Panel 3: Using Technology to Enhance Research and Scholarship

Panel Summary

New technologies to support research and scholarship, the products of both commercial and non-commercial entities, are constantly emerging and evolving. Evolving with these technologies is the nature of research itself, and this transformation raises many new questions for leaders of graduate institutions. More than ever, graduate deans and other university leaders must stay informed about new tools that can improve the research productivity of their institutions, discriminating among these tools and remaining attune to their potential costs and benefits for students and faculty. Tools for sharing, collaborating on, and assessing the products of research also raise questions about appropriate levels of institutional investments in research infrastructure.

Panel 3 brought together speakers from China, Singapore, South Africa, and the United States to explore three key topics and sets of questions that frequently emerge as universities develop and use technologies to improve their research outputs:

- *Expanding Access to Research and Scholarship:* What are the costs and benefits of expanding access to institutional research and scholarship? How does your university evaluate these costs and benefits when making decisions about providing access?

- *Tools for Collaborative Research:* How has your university used technology-enabled tools for the purpose of research and scholarly collaboration? What are the benefits of such tools? What resource investments are required to develop and maintain them?

- *Assessing Research Outputs:* How has your university used technology-enabled tools to assess research outputs? What are the benefits and limitations of bibliometrics and other metrics to assess the nature and quality of research outputs? How are resulting data used to enhance research quality at your institution?

While they formed the basis of three separate sub-panels, these topics proved to be overlapping. For example, bibliometrics can have multiple uses in the context of graduate education and research, allowing universities not only to assess research outputs but also to facilitate collaboration: they enable faculty to identify potential research collaborators, and, at the institutional level, they allow universities to better identify areas of strong institutional research productivity.

The first sub-panel, *Expanding Access to Research and Scholarship*, featured a number of different approaches to (and interpretations of) the concept of "access" to research through the use of technology. The presentation by **Lisa Tedesco** (Emory University) explored the benefits of providing access to new open-access tools for research and scholarship while also training graduate students to use new digital technologies in their teaching. Here "access" is implicitly

understood as access through unrestricted web portals, and Tedesco demonstrates that there is much more to this issue than the debate over "who pays" for authorization to use university resources. In the paper by **Shireen Motala** (University of Johannesburg), "access" is defined more in terms of the material capacity to access the Information and Communication Technologies (ICTs) that are at the core of global learning and knowledge-creation. Here "access" means also access to computers and bandwidth that makes it possible, in Motala's words, for a larger share of South Africans to be "producers" and not just "consumers" of knowledge. Finally, **Wu Daguang** (Xiamen University) focuses on new opportunities, largely in the form of grants and scholarships, for graduate students to publish in top-tier journals. Here "access" is a question of material support and incentives to produce top-level research. These different interpretations of "access to research" reflect the diversity of institutions and cultural perspectives included in this sub-panel as well as the multiple dimensions—legal, material, and motivational— involved in providing new technologies of and for research.

Access also continued to be a theme in the next paper, by **Kurt Sanford** (ProQuest), which highlighted the ways in which private-sector companies have driven enhancements in information-sharing and collaboration. One of the benefits of commercially-based websites (many of whose business models restrict access to authorized users) is that they are able to fund innovations and improvements in the way information is shared. Mr. Sanford's presentation highlighted the emergence of new tools such as "figshare," which allows researchers to share datasets and collaborate on joint research endeavors.

For the final subpanel, **Barbara Knuth** (Cornell University) and **Bernard C.Y. Tan** (National University of Singapore) described the use of new technologies for assessing research productivity at their institutions. Observing that you "can't improve (or change) what you can't measure," Dr. Knuth explained that Cornell has used technology-enabled data on faculty research productivity to design an increasingly subtle and powerful system for motivating faculty research productivity and teaching effectiveness, one that takes into account a broad range of specific and relevant measures of research output. Dr. Tan's presentation underscored a number of additional benefits of using technology tools such as publication databases in the assessment process: they minimize the time burden on faculty of preparing self-assessments and allow academic departments to "use chronological information to demonstrate their progress over time."

Discussion Themes

Discussion following the Panel 3 presentations gave considerable attention to the evaluation of graduate programs and individual faculty. One discussion theme centered on the appropriate uses of data collected through technology-enabled means. Some expressed concern that assessment technologies would lead to "formulaic" or unequitable approaches to assessing research outputs. Responding to this concern, Dr. Knuth emphasized that assessment can and should include multiple factors, and that metrics should be developed in conversation with faculty. She also stressed that universities must keep in mind the goals of assessment when determining the appropriate uses of data. For example, some assessments are most appropriate for starting conversations with faculty about the current strengths and weaknesses of programs, and ways to get a program moving in the right direction, rather than for the allocation of resources.

A related topic of discussion, one that concerns more directly the interface between evaluation criteria and technology, is the need for different measures for assessing the research outputs of different fields and disciplines. Many humanities scholars have noted that tools for

assessing the quantitative outputs of scientific research may be inappropriate to the Humanities and Social Sciences. **Alan Dench** (University of Western Australia) observed that some assessment schemes seek to address this problem: Australia's national research assessment study, the Excellence in Research (ERA), makes a distinction between assessments that can be conducted through technology-enabled metrics and those requiring peer review processes. At the same time, Dr. Mansfield speculated, advances in technology-enabled proxies for peer review may, over time, remove the need for such distinctions.

Both discussion threads were a reminder that assessment tools are inherently imperfect and require careful evaluation by the graduate leaders, faculty and staff that develop and use them. Dr. Knuth pointed out that it is nevertheless important to remain committed to the process in the interest of improving the quality of graduate education and research: "Part of aspiring to excellence is having a notion of what excellence is."