Current Innovations in U.S.Higher Education:
Technology and the Virtual University
アメリカ高等教育における革新動向
ーテクノロジーの利用とバーチャルユニバーシティー

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An innovation is anything that is considered to be new by those implementing it, and of course there are many new things happening in U.S.higher education. We are constantly in the process of altering structures, governance systems, finance policies, admissions processes, degree programs, campus life policies, and faculty affairs systems, among other things. But in this brief presentation I want to focus on the increased use of technology in higher education, and relate it in part to the issue of faculty tenure. I believe these issues of technology and tenure are important in Japan as well as the U.S., so that some of what I say may be applicable here as well.

Technology and education

The use of computers and related electronic technology is spreading rapidly on U.S. campuses. The latest annual survey shows that about half of all faculty members have a computer, and that the proportion of courses using technology is rising (DeLoughry, 1996). As examples, 25% of all courses now use e-mail in their instruction, 27% use computer-generated presentation handouts, 24% use computer classrooms, and smaller but still substantial percentage of between 10 and 18% use computer simulations, commercial courseware, multimedia, or CD-ROM based materials. In addition to its growing classroom use, the importance of technology can be assessed in indirect ways as well. For example, the weekly *Chronicle of Higher Education* now has a regular "technology" section, just as it has one for "faculty" and one for "students." For another, there are now publicized national rankings of institutions based on their use of the Internet (McCollum, 1997). This suggests that the use of technology now influences an institution's public image, which in turn is likely to lead to increases in institutional spending,

The development of the Internet has been compared to the development of the printing press in terms of its potential effects on education. Similar - but obviously incorrect - claims have been made

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in the past for such innovations as movies, television and learning machines, but perhaps the Internet claim will prove to be true. The Internet provides access to virtually unlimited sources of information, permits the development of extremely creative curriculum materials which may include text or graphics, makes possible almost instant communication within a classroom or between classrooms or individuals anywhere in the world—Most important from an educational perspective—unlike previous technology innovations has the potential to be interactive.

As with any new technology, increased use of the Internet raises important questions, ranging from the sublime to the ridiculous. I will leave it to each reader to decide which label should be applied to each of these real-life examples. If a university tries to restrict access of its computers to sexually explicit sites on the Internet does this violate the academic freedom of faculty? Must students half-way around the world taking courses via the Internet satisfy legal requirements of a state law that all university students be vaccinated? Is it ethical for universities to sell advertising on their web pages to help pay for the costs of the technology? Can a university be sued for copyright infringement based on what a student might put on a World Wide Web page? Should students be able to buy copies of term papers or admissions essays over the Internet?

Many institutions are also trying to cope with some of the less obvious unintended consequences of Internet technology. For example, browsing the World Wide Web provides unprecedented opportunities to avoid serious academic work, leading in some cases to what has been called student "computer addiction" (DeLoughry, 1996), or to dropping out of school ("A study of dropouts...," 1996). The Web may eventually lead to as many wasted and unproductive hours in the U.S. as Pachinko in Japan, but may be even more distracting because it is playable while in school or at work.

Aside from the suggested educational benefits, these new technologies are believed by many to have the potential for major increases in institutional productivity. The visionaries talk about the financial benefits, as well as the improvement in quality, of having one great professor simultaneously teach classes in 50 locations, replacing 50 more expensive but less able professors. Whether the result can actually be thought of as "teaching" is problematic, but professors need not fear--at least not just yet. To my knowledge there is no evidence that these dual goals of lower cost and higher quality have been met, and there are significant questions about whether they can ever be met. Even those scholars who are strong advocates of the use of technology remain quite cautious. As two of the leading figures in the field have said,

> Will information technology lead to the kinds of productivity gains and associated cost savings touted by its most ardent advocates? Alas, not soon, we conclude, and certainly not

soon enough for the parties eager to control instructional costs or for the evangelists who promise that information technology will revolutionize learning (Green & Gilbert, 1995, p.8).

