The Globalization of the University

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We are living in an age of unprecedented intellectual discovery, an era in which knowledge doubles every twelve to fifteen years in the sciences alone. Thanks to revolutionary advances in telecommunications, we are also living in an age of unprecedented dissemination of knowledge. Our rapidly expanding ability to share information and ideas is leading to what can be called the globalization of the university. By "globalization" I mean the forces that are transforming the university from an institution with a monopoly on knowledge to one among many different types of organizations serving as information providers, and from an institution that has always been circumscribed by time and geography to one without boundaries.

For universities, globalization means:

· Information and communication technologies—the Internet and the World Wide Web, streaming and interactive video—are providing powerful new tools to forge global networks for

teaching and research. To date, most forms of online learning have relied on platforms that are too primitive for high-quality interactions. Dramatic educational breakthroughs will occur when the platform is versatile enough to support rich visual and auditory displays, reacts quickly to student inputs, can acquire and use information about an individual student's style of learning, and is reliable and easy to use. The prerequisite technology may not quite be here yet, but it will be soon, especially with the introduction of high-speed wireless platforms.

· In this new environment, one organization—whether it is a university or a private corporation—can serve the needs and reap the rewards of worldwide markets. The global university could teach students anywhere (and thanks to the Internet, at any time) and draw its faculty from around the world.

· Universities no longer have a monopoly on the production of knowledge. They will be competing with suppliers of information and ideas who have no need of expensive campuses, athletic fields, or faculty clubs. In a much-quoted interview a few years ago, American management expert Peter Drucker said that "thirty years from now the big university campus will be a relic. Universities won't survive in their present form. The main reason is the shift to the continuing education of already highly educated adults as the center and growth sector of education."

And indeed, competitors to the traditional freestanding university are springing up around the world. They range from for-profit ventures like the University of Phoenix and Fathom.com, to equity stakes in private companies (UNext.com, for example, enlists universities to provide course content), to licensing agreements of various kinds, to university

consortia like Universitas 21, a group of eighteen European, North American, and Australian universities, or the Alliance for Lifelong Learning, organized by Stanford, Yale, Oxford, and Princeton universities. Investors poured billions of dollars into online learning last year, and projections are that it is a growth industry. The United Kingdom has announced its intention to establish an e-university, and the European Union plans to do the same.

The enormous international demand for technical and professional training will encourage new providers of higher education to cross boundaries and offer teaching anytime, anywhere. But we do not know whether a large enough global market will emerge for online education; whether most students will choose subjects that promise immediate financial or career benefits, as opposed to liberal arts curricula; or whether traditional higher education will dominate the market. This is an entirely new world for which there are no models.

For universities, the biggest challenge of globalization is to their institutional structures and habits of mind. I would like to briefly discuss three issues that globalization raises for universities: accreditation, intellectual property, and maintaining the university as a community.

ACCREDITATION

Technology may be making the university global in its reach, but some things about education remain stubbornly local. One of those things is accreditation. A major aspect of education is its role in credentialing students—those who pass the appropriate courses or examinations receive a degree. Educational

institutions can credential students because they are licensed to do so by governmental or quasi-governmental agencies, whether national or local. But there are no global accrediting bodies, which is one reason critics of online learning view it as a threat to academic quality. Universitas 21, the consortium of universities I mentioned a moment ago, is betting that one of its degrees will have the same value in the academic marketplace as a traditional degree from, say, the University of California or the Nagasaki University of Foreign Studies.

But can an educational institution really accredit students anywhere in the world? For the kind of professional and corporate training that Peter Drucker mentions, perhaps the answer is yes. However, for traditional undergraduate and graduate education in the arts and sciences, the answer is far from certain. The University of California consists of ten campuses, and credits earned at one campus are not automatically transferable to another. If such a barrier exists between campuses within a single university system, what are the barriers likely to be between nations? When I was a faculty member at Stanford University in California, some of my graduate students were French. Many did years of graduate study at Stanford but returned to the University of Paris when the time came to write their doctoral dissertations, even though the work leading up to the dissertation had been done at Stanford. Why? Because submitting their thesis to a French university meant a French degree, and all the opportunities for advancement a doctoral degree from the "right" university bestows on an ambitious young French academic. A degree from a foreign university would not open the same doors or have the same value. Students have a finely honed instinct for such matters.

