

REPORT

Technology in Higher Education

Reflections from the Bowen Colloquium on Higher Education Leadership

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On November 7, 2017, Ithaka S+R hosted the first Bowen Colloquium on Higher Education Leadership. Named for our late, founding board chair, William G. Bowen, the president emeritus of Princeton University and The Andrew W. Mellon Foundation, the event brought together 50 higher education leaders and experts to discuss current issues facing colleges and universities. The discussions were wide ranging and off the record. This paper presents our reflections—deeply informed by the discussion at the Colloquium—on one of the major themes discussed: technology in higher education. For more information on the Bowen Colloquium program and participants, including papers on the other topics discussed, visit <http://www.sr.ithaka.org/landing/the-william-g-bowen-colloquium>.

“Properly conceived, information technology will enhance, but not replace, traditional modes of teaching and learning. It will also permit the delivery of educational content to a wider variety of others interested in subjects that lend themselves to distance learning – at home and at odd hours.”

—William G. Bowen, “At a Slight Angle to the Universe: The University in a Digitized, Commercialized Age,” Romanes Lecture, Oxford University, October 17, 2000.

Students and faculty are connected on the network like never before, and that inevitably will change the way we work and learn.¹ Although those changes are already occurring, the use of technology to support higher education is an issue that elicits strong feelings among faculty and administrators alike. A number of important questions and opportunities arise when considering the impact of new networked technologies. Can higher education manage these technologies in ways that improve learning outcomes while also controlling or even reducing costs?² Can that be done in ways that are sensitive to other aspects of higher education’s mission, such as including and promoting the success of historically disadvantaged groups? And taking outreach one step further, can higher education develop ways to better serve society at large, by using technology to extend impact to the many people who crave education who cannot come to campus or who are at different stages of their lives?

¹The authors thank the following Ithaka S+R staff members for their contributions to this paper: Rayane Alamuddin, Melissa Bender, Jenna Joo, Kimberly Lutz, Elizabeth Davidson Pisacreta, Daniel Rossman, and Emily Schwartz.

² William Bowen, “Technology: Its Potential Impact on the National Need to Improve Educational Outcomes and Control Costs,” *Ithaka S+R*, last updated October 13, 2014, <http://www.sr.ithaka.org/publications/technology-its-potential-impact-on-the-national-need-to-improve-educational-outcomes-and-control-costs/>.

Many institutions are experimenting and implementing a variety of technologies to improve educational outcomes.³ At those institutions and for presidents who have more experience with seeing the development of these technologies from multiple perspectives (for example, by serving on technology company boards), there is the strong sense that technologies will indeed change the way students are taught and will learn. We are in the infancy of the development of artificial intelligence and adaptive learning technologies,⁴ but they will improve and they will have an impact, including controlling costs. This impact might not be felt for five or even ten years in traditional campus environments, but it is likely first to impact learning in disciplines where there is a “correct answer.”

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While the number of so-called traditional students is in decline, the number of adults and mid-career professionals who either have not completed their degrees or need more education or re-training is large and growing.⁵ Many of these potential students cannot take time out from their daily lives to attend school full-time and therefore this potential demand is not going to be met in the traditional way. Bricks and mortar educational solutions are going to be inadequate. This growing and large “demographic” offers a huge opportunity for higher education institutions both to serve their mission and increase the number of students they impact.

³ Martin Kurzweil and Daniel Rossman, “Faculty Collaboration and Technology in the Liberal Arts: Lessons from a Teagle Grant Program,” *Ithaka S+R*, last modified 29 January 2018, <https://doi.org/10.18665/sr.306354>; Jenna Joo, Deanna Marcum, and Daniel Rossman, “CIC Consortium for Online Humanities Instruction II: Evaluation Report for First Course Iteration,” *Ithaka S+R*, last modified 19 September 2017, <https://doi.org/10.18665/sr.304859>; Matthew Chingos, Christine Mulhern, Rebecca J. Griffiths, and Richard R. Spies, “Interactive Online Learning on Campus: Testing MOOCs and Other Platforms in Hybrid Formats in the University System of Maryland” *Ithaka S+R*, last modified 10 July 2014, <https://doi.org/10.18665/sr.22522>.

⁴ Jessie Brown, “Personalizing Post-Secondary Education: An Overview of Adaptive Learning Solutions for Higher Education,” *Ithaka S+R*, last modified 18 March 2015, <https://doi.org/10.18665/sr.221030>.

⁵ “Demographic and Enrollment Characteristics of Nontraditional Undergraduates: 2011-12.” U.S. Dept. of Education, NCES 2015-025, September 2015.