Why the reservations? Technology is expensive to buy and maintain, it is rapidly outdated and must be upgraded or replaced. Proper use requires extensive, expensive, and continuing commitments to faculty retraining and development. These costs must be taken from institutional budgets already strained by reduced state funding and public criticisms of increasing tuition. The significant costs involved may lead to even larger gaps in services between those institutions (and students) that can afford them and those that cannot. Black families, for example are only half as likely as white families to have computers at home (Floyd, 1996), and less wealthy institutions lag behind the wealthy ones in their use of technology. Harvard University's School of Business has just spent $11 million in equipment and a technical staff of 45 to bring technology to just one program (Mangan, 1996). Not many institutions can make similar investments. As of 1996, a third of all institutions using technology charged their students special fees to help to pay for additional hardware and software (DeLoughry, 1996; Young, 1997) further increasing student costs.

Technology has implications for how institutions offer programs on their campuses. But it has even greater implications for what it does outside the traditional campus in the process referred to as "distance learning."

Distance Learning

Distance learning has a long tradition in the U.S., beginning with correspondence courses offered through the mails, and more recently courses offered by television. With the development of the newer technology, offerings of non-resident college instruction has expanded exponentially. A 1993 guide to distance learning programs included 93 institutions. The 1997 edition of the same guide lists 762 accredited institutions that offer courses or entire degrees to "off-site students through the use of technologies such as cable or satellite television, video and audiotapes, fax, computer modem, computers and video conferencing and other means of electronic delivery" (Peterson's, 1996, p.vii). Fiscal conservatives rejoice in the increased competition that new technologies are presumed to bring to the market place, and see electronic distance learning as a way to cure traditional universities of their arrogance, faculty self-interest and unwillingness to reform (Gubernick & Ebeling, 1997). However, despite the growth of its use, thoughtful analysts still advise that "no form of distance education, or any other widely applicable educational use of information technology, has yet proved to be so much more effective and/or less expensive than 'traditional' forms of teaching and learning as to become a complete replacement for them" (Gilbert, 1996, p.12).

Despite these reservations, there are many good explanations for the expansion of distance education. It provides convenient educational opportunities for working adults, some of whom may be in remote locations at which no other programs are available. It lowers individual student costs by eliminating college living expenses (although tuition charges are often higher than they are for residential students). And there are non-educational incentives as well. For public institutions, distance learning programs can satisfy legislative concerns for meeting public needs. And for private enterprises, distance learning programs can make money. A great deal of money. They do this by reducing the number of faculty members required, by paying lower salaries to the faculty who remain, or both. This reduced reliance on faculty members is consistent with a general trend seen in U.S.higher education over the past decades.

The Vanishing Tenured Professor

In 1970, about 78% of all faculty in higher education were full-time. By 1993, only 60% were full-time (NCES, 1996). Some faculty work part-time by choice. But an increasing number do so because full-time positions are not available. Institutions are hiring more part-time faculty members because they are less expensive. Part-time salaries are lower, part-time faculty often get no personnel benefits, and they can be quickly hired or fired to meet enrollment changes. The increase in part-time faculty is a reflection of an increasingly market-driven and corporate view of higher education,

The trend towards the use of part-time faculty in the U.S. is complemented by an increasingly bitter battle over the principle and practice of tenure itself. Tenure in the U.S. is earned by faculty who are appointed to positions on the "tenure track" and who then successfully complete a six-year period of probationary contracts. Today, an increasing number of full-time faculty are being appointed to positions which are not eligible to earn tenure. But even initial appointment to a tenure-track position does not assure a faculty member of a permanent appointment. Not all eligible faculty receive tenure, and those that do must go through a number of intensive reviews and assessments by their faculty colleagues as well as by senior administrators.

Those who argue against tenure suggest that it limits institutional flexibility, protects incompetence, and establishes an unreasonable position of privilege not found in other social institutions. They believe that it discriminates against junior, untenured faculty, and that academic freedom can be protected even if tenure were abolished. Those who support tenure argue that is critical for academic freedom and the maintenance of a collegial and vibrant academic community. They criticize the increased use of part-time and non-tenure track faculty as leading to a hollowed-out institution, which looks more like a factory than a university, and employs exploited workers to teach the largest

number of students at the lowest cost.

