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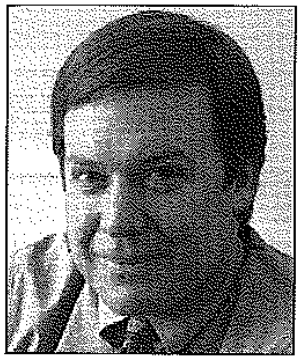

New Media and the Changing Context of University Outreach

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The digital revolution poses tremendous challenges for universities in America and around the world. Not only does it cause them to reflect upon how they organize for their core functions of teaching and research, it also forces universities to reevaluate who they see as their different constituencies as well as the contribution they can make to these constituencies. Computers and the Internet have already demonstrated the promise of asynchronous, asyntopic, multi-media exchange, and learning. Now, the onslaught of broadband technologies provides us the opportunity to accentuate the virtues of the current technology while introducing richer, interactive experiences that take advantage of the rich content resident on university campuses.

It used to be that teaching could only take place either when students came to the campus or when the campus extended its resources to particular groups. In this paradigm, the time and resource constraints of both students and institutions have, historically, limited the number of students seeking higher education. This paradigm has also severely limited students from pursuing lifelong learning for professional development or personal edification.

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Computers and the Internet have already demonstrated the promise of non-traditional teaching and research approaches. However, we have not yet identified how digital interactive media will alter the functions of the university.

Historically, universities have contributed in a variety of different ways to society, as they have experienced their ups and downs. Since the establishment of the University of Bologna and the University of Paris in the 1300s, universities have sought to contribute to society by advancing and training students in the high professions through

faculties in the arts, theology, law, and medicine. This "elite" strategy reflected the ideology of the institutions, the extant social structure, as well as the technologies underpinning learning at that time. First, European universities were guided by the assumptions of the church, which played a strong role in shaping what was considered acceptable scholarship at this time. Second, prior to the development of a dynamic commercial class, these institutions were often developed to reinforce the extant social structure. Third, without the printing press, learning materials were scarce and quite costly to reproduce on any scale.

In the seventeenth century, hundreds of scientific societies and academies emerged to challenge the antiquated university curricula that stood opposed to the principles of the Enlightenment, only to reinvigorate universities as centers for scientific advancement and technological change. Through this, universities began serving a new societal function by pushing back the frontiers of knowledge about fundamental phenomena and fundamental technology. It was the Enlightenment belief that these advances would lead directly to concrete societal benefit.

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Universities have now been on this path for several hundred years. Throughout all this, the most significant forms of public service and outreach undertaken by universities were in the training of the elite professionals and in forging ahead in discovery and invention that would eventually come to greatly impact society.

In the American context, the watershed departure from this pattern was the establishment of the land-grant colleges, which were dedicated to the education of the "sons and daughters of farmers and mechanics." The democratic impulse this brought to American institutions of higher education was profound, and it has carried through to make the post-World War II era, characterized by large-scale federal and state investment in universities, the most exciting era thus far for knowledge generation.

Just as the rise of modern science transformed the form and function of the university, along with its mode of public service, the development of digital interactive media presents us with the possibility that universities may yet again significantly alter their public roles.

For the first time, it may actually be possible for continuing education to be lifelong learning. As never before, the rich learning resources that have been locked away in libraries, film and music vaults, and irretrievably lost in the lecture rooms can be stored as bits and bytes, relationally linked to each other, and made accessible to the world. Communities of interest, unconstrained by the huge transaction costs imposed by geographic dispersion and synchronous

coordination, can be developed that allow people to explore various fields of knowledge without being enrolled in classes.

But what will be the role of the university in all of this? It is clear that it is becoming a world in which the "sage on the stage" makes way for the "guide on the side." In significant ways, the rich digital interactive resources will constitute their own learning environment. The public service and outreach aspects of universities will often be mediated by digital interactive media. It is perhaps the only way that we will be able to make accessible all of the knowledge that is pent up within our walls. But to look at it a different way, the types of value added universities provide will likely adapt to a world in which people learn anyplace and anytime. Public service and outreach will change profoundly.

How will universities cope with this change? How will it affect the standard human resources model of professors, graduate students, and post-doctoral fellows? How will our standard categories of semesters, classes, examinations and tenure survive the tumult of the digital revolution? These are all open questions at this point.

However, the older organizational imperatives will never disappear. Universities will continue in their role of training professionals and advancing fundamental knowledge in the sciences and engineering. For instance, someone will have to develop and codify the new body of knowledge relating to interactive design, as well as train the professionals that will enable the broadband digital revolution. This will be no small feat. But, it will be a very important public service. ■

About the Author

Michael M. Crow (Ph.D., Syracuse University) oversees Columbia University's research enterprise, technology transfer operations, strategic research investment fund, interdisciplinary program development and an assortment of special projects. Prior to moving to Columbia in 1991, Crow was director of the Institute for Physical Research and Technology at Iowa State University.

Crow's dissertation, relating to the structure and performance of energy laboratories, served as the basis for the National Comparative Research and Development Project (NCRDP) which culminated in his new book (with B. Bozeman), *Limited By Design: Federal Laboratories in the U.S. National Innovation System*, which draws upon fourteen years of NCRDP work. He is the author of many articles and editor of several books relating to the analysis of laboratories, technology transfer, strategic research and development management, research universities, science and technology policy, and the practice of theory of public policy.

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