CHAPTER 5

The University and the Information Age

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Among the social and economic institutions to emerge over the past 900 years, few have survived as durably as colleges and universities. At least one explanation may be the ability of higher education institutions to adapt and change over the centuries. Certainly one need only look at the record of the last 100 years to document the magnitude of higher education's response to a rapidly changing society. Not just in the United States, but around the world, colleges and universities have adapted and changed while taking on new importance in the expanding information age. Globally, enrollments skyrocketed from 14 million in 1960 to some 82 million by 1995.

While it is almost certain that higher education institutions will continue to evolve in response to a rapidly changing and sometimes confusing world, the nature of the evolution, its speed, and its implications are far from clear. How higher education responds to the new information age and the complex communications capacity it brings with it may well shape the university in the next century.

Within this stark context, we hear such catchwords as "revolution," "paradigm shift," and "crisis," all of which may be accurate descriptions of the time in which we live. Knowledge is expanding; the capacity to generate, move, and respond to information is exploding; the workplace has become global; people are changing careers and roles more frequently; and, as a result, lifelong learning no longer is simply a desirable dream, it is an obvious imperative. For all these reasons, the premium placed on higher learning has grown dramatically.

Some have looked at this new world and predicted the demise of the university as we know it. Management guru Peter Drucker (1997) was recently quoted to that effect by *Forbes* magazine: "Thirty years from now, the big university campuses will be relics. Higher education is in deep crisis." Citing cost and access considerations, as well as the impact of new competitors and technological change, Drucker concluded that "universities won't survive."

Most of us have learned to take Peter Drucker seriously and to take notice when he speaks. Drucker may be right, but all my instincts, and the record of the last 900 years, tell me (to draw on Mark Twain) that the reports of our imminent demise are greatly exaggerated. Still, whether it is revolution or evolution, whether it is adaptation or demise, the forces are new—perhaps as significant as the invention of the printing press—and they are moving swiftly, with unprecedented consequences to be felt throughout the world.

One need only examine the worlds of commerce, entertainment, and global politics. Every day we witness the speed and power of communications technology and the expanded capacity to send, receive, and use information. More to the point, low-cost, high-power computing; communication networks; the Internet; Internet2; and countless other forms of electronic, digital, and telecommunications technologies literally are changing the way the world runs.

The *pace* of change is as remarkable as its consequence. In 1993, the Mosaic web browser was created at the University of Illinois and later incorporated into Netscape Navigator and Microsoft Internet Explorer. Now, millions of people have access to the web through these and other means. And all in only five years! But what about the next five years? We now have Abilene, the new Internet2 Protocol network, which will provide expanded capacity for such new applications as virtual laboratories, digital libraries, distance-independent education, and advanced networking.

Yet, focusing on the Internet alone obscures the reality and the vast impact of new computing and telecommunications technologies that range far beyond the net. In virtually every sector of our global society, the speed and power of communications technologies continue to grow. And the cost, at least in terms of speed and power per dollar, continues to drop.

The impact of this new technology has come more quickly and been more obvious in sectors other than higher education. Over the last decade, we have seen a virtual transformation in the world of finance. The continuing rush of bank mergers is made both possible and essential because of the new technology. The volatility of the world financial markets—driving currency values up and down and sending shock waves throughout equity markets—is attributable, at least in large part, to the power of communications technology. Businesses and corporations have reengineered their processes, in part be-

cause the new technology permits it, and in part because businesses require the new technology to remain globally competitive. And, we have seen transformations in the worlds of politics, entertainment, and journalism as well.

Change in higher education is coming more slowly, but it is coming all the same. And the consequences may be no less significant. One might even suppose that because colleges and universities are, in a sense, the ultimate "information age" institutions, the eventual impact of the new communications technology will be even greater in the academic sector than it is in others.

What is at issue? What is it about this new technologically driven information/communication age that is fundamentally different for the university? Some would answer, "very little." The life of the mind remains unchanged. The challenge, they would stress, is to comprehend, to analyze, to create, and to understand. The mission is to push back the frontiers of knowledge. All of that, it would seem, will remain the same.

The change, however, lies in the way information is moved, manipulated, and managed, and the ease with which access has been expanded. Already it is clear that new technology has caused colleges and universities to change the way teaching, research, and public service are carried out. Institutions are at different stages and are following different strategies with regard to technological infusion. In most instances, however, the revolution proceeds without any clear vision or master plan and many times is led by faculty and students who elect to change in response to new technological possibilities.

Whatever the plan (or lack thereof), on most campuses, access to the new computing/information technology is being made available, one way or another, to all members of the academic community. The way information is stored and shared is changing in classes and case studies, in accounting and enrollment systems, in university libraries and data banks. And along with all this has come a change in how colleges and universities allocate their resources, with increasing investment now devoted to acquiring technology, training individuals to use it, and hiring individuals to operate and maintain it.

