

Profound, Rapid and Discontinuous: The Influence of Information Technology on Research Universities

Advances in information technology are sure to revolutionize both education and the marketplace, irreversibly altering higher education by affecting the quality of research, teaching and engagement with the public. Indeed, I believe that Internet-based changes now taking place are profound, rapid and discontinuous. I also believe, notwithstanding the slowness of adaptation in many colleges and universities, that nowhere will these transformations be more prominent than in research universities. There, preliminary signs are already obvious that the conventional constraints imposed by space, time and institutional boundaries are dissolving. And the nature of scientific inquiry, scholarship and collaboration is being altered.

These realities were well illustrated by participants at two recent workshops. On February 14, a special workshop on the "Impact of Information Technology on the Future of the Research University" was held at the National Academy of Sciences in Washington, sounding a theme reprised on June 19 and 20 at the National Research Council's Government-University-Industry Research Roundtable, which sponsored a discussion on "Transforming the Missions and Output of Research Universities for the 21st Century: Will Information Technology Be the Critical Driver?" An exciting group of information-technology futurists speculated on the form and function of a connected scholarly community. The deliberations of the first conference can be viewed directly at <http://www.researchchannel.com/programs/nap/ITRU.html>.

The futurists advised that it is no surprise that the financing, management and governance of research universities will be affected by new digital technologies. There are profound implications as well in providing economical access to highly motivated students who cannot physically be present in a laboratory or classroom discussion. Already we see revolutions in publishing: submitting manuscripts, facilitating peer review, electronically accessing materials from specialized library collections. Sharing research materials or remotely operating instrumentation are likely to become routine, and we all look forward to the day when we can avoid flying across the continent to participate in important conferences, under conditions in which technology-enabled interactions are better than being there.

But perhaps the most important influence information accessibility will have on higher education is in the improved way that students and their professors can interact, transcending the tyranny of the clock and enhancing the time spent in informed discourse, while maintaining the value of a common place for social interactions. In this new world, how will we define a student? A faculty member? Will a professor become the manager of a team of professionals who focus on instructional design and the evaluation of conceptual mastery? Or will a professor be solely focused on cross-disciplinary innovation in global "collaboratories"? Will universities remain dedicated to individual discovery? Will they retain their monopoly on credentialing?

There will likely be as many expressions of these opportunities as there are diverse institutions. With no inexorable march to a uniform model, serious intellectual discussions will be needed on every campus. The compelling challenge is to embrace these changes while maintaining our traditional core academic values of freedom of rational inquiry and liberal learning.



Marye Anne Fox
President, Sigma Xi

Sigma Xi, The Scientific Research Society, was founded in 1886 as an honor society for scientists and engineers. Today the Society actively promotes scientific research and the promise of science and technology. Its goals are to foster interaction among science, technology and society; to encourage appreciation and support of original work in science and technology; and to honor scientific research accomplishments. Approximately 75,000 scientists and engineers are active members of Sigma Xi in North America and abroad. There are more than 500 chapters at academic institutions, government laboratories and industry research centers.

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