This is not just a question of rules and regulations but of reputation and confidence. People tend to have confidence in institutions they know, and most of those institutions are local. The value of state and local colleges and universities will remain despite the universality of the Web.

INTELLECTUAL PROPERTY

A second challenge globalization presents is also something of a paradox: while Web-based learning is creating new avenues to knowledge, it is generating new constraints as well. Universities, by long tradition, share knowledge freely and widely. But in a society in which they are no longer the dominant creators and disseminators of knowledge, the rules of the game change dramatically. Universities have less and less access to intellectual output as control of scholarly communication continues to be commercialized and concentrated among a few large companies like Reed-Elsevier, which is notorious for soaring journal prices and high profit margins. And individuals and institutions in the private sector that offer courses or conduct research expect to be paid for the use of their intellectual property—as do some universities that are beginning to market courses online.

This trend has been described as the "privatization of knowledge," and it is a challenge to the role that universities have played for centuries as places where information and ideas are open to anyone. Because we are a knowledge-based society, however, ideas and their applications bring new wealth that can be difficult to resist—wealth that hard-pressed universities can use for such worthy ends as increasing faculty salaries or otherwise supporting the academic enterprise.

But this is a controversial area for universities. Just last month, the Massachusetts Institute of Technology drew worldwide attention when it announced that, in "an effort to create a model for university dissemination of knowledge in the Internet age," it would make available to anyone on the Web the materials used in courses taught at MIT. This program, called OpenCourseWare, is expected to cost one hundred million dollars, which the university hopes to pay for through private gifts, and take ten years to complete. It is also voluntary; MIT faculty who do not wish to participate are not required to do so. OpenCourseWare is not unique in making course materials available on the Web—many faculty at the University of California and elsewhere do the same thing. But no other institution has done it on this scale, and planners at MIT regard the OpenCourseWare program as a statement about preserving the basic mission of the university in an increasingly commercialized academic environment. In this new world, intellectual property issues are taking on vast new importance.

THE UNIVERSITY AS COMMUNITY

There is another issue raised by globalization in addition to accreditation and intellectual property: the traditional organization of university life. Globalization challenges universities to overcome the ancient competitiveness of academic institutions. Universities in the United States and elsewhere have always competed with each other for faculty, students, resources, and prestige. Even within a university system, campuses compete with each other; faculty do not have tenure within the University of California system, but at a specific U.C. campus. Consortia

like the Alliance for Lifelong Learning, whose members include Oxford, Yale, Princeton, and Stanford universities, try to bring together institutions that have long been rivals. The globalization of the university is giving birth to new forms of cooperation, but it is also generating more competition, not less. It is too soon to know whether the pressures for cooperation will turn out to be stronger than the habit of competition.

And it is far from certain that online learning will be welcomed enthusiastically by faculty in every discipline. One promising area for online learning is basic courses in subjects many students take, like composition or calculus. As online courses become more sophisticated, they may reach the point where faculty do not need to be involved at all. The faculty who teach these classes, however, are also the faculty who conduct the research necessary to future advances in the field. This reality applies to disciplines across the board: if basic classes in major disciplines were to migrate entirely online, there is reason for concern about what happens to faculty in research universities, who keep their disciplines and their institutions at the forefront of discovery.

Further, some faculty see online learning as a threat to quality, that fundamental value of academic life. If faculty are involved in online learning to the same extent they are in a real classroom—responding to questions, evaluating student performance, preparing course materials, advising on future courses a student might need—the cost to the university doesn't vary much from the cost of offering a class on campus. But if faculty are not deeply engaged in shaping students' course of study, how do we ensure that students get an excellent education?

The answer to these questions is: we don't know yet. One of the most fascinating imponderables involves the coming

generations who will benefit from the new learning technologies. We do not know enough about the students of the future. Will these students, raised on the Web, want the same kind of education their parents did? When Stanford University began offering students the option of taking engineering classes online, many deserted the classroom entirely. We know that, at U.C., students frequently resort to the Web rather than to the campus library as a source of information. Given a choice, many will not choose an online video lecture as a substitute for attending classes, especially if the lecture is excellent. But students do use online lectures as study aids. Student choice—and perhaps student demand for more attention and service from their online professors—could be a powerful shaping force in future online learning.