COLLABORATION

While we see these technology-driven changes taking place, it is difficult to foresee their long-range implications. One already obvious consequence, for example, is a welcome increase in the capacity for collaboration. With the barriers of distance and time now less important, and with the cost of sharing information reduced, collaboration among scholars in different departments, with different work styles, and in different parts of the world has become easier. My son David, for example, on the faculty at Rice University in Texas,

collaborates easily with his colleagues in Illinois, Paris, Hong Kong, and elsewhere.

Institutions are able to collaborate more easily as well. Administrative functions within and among institutions, for example, can be combined to increase efficiency and reduce costs. A single accounting department, purchasing department, or information center can serve multiple audiences and campuses in several locations. Library resources can be shared more conveniently.

So, for both individuals and institutions, as we worry about technology reducing our sense of community—our interrelatedness—there is also the possibility that technology will expand our sense of community and interdependence.

UNBUNDLING

A less obvious but ultimately more powerful consequence of the new technology is the opportunity it presents for "unbundling" learning objectives and desired outcomes. Over the centuries, the several functions served by higher education institutions have been accomplished together—teaching, research, and service are the most obvious of these.

Even within the teaching/learning mission, much of the "bundle" is not apparent. As part of a total learning experience, for example, residential campuses provide an environment in which young people grow and mature, a place where one can "find" oneself. Campuses offer a setting where values are taught and caught; where lifestyles are explored and formed; and where social, political, and economic beliefs are shaped, sometimes deliberately, but more often as part of a larger, quasi-random whole we call the campus community. At its best, a college or university enables students to "know," to "do," to "live and work" with others. Ultimately, higher education should enable its students to function effectively as complete human beings. This broader "bundled" view of learning—one that joins knowledge acquisition and skill development with personal growth and development—is what we think and speak of as the "purpose" of a college education.

To say that new communications technology permits the unbundling of these functions is, of course, true. But it does more than that. The new technology *invites* unbundling, partly because of economic incentives and realities, partly because of the needs and desires of those who are served, and partly because of the limits of the technology itself. As a result, teaching, or the sharing of knowledge and skills, tends to be unbundled from the creation of knowledge, or research. Likewise, information transmission tends to be separate from analysis and synthesis. As in health care, if it is possible to separate and recast the basic academic functions by using technology, what will this likely mean for colleges and universities a generation from now?

NEW PROVIDERS

The advent of new technology and the ability to minimize the barriers of time and distance, coupled with the surge in demand for learning in the new information age, have stimulated the emergence of new learning providers. To borrow a concept from the corporate world, the "barriers to entry" have diminished. One need not invest vast sums in bricks and mortar. One need not necessarily build an accomplished faculty or a vast library. Significant investments are still required, but they are of a different kind.

As a result, we are seeing a steady stream of new providers (and, therefore, new competitors) enter the higher education market. They include for-profit institutions, such as the University of Phoenix; new coalitions, such as the Western Governors University; and corporate universities, creatures of the business world.

The University of Phoenix is part of a publicly held, for-profit corporation, founded about two decades ago for the express purpose of serving working professionals, rather than the traditional, in-residence college student. Phoenix has unbundled the higher education market and has chosen to focus primarily on fully employed adults. Its current enrollment stands at more than 60,000, with numerous delivery sites around the country (and globally) along with online learning capacity. Accredited by the Middle States Regional Accrediting Association, the University of Phoenix admits only students who are 23 years of age or older and who are fully employed. In most cases, the student's employer pays for tuition, reflecting a closer link between learning and work.

The Western Governors University, or WGU, is a more recent creation, the brainchild of Utah Governor Mike Leavitt and Colorado Governor Roy Romer, who together worked to build consensus among the leaders of 16 Western states and Guam to create a new "cyber-university." WGU hopes to act in three capacities: as an electronic broker of distance-learning services on behalf of established colleges and universities within the region; as a vehicle for delivering training on behalf of corporations; and as a separate institution that itself will award degrees based on "competency assessment," rather than on the traditional, on-campus course credit and examination systems. In many ways, WGU is a broker, a new learning coalition driven by government.

Corporate universities have been around for many years, but the last decade has seen a dramatic surge of these new entities. Although no reliable statistics are available, it is possible that U.S. corporations now spend more money on education and serve more learners than traditional higher education institutions. Motorola, for example, reportedly spends some $120–$150 million annually. Arthur Anderson spends over 5 percent of its revenues on

education and training. The typical corporation with a corporate university may spend 2 percent or more of its total revenue on this function.

The last decade has seen the number of corporate universities grow from some 400 to more than 1,000. For some corporations, the creation of a "university" is little more than a new name for an old function. For others, it is a recognition of the pace of change in knowledge. In still others, it reflects the requirements of global expansion and the need for common standards of performance and quality control.

Unlike traditional universities, these new creatures are not concerned with campuses, credits, degrees, or accreditation. And, like WGU and the University of Phoenix, the corporate university relies heavily on new technology as the education delivery vehicle of choice. The goal, whenever possible, is to deliver access to learning to the employee's desk or workstation.