Some faculty groups have been quick to see a connection between the growth of technology, the concept of distance learning, and the attack on tenure and the increase of part-time and non-tenure track faculty (Monaghan, 1996). The inevitable coalescence of these trends can be seen in the virtual university. The movement has been fostered by the interests of adult students, general public concerns about educational costs, and disagreement about what higher education is, or should be. I will describe two specific institutions in the U.S., one existing and one planned, which suggest two of the many different versions of the virtual university.

Two Virtual Universities

The existing institution, as described recently in the *Chronicle of Higher Education* (Strosnider, 1997) is the University of Phoenix, located in Arizona. This for-profit institution currently enrolls over 45,000 students in two year, four-year and masters degree programs. It is planning to offer a doctoral program. It offers classes at 64 different sites in ten states. It makes a profit of over $21 million a year. How can it make such a profit? It has only 45 full-time faculty members who are responsible for developing curriculum materials, which are then offered by 4,500 part-time adjunct faculty members. It pays these faculty members S2,000 for each course they teach. Like McDonald hamburgers, the University provides the same product at all its locations. It has no library. Adult students love it. As one of its graduates is reported to have said, he was able to get his degree in two years rather than the four years required in a more traditional institution. Moreover, as he pointed out, the course work at a traditional university might have been too abstract. "In a regular four year college" he said, "you deal with a lot of theory" (p.A33). Students at the University of Phoenix get a degree in a short period of time without having to worry about theories. What they learn probably provides personal satisfaction, improves their performance on the job, and may lead to promotions at work, all important benefits. Whether what they get is education is another matter.

The University of Phoenix is not exclusively based on technology, although it is moving in that direction. I call it a virtual university because even though its buildings are real, its curriculum is not. My second example is completely different. Western Governor's University, now in its planning stages, is a completely virtual institution. It is supported by the governors of 13 states in the western part of the U.S., and Guam (Blumenstyk. 1996), and has recently announced plans to collaborate with universities in Britain and Canada and with Suwan and Tokai Universities in Japan. The "University" will have no campus and no faculty. It will use video and the Internet to offer course materials developed by other institutions, and establish an assessment procedure to determine what

students have learned. The curriculum will be based on what employers want, and students will choose their courses from an extensive electronic catalog. Students will be assessed through competency examinations offered in geographically dispersed centers run by schools or businesses. Proposed as a cost-saving measure, the project will initially cost $25 million and is projected to make a profit after eight or nine years of operation ("Alaska and Guam...., 1997). The function of the University, according to its supporters, is to promote access. According to its critics, it is an attempt to buy cheap education and reduce state expenditures.

The purpose of the University of Phoenix is to make money and to satisfy the desires of ' students. The purpose of the Western Governor's University is to avoid expenditures for education, and to meet the needs of employers. Will the students get an education? Its advocates assert that they will. Other observers are not so sure. Assessing a student's knowledge after completing a course is one thing, but as one educator has said:

> the key is not what a person can do upon graduation, but rather what potential he or she has gained to respond to the unknown and changing circumstances....[A college degree] represents learning to see events in context and in perspective, the ability to formulate and consider options for future action, and comfort in dealing with new challenges.... The kind of virtual university envisioned by the Western governors seems likely to produce only virtual learning (Ashwortl, 1996. P.A88).

Technology and the University of the Future

Our experience in using the new technologies is quite recent and limited. The World Wide Web and graphic interfaces have only been available to educators for several years, and failed predictions in the past should make us cautious about premature predictions for the future. Still, it is instructive to consider quite different visions seen by two distinguished scholars who agree that the new technologies will be critical to the development of education, but who disagree on what their effects will be.

The first vision is offered by President Rudenstine of Harvard University (1997), an advocate of greater use of the Internet in education, who has said,

> The Internet has distinctive powers to complement, reinforce, and enhance some of the most effective approaches to university teaching and learning..... We must not undervalue the continued need for books and other tangible documents, or neglect the irreducible importance of sustained, face-to-face human contact in learning. But neither should we mistake what is happening for a mere fad or mirage, and fail to recognize the transformative possibilities of

the new technologies (p.A48).