WHAT WE KNOW

There are some things we do know. Scholarship and research are the foundation of the research university; education based on something other than those two activities is not in its tradition. This means that faculty, as the source of the central activities of the research university, must be deeply involved in forging the response of their institutions to the challenges of globalization.

We also know that, so far at least, no other organization has emerged that rivals the research university in the two vital activities of scholarship and research, or capitalizes as well on the way research and teaching nourish each other. And so far no other organization offers the array of services universities encompass, from the residential undergraduate experience to cultural events for the community to (in America at least) football

for the alumni. Research universities are also where some of the most exciting experiments in online learning are taking place.

Because I have highlighted some of the problematic dimensions of globalization in these remarks, you may think that I am less than enthusiastic about the revolution in learning brought on by the new technologies. Nothing could be further from the truth.

For one thing, the new technologies are going to make it easier for students and faculty from different cultures and countries to work together. In March, the University of California and a number of Mexican universities celebrated the completion of a high-speed link, known as Internet2, between California and Mexico. Internet2 will make possible revolutionary Web applications that support collaborative teaching, research, and other cooperative ventures between the University of California and Mexican universities.

Here in Japan, U.C. is involved in a first-of-its-kind experiment in international academic cooperation called TIDE—that stands for Trans-Pacific Interactive Distance Education. In the fall of 1999, Kyoto University and U.C.'s Los Angeles campus (UCLA) began offering a course in physics taught simultaneously on both sides of the Pacific. Lectures delivered at one university are transmitted to the other through a high-speed link. Students at both locations can ask questions—and receive immediate answers—from the professors and get involved in discussions with other students. Lectures, assignments, demonstrations, and class interactions are archived so that both students and instructors can access them whenever they want. The program has been expanded to include introductory physics, communications studies, applied linguistics, and economics. It is a valuable lesson not only

in technologically mediated instruction, but also in how students from different cultures interact in a classroom setting and how to create a collaborative learning environment.

Still another example will be of particular interest to you because it involves language acquisition. University of California faculty are launching a project that will use computers, multimedia, and interactive Web sites to teach the Spanish language. Called "Spanish without Walls," it will be a completely virtual course, taught entirely outside the classroom. CD-ROMs will allow students to take an interactive tour of all twenty-one Spanish-speaking countries, hear the dialects of different regions, and see videos on each country's culture and geography. Plans are to test the effectiveness of the course in spring 2002 by comparing the language proficiency of students who participate in Spanish without Walls this fall with that of students who take Spanish in a traditional classroom setting.

The new technologies are presenting other intriguing opportunities. One is the chance for controlled experiments on optimizing the learning process. We can create an online course with several variations, in which some students take one variant and other students take another. As students progress through the different variations of the course, we can collect data online that will enable us to test different hypotheses about the nature of the learning process. What we will have, in effect, is an educational laboratory that can answer important pedagogical questions: What is the optimal order in which to present ideas to make them easier to grasp? As a course unfolds, it should not unfold the same way for everyone. How can we tailor courses to the idiosyncratic abilities, motivations, preferences, and proclivities of each student? It is possible to devise course programs

that maintain an online history of the student's performance and, based on that history, present course material in a way that is best for that particular student's learning style. The potential for truly individualized instruction is enormous.

For all its revolutionary possibilities, online learning is not going to spell the end of the university. Peter Drucker is wrong. Just as television and satellite TV have not replaced the live theater—which has a history going back millennia—so the new forms of learning are not going to displace the old. Rather, they will continue to develop in parallel, each with its own distinctive advantages and limitations. Most online courses, for example, cannot be mounted on a shoestring; like movies, they can reach many people, but they also involve a great deal of technical talent and very high production costs. Not every course is worth the expense; some courses are more appropriately done in the time-honored fashion, just as some plays are more compelling when they are performed in a small theater rather than on a big screen. Ultimately, there will be a balance between Web-based and traditional efforts. Research universities are not going to be swept away in a technological revolution. They will change and adjust in an incremental way. So those who worry about the future of the university, in my view, would be better off worrying about something else, like how universities are going to pay for the technological infrastructure online learning demands. (The state of Missouri has found an entrepreneurial answer for its elementary and high schools: it has levied a tax on movie rentals to fund information technology.) One thing is clear: globalization is challenging universities to rethink their organization and responsibilities so that they can respond creatively to the new world they have helped

to bring about. Among the possibilities globalization offers to individuals and institutions is the opportunity to contribute to the common good.