Increasingly, students (and faculty) move back and forth between the corporate and academic worlds. The exchange between the two sectors is sufficiently significant that the American Council on Education offers a service called "ACE credit," which assesses corporate "courses" for potential transfer of credits to traditional colleges and universities.

QUESTIONS OF QUALITY

All of this, of course, immediately raises questions of "quality." In a world in which providers of information are ubiquitous, who (and what) is credible? When the information provider is a stable institution, with a faculty, a library, and a century-long reputation, the challenge of assessing quality is quite different from that of assessing the quality of a new-age, cyberspace learning provider. When learning is unbundled, how does one distinguish between the quality of data, information, knowledge, and wisdom, and the more important, long-range consequences of education about which we should care most? And, more interesting, to whom does it matter? Will we move to "accredit" learning products and systems rather than institutions and programs?

At this juncture, we have more questions than answers. For some, the new world of technology, including the advent of new competitors, offers excitement, answers long awaited, and opportunities to be exploited. Others greet the new era, if not with sadness, then with trepidation and a fear that the essence of what we know and value as higher education may be threatened. For most, the reaction is a cautious combination of both.

COMMERCIALIZATION OF LEARNING

New technology is obviously expanding access to information and learning. Within this environment, the economics of higher education are shifting.

Learning providers, for example, are likely to require a much larger scale of distribution for newly developed learning systems and products to make the initial investment in the new technology economically feasible. New corporations and new coalitions are almost certain to develop to create the capital necessary to exploit the new technology. And, correspondingly, new distribution coalitions and networks designed to capture the investment are likely to emerge.

Some see the prospect of an increasing "commercialization" of learning as a likely outcome of the new era. Existing higher education institutions, public and private, may not be structured in optimal ways for this new order. Individual faculty members working in isolated disciplinary departments in separate universities—the basic organizing units of the academic world as we now know it—are not the obvious building blocks in the new era. We may instead see teams of scholars, media specialists, system designers, and mass marketers, all with a capacity to take larger risks and move more quickly than has been possible within the traditional academic culture. Moreover, once "place" becomes less important in the new world of electronic communications and learning, the rationale for investment in higher education by state governments may change. In short, wholly new institutional forms and systems of financing may emerge, funded by private capital rather than by government.

QUESTIONS OF COST

One unfulfilled promise of the new technology has been that of cheaper if not better delivery of higher education. This potential advantage has not been lost on government; policymakers weigh the various priorities for public funds and look longingly at a new technology that might provide a quick fix to meeting the expanded demand for higher learning. In the first years of the twenty-first century, for example, the number of traditional college-age individuals is expected to rise, especially in the West, the Southwest, and the South. Some politicians and planners, including the Western Governors Association, look to the new technology to meet the demand for expanded access without the costs associated with a comparable expansion of the traditional delivery systems.

So far, however, the economic reality has fallen short of the dream. To date, application of technology in colleges and universities has tended to *add* to cost pressures, not relieve them. And yet, it is possible that over the long term substantial savings may be possible as we learn not just to add technology to an existing system of instruction, but to redesign the system itself, adding entirely new global delivery systems that reach vastly larger audiences. Only time will tell.

What all this means for institutions is less than clear. The impact and response may vary from campus to campus. Some small liberal arts colleges, for example, may be threatened by the new competitors, and others may find new life. If portions of the academic "content" were delivered via technology and available to the small liberal arts college, for example, and if faculty were to assume the roles of learning coaches, planners, and counselors, the new technology might give the liberal arts college a special competitive advantage. Such a campus could focus more on the development of the student as a person, and less on mere information transmission. For all institutions, the role of the library could take on a different meaning and be assessed in different ways if information resources were expanded to include global networks.

TRANSFORMATION?

What is the magnitude of change that confronts colleges and universities? The potential reach of the new technology seems almost without limits. Whatever the ultimate impact, technology has already changed higher education institutions—the way we organize ourselves, our policies, our culture, what faculty do, the way we work, and those we serve. And this transformation will continue well into the next century.

The big unknown is "place." Presently, while the academic world is changing, American higher education is still organized around the assumption that teaching and learning will occur in a defined place, through a direct personal exchange between scholar and student. The individual faculty member is the primary unit of investment, the principal means of delivery, and the main guarantor of academic quality. These fundamental assumptions are being challenged, and the traditional academic culture is likely to be the main object of transformation.

If higher education is to prove Drucker wrong, we must invent ways to capitalize on our strengths but alter our structure, our culture, and our methods of teaching and learning. We will be forced to define anew what we mean by "education." What learning do we hope to achieve? How will quality be assessed and judged? And, in the end, how will this new world be valued by the larger society? Institutions are almost certain to respond differently. Some will change dramatically, some only incrementally. The end result is likely to be a continuing increase in the diversity of higher education opportunities and options.

In time, we may learn that what appeared to loom so large at the end of the twentieth century will turn out to be but one more morsel that will be assimilated and digested by higher education with only modest lasting change. And yet, it may also be that we are in the early years of a sea change that will forever alter the history of colleges and universities and their relationship to society.