The second, and quite different vision, is offered by Peter Drucker, a scholar well known in Japan, who has commented that

> Thirty years from now the big university campuses will be relics. Universities won't survive. It's as large a change as when we first got the printed book.... Totally uncontrollable expenditures, without any visible improvement in either the content or the quality of education, means that the system is rapidly becoming untenable. Higher education is in deep crisis.... Already we are beginning to deliver more lectures and classes off campus via satellite or two-way video at a fraction of the cost. The college won't survive as a residential institution. Today's buildings are hopelessly unsuited and totally unneeded (Lensner & Johnson, 1997, p.127).

Which vision is likely to be the most accurate? I suspect neither is. The Rudenstine vision is for maintaining the role of faculty and books, supplemented with the added value of the new technologies. It appears to be based on assumptions of a level of resources -- financial as well as intellectual -- that are unlikely to be available at all but a handful of extremely wealthy institutions. On the other hand, even the most fervent supporters of the Drucker vision must ultimately confront what history and human experience should have taught us about the survival of social institutions that serve important symbolic and cultural purposes.

As the anticipated productivity savings of the new technologies prove to be illusory, as I expect they will, the level of enthusiasm by those who view education as a primarily economic activity will fade as well. As Green and Gilbert (1995) explained recently, "we have yet to hear of an instance where the total costs (including all realistically amortized capital investments and development expenses, plus reasonable estimates for faculty and support staff time) associated with teaching some unit to some group of students actually decline while maintaining the quality of learning" (p.12).

I predict that the virtual university will grow, as the number of adults looking for retraining, credentials, stimulation, or convenience increases, and that it will provide an important service that will be in addition to, and not in place of, the more traditional university. The traditional university will not disappear, although it will continue to change in response to demography, technology, and political and economic circumstances. I hope that the development of virtual opportunities will not be used as an excuse to make traditional universities the "restricted preserve of those who can afford it" (Brown and Duguid, 1996, p.12), although I suspect that this will to some extent be true. I also hope that the existence of virtual programs will not be used to argue that there should be fewer full-time

faculty, or to attack the principle of tenure itself, although to some extent both of these have already begun.

The Value of the University

Some see the value of universities diminishing. I do not. Some see major closings of institutions. I do not. Some see less need to rely on the individualized attention provided by educated and committed faculty members. I do not. Perhaps I do not see them because I reject the logic on which the argument is based. Perhaps I do not see them because I do not want to see them.

Virtual institutions may serve a valuable purpose as a supplement to a traditional university, but they can never replace them. A university is not just a storehouse for facts or a producer of credentials for work. It is a place with a physical and social presence, an institution whose existence symbolizes the values of the culture that supports it and that represents the best of that culture. To be on a university campus is to experience the world in a different way. The virtual university provides the opportunity to learn at home, but a traditional university is a place whose value lies in part in being different from home, a place where students learn about independence, about life and about working with groups. It can, and should be, a distinctive place, not one which, like Western Governor's University, assembles standardized components without providing any value-added of its own. It can, and should be, a community of faculty members and students connected to each other by more than modems, not a service station in which isolated and disembodied individuals measure out units of teaching or units of learning. The reviewer of a recent book about technology has asked the important questions:

> Does the [Inter]Net turn us into nomads, people who have no need to be anyplace and therefore have no place? Are we in danger of becoming so distracted by the verbal and the virtual that we no longer participate in our real communities? Do the new technologies serve the digitally select in electronic cottages or do they isolate us from our colleagues, alienate us from fellow workers, tethering us to leaner and more productive corporations in digital sweatshops? Are we substituting neighbors, real people with faults and foibles in geophysical neighborhoods with e-mail buddies out there, on the web? Can the seduction of global techno-utopias make the tangible and relevant seem pedestrian? (Brady, 1997).