Mechanisms will be pursued that offer quality instruction online and in hybrid modes that are tuned to these students' needs, their available resources, and their schedules. Some traditional universities have responded to that demand over the years through various continuing education programs, and the for-profit sector has also been active, but the pace of change and the changing needs in the workforce have increased the scale of the opportunity. More traditional colleges and universities are seeing that demand, but in general are moving slowly. One lesson from the experience gained so far seems to be that online teaching and learning technologies and processes are effective in the delivery of master's degrees at much lower cost points, such as with Georgia Tech's Computer Science program. Although for the most part the online learning tools are not being tuned to the undergraduate on-campus experience, the productivity advances that will be revealed from offering education in these new ways could also increase students' welfare in residential environments by improving outcomes and/or controlling costs.

Colleges and universities are beginning to respond to these opportunities, especially through partnerships with super-institutional providers of online learning such as Coursera, Udacity, and edX that are delivering online courses to interested learners of all ages all over the world. These providers are beginning to offer badges, credentials and certificates to meet the corporate and lifelong learning markets. It has been reported that Coursera's revenue is now over \$60 million and growing.⁶ EdX recently announced that they have 15 million learners, 130 partners, and are offering micro-masters degrees and a full first-year's worth of credit through a partnership with Arizona State University.⁷ This is going to be a growing and competitive environment, with a variety of firms responding to the demand in the marketplace for such educational opportunities outside of traditional college and university programs. Colleges and universities might do well to see beyond how technologies might bend the cost curve, or impact learning on campuses, and instead consider how these new technologies can dramatically increase access to knowledge and magnify these universities' impact on society in a profound way.

Even assuming that the forces described above are operating and will inevitably bring change to higher education, there remains great uncertainty about how and when on-campus education will evolve from where it is today to using significantly more technology to improve outcomes and reduce costs. The challenge there is to find the means and the resources to assist institutions to evolve in ways that harness the power of technology and contribute to increased access and student success.

⁶ Dhawal Shah, "Coursera's 2017: Year in Review," Class Central, last updated December 31, 2017, <https://www.class-central.com/report/coursera-2017-year-review/>.

⁷ "EdX and Arizona State University Reimagine First Year of College, Offer Alternative Entry into Higher Education," EdX, last updated April 22, 2015, <https://www.edx.org/press/edx-arizona-state-university-reimagine>.

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In some institutions, major constraints to innovation are the existing teaching and learning infrastructure and the faculty, who need to see evidence that new approaches will be beneficial in order to change their approach. More research needs to be done to assess how new uses of technology can improve student outcomes while also supporting faculty's needs. Much of the initial attention to the potential of technology in revolutionizing teaching and learning implied that technology would reduce costs by being used primarily to displace faculty. It is understandable that large numbers of faculty have not been supportive of this kind of innovation if that is the expected result.

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There are two components of the answer to this question for which we need to collect more evidence. First, no solution or approach is the best for every instance. Some forms of learning in some disciplines will benefit from the use of technological tools, while for others the benefits will be more limited. The goal should be to use the right approach for each case, and thereby using the most economically productive approach for repetitive tasks while saving faculty interaction for higher value engagement. Second, if we are to increase educational attainment for all kinds of students, even those not served by the current system, there is every reason to believe that we can embrace technology to reach many, many more students and therefore increase the demand for faculty at the same time. This could be true not only in the traditional age population, but also among other demographics as well, including helping people from all over the world who don't have a

BA attain one and also helping people in the labor force gain the skills they need, whether through a degree or some other certificate or credentialing.

Next steps

To some degree, the potential for technology to impact higher education is highly dependent on external third parties working to develop tools and capabilities to support new forms of learning and support. That said, we see four important next steps for institutional leaders and the broader higher education community:

1. Foster dialogue and engage faculty leaders on campus in active experimentation with new learning technologies that offer students opportunities to engage in learning outside the physical classroom.
2. Assess the prospects for providing education to constituents beyond the traditional campus community.
3. Collect and assess data on student performance and educational outcomes (while respecting individual student privacy) to inform and guide use of new learning technologies.
4. Study best practices, challenges faced, and experience with different vendors, and the economic implications faced by other institutions incorporating learning technologies into the curriculum.

Taking the steps above should position higher education leadership to take the best advantage of the evolving technology environment. As learning technologies continue to improve, including advances in machine learning and artificial intelligence that will lead to better adaptive learning systems, it may be possible to increase the productivity of learning and instruction. That should lead to the possibility of increased levels of attainment and a slowing of costs per student in traditional environments. Achieving that productivity gain is going to take time, and it behooves us to continue to conduct research to inform the community about these developments to ensure that our focus remains on improving educational outcomes for more students, and never turns toward cost savings for their own sake. Overemphasizing cost-savings would only lead to a further widening of gaps in attainment of post-secondary degrees, and, more important, the knowledge and earning power that comes with them.