CALIFORNIA DIGITAL LIBRARY AND ESCHOLARSHIP

So far I have talked mostly about the contributions of the new technologies to teaching. Let me conclude with examples taken from the areas of research and scholarly communication. These examples are just a few of the many things going on at the University of California and its affiliated laboratories.

With the help of technology, the University of California has created the California Digital Library (CDL), a collaborative library in which our ten campuses share a knowledge commons. A major strategy for taking advantage of technology, the CDL was founded with the belief that knowledge resources should not be constrained by the size and location of an institution. U.C. does not need ten separate digital libraries. The CDL is a framework through which the University is leveraging its collective investments in scholarly content, in technology, and in human resources to meet challenges of the digital age and to address the burgeoning quantity of scholarly publication. Its primary goal is to seek innovative and cost-effective means to achieving comprehensive access to scholarly and scientific communication for all members of the University community.

Although the CDL has been successful at expanding access to digital publications, we recognize that the only way to achieve this goal of comprehensive access will be for institutions to play a much more active role in the dissemination of knowledge. Over the next decade, a significant challenge for research universities is

to influence and develop sustainable models for managing scholarly information, including its production. Although the current mechanisms and relationships among authors, institutions, and publishers are firmly entrenched, I believe that technology makes this an auspicious time for universities to catalyze change, and have thus committed U.C. to playing a leadership role in supporting that change. Universities contribute to the shared pool of knowledge and depend on it for research and teaching, but engagement in these complementary activities is not generally linked. At U.C., we are bringing these activities together through CDL's eScholarship program.

The University's eScholarship initiative is a vehicle through which we are supporting faculty in their desires to innovate in scholarly communication; eScholarship provides a technical and organizational infrastructure to support dissemination of knowledge as well as to ensure long-term preservation and access. It is an experimental effort to test the capacities and costs of Internet-based publication models. Working with discipline-based communities over the past year, eScholarship has opened three digital repositories, has supported two new, digital, peer-reviewed journals, is collaborating with the University's press to create entirely new kinds of monographs that are linked to rich primary resources, and has begun to explore collaborations with scientific societies. We will learn from these experiments, and we need to be joined by others for universities to play more than a passive role in acquiring the knowledge upon which our research and teaching depend.

Finally, a story about how the new technologies are helping us identify and develop talent. The *New York Times* recently carried a story about a young Czech physics student who posted a paper on an electronic archive run by the Los Alamos National

Laboratory, a nuclear research laboratory managed by U.C. for the United States Department of Energy. The paper concerned an area of physics known as string theory, a topic few faculty in his university knew much about. The Los Alamos archive attracts two million visits a week, and as a result the paper came to the attention of some of the world's leading physicists in string theory. They found the undergraduate's work so impressive that efforts on his behalf eventually led to a scholarship to do doctoral study at an American university.

As this incident dramatically illustrates, technology is erasing boundaries and creating an international community of learning—"a new realm of research," in the words of the *New York Times* story. The Los Alamos archive enables scientists virtually anywhere in the world, however isolated or lacking in access to scientific equipment, to gain access to the cutting edge of discovery. Just as important, through the archive they can become involved in an international dialogue about the latest developments in their field. These outcomes would have been impossible even fifteen years ago.

Together, global connectivity and university leadership can create new patterns and new roles in teaching, scholarship, and research, and access to all three. It is up to us—and especially the faculty, who are the heart of the academic enterprise—to ensure that the new learning technologies serve the important goals for which universities were created centuries ago.

NOTES

These remarks were delivered at the inauguration of President Akimasa Mitsuta, Nagasaki University of Foreign Studies, Japan, May 26, 2001.