Technology can make vast amounts of information available to faculty and students alike, but the problems of higher education have never really been a lack of information. The problems are of a different nature: how can we create a just society, how can we enrich our lives and give them purpose, how can we encourage social involvement and connection, how can we make sense of all the

information we have. These questions are the same in Japan and the U.S.. In both countries they will not be answered electronically, but through student face-to-face participation in the faculty-mediated, interactive academic community of a university. John Mansfield wrote "there are few earthly things more splendid than a University.... Wherever a University stands, it stand and shines." No microchip can shine in quite the same way.

References

A study of dropouts at Alfred University has found that a large portion of them were heavy users of the Internet (1996, April 26). *Chronicle of Higher Education*, p.A21.

Alaska and Guam decide to join western state's virtual university (1997, May 2). *Chronicle of Higher Education*. P.A29.

Ashworth, K.H. (1996, September 6). Virtual universities could produce only virtual learning. *Chronicle of Higher Education*, p.A88.

Blumenstyk, G. (1996, June 14). Western states continue to plan 'virtual' college. *Chronicle of Higher Education*, P.A30-31.

Blumenstyk, G. (1997, January 31). Sudden satellite failure throws distance education into turmoil. *Chronicle of Higher Education*, p.A19.

Brady, S.M. (1997, Spring/Summer). [Review of the book *The Wired Neighborhood*] .*The Academic Workplace*, 8 (2), New England Resource Center for Higher Education, 11-12.

Brown, J.S. & Duguid, P. (1996, July/August) Universities in the digital age. *Change, 28 (4)*, ll-19.

DeLoughry, T.J. (1996, March 1). Snared by the Internet: College officials debate whether students spend too much time on line. *Chronicle of Higher Education*. P.A25, A27

DeLoughry, T.J. (1996, November 22). Campus computer use is increasing, but not as fast as in previous year. *Chronicle of Higher Education*, p. A21-22.

Floyd, B.P. (1996, December 20). Program in Afro-American studies explores racial gap in access to technology. *Chronicle of Higher Education*, P.A19-A20

Gilbert, S.W. (1996, March/April). Making the most of a slow revolution. *Change, 28 (2)*, p.10-23.

Green, K.C. & Gilbert, S.W. (1995, March/April). Great expectations: Content, communications, productivity, and the role of information technology in higher education. *Change, 27 (2)*, p.8-18.

Gubernick, L. & Ebeling, A. (1997, June 16). I got my degree through e-mail. *Forbes*, 84-92.

Lenzner, R.&Johnson, S.S (1997, March 10) Seeing things as they really are. *Forbes*, 122-128.

Mangan, K.S. (1996, November 15). High-tech tools help transform the way Harvard teaches business. *Chronicle of Higher Education*, p.A29, A31.

McCollum, K. (1997, April 25). Magazine rates colleges on how 'wired' they are; MIT comes out on top. *Chronicle of Higher Education*, p.A24.

Monaghan, P. (1996, March 15). Union leaders raise concern about technology, *Chronicle of Higher Education*. p.A26-A27.

National Center for Educational Statistics (1996). *Digest of educational statistics*. Washington, D.C.: U.S. Government Printing Office.

Petersons Distance Learning. 1997 (1996). Princeton, New Jersey: Petersons.

Rudenstine, N.L. (1997, February 21). The Internet and education: A close fit. *Chronicle of Higher Education* p.A48.

Strosnider, K. (1997, June 6). An aggresive, for-profit university challenges traditional colleges nationwide. *Chronicle of Higher Education*, A32-33.

Young, J.R. (1997, June 13). More college charges students a separate fee for technology. *Chronicle of Higher Education*, p.A23.

［要旨］

アメリカ高等教育における革新動向
－テクノロジーの利用とバーチャルユニバーシティ－

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　アメリカの高等教育では，あらゆる面で日常的に「革新」が起こっているが，特にテクノロジー利用は高等教育の革新に大きな影響を及ぼしている。

　本稿では，インターネット等のコンピュータ関連テクノロジー利用の増大状況を概観し，それが高等教育における生産性の向上につながるか，遠隔学習にどのような影響を与えるか，非常勤教員の増加や教員のテニュア問題とどのように関係しているかを論じ，またバーチャルユニバーシティ（仮想大学）の事例を検討し，大学の未来展望と大学の価値について根本的な問いを発している。