leadership in research and development (R&D) is being challenged, but at the same time new doors for international collaborations have been opened. T. Friedman's ten "flatteners" from his book "The World is Flat: A brief history of the twenty-first century" still apply today or have found a parallel version in international research collaborations. The ten flatteners are: collapse of the Berlin wall, Netscape (many countries have free internet access), workflow software, uploading (digital repositories), outsourcing, offshoring with American universities opening campuses in other countries, supply chain-ing, insourcing including recruiting and hiring international graduate students for US universities, informing (information tools), and "the steroids" such as digital mobile devices and now the cloud.
- The arXiv and the CMS Collaboration at CERN are two successful examples of open access and international collaboration. The examples speak of open collaborations, yet competition among countries in scientific research is escalating. Historically, the U.S. has led the world in science and engineering (S&E) with an emphasis on investing in science and engineering, research and development, and education. China and other Southeast Asian countries are now deeply investing in these areas and becoming bigger players. Though the countries and regions that have led in research and development expenditures continue a similar linear growth in expenditures, China has exceeded linear growth and now ranks second to only the U.S. in R&D expenditures. Several plots are offered which show how much Asia, and China in particular, have become much bigger players at the global level of R&D. Using linear regression projections, it is predicted that China will surpass the U.S. this year in gross expenditures in R&D and in 2020 it will surpass in terms of R&D expenditures as a percentage of gross domestic product. Several other metrics are presented which highlight China's progression in science and technology. The data show how much the U.S. relies on international students for its education and research programs in S&E.
- As other countries increase their investment in R&D, opportunities are provided to U.S. scientists and students. These investments provide such opportunities as international conferences and international exchanges of scientist and students financially supported by their countries of origin. The open access and free exchange of knowledge is supported by the Association of American Universities and the Association of Public and Land-grant Universities. Though, U.S. universities are challenged to balance openness with the federal export control regulations. Export control is a difficult compliance issue for many universities and more training, education and discussions are needed.

## **Recognition and Incentive: The Value of an Institutional Strategy for Faculty Awards**

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- Essential in considerations of open-access data and scholarship are implications for assessment of scholar and scholarship and, in particular, the role of open access on evaluation of researchers in the university environment and in particular on tenure and promotion. With the changes in how scholarship is pursued and evaluated, broader issues of evaluation in and recognition of achievement in the university are discussed in this paper.
- In 2011, a focus on awards became an institutional priority for the University of Nebraska (UNL). The goal of UNL was to double the number of faculty receiving prestigious national awards and membership in honorary societies. National awards and honors for faculty not only recognizes achievements, they enhance individual careers, builds department profiles, and increase the reputation of a university.
- The National Recognition and Awards Coordinator position is a full-time position that was established to promote, coordinate, and track awards. The Coordinator offers professional service across the campus in many ways from identifying opportunities guidelines, communicating with the award sponsor with questions, coordinating with nominators, compiling nomination materials, and help with faculty curriculum vitae. In addition, the Coordinator's work includes getting buy in for the value of this activity. The coordinator uses many effective strategies to catalyze the awards activities including an awards website, a promotions video, and a congratulatory letter from the Chancellor.
- UNL has exceeded the 2011 awards goal and has more than tripled the number of awards earned by faculty. The culture and leadership of individual departments plays a significant role in the awards success. Though there is still more work to be done, a dedicated position like the National Recognition and Awards Coordinator position at the University of Nebraska helps increase faculty awards and recognition and makes a difference to advance the university.

## **KU School of Medicine Mission-Based Allocation Model: aligning funding with expectations**

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- A decline in state funding at a time of increased enrollment forced leadership at the University of Kansas School of Medicine (KU SOM) to reconsider how financial resources should be distributed to best align with the school's mission in terms of research, education and service. The University of Kansas School of Medicine, like many schools, based faculty salaries on an historical model. The historical model presents many disadvantages so KU SOM decided to abandon the historical model for distributing state funds and move to a new mission-based funding allocation model that aligns with the School's missions and values. This new model would distribute available funds in proportion to fulfilling the missions of the department and school. In developing the model, several assumptions were applied to ensure that the system was fair, transparent, equitable and reflect market realities.
- The mission-based model directly aligns departmental compensation to performance. One of the school's primary missions is educating medical and graduate school students, which is acknowledged in the allocation model. KU SOM identified the educational activities that are valued and the associated faculty efforts for the activities. Research value is based on the effort devoted to externally funded research activities. This method places greater responsibility on faculty to seek and retain external funding and to participate in educational activities.
- The primary driver for state funds coming to a department is the cumulative activities of faculty. These activities are known, and therefore, in theory it is possible to know the value of an individual. A hypothetical example is given of the relation of externally funded research effort and valuation of faculty under the missionbased allocation model. A question that arises is if there will be sufficient funding to support faculty salaries at competitive levels with the mission-based allocation model. Through assessment of a department, they predict that between research incentive funds and funds released from individuals with effort exceeding the capped effort that this department could maintain a competitive salary structure.
- Though the mission-based allocation model provides a means for distributing limited state funds with the missions of the school, other sources of funding should be identified. Overall, the approach is having a transformational impact on faculty engagement. In order to attain equilibrium and financial stability, there is a need to monitor and adjust elements of the model as situations demand.

## **From Collegial to Collaborative**

### **The Long Road to Building a Sustainable and Standardized Research Technology Service**

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- In 2017, the author started as the Chief Information Officer for Kansas State, the nation's first operational Land Grant University. K-State published a visionary strategic plan with aspirational goals for 2025, with the goal of becoming a top 50 research university. Reporting directly to the K-State President, who formerly was the Chairman of the Joint Chief of State reporting to President Bush during the terrorist attacks, the author began his new position with a listening tour. On this tour, he spoke with many people to learn what was working, what was not working, and what they should be doing in IT.
- The IT environment at K-State is complex and led to many examples of duplicated systems, no formal sets of standards for providing services, few economies of scale, blind sides for needs of support, security issues, and users left on their own. The author chose to run a formal strategic planning process to create buy in. Working with a consultant, valuable input was gathered from more than 250 students, faculty and staff face-to-face, and 1,300 individuals through a web survey. What they found was that there were many challenges from a highly-decentralized nature of the institution. Coupled with budget cuts applied with no strategic application, the approach led to fighting fires and the inability for long-term sustainability.
- The decentralized culture that exists at K-State makes it difficult to provide a standard minimum-level of service, including supporting research. Researchers are spending a significant part of their start-up time on technology effort. Though the computer science department does run a high-performance resource, the service is informal and not utilized consistently.
- The development of the cyberinfrastructure needed to support research is a must. K-State will plan on following a standard strategic planning approach. A governance committee will be created to focus on developing and implementing a plan. Once a plan is developed, the focus will be on funding. The next few years will be an exciting challenge as K-State negotiates a path to develop and run the research technology environment for the twenty-first century.