

# The 21st Century University:

## A Tale of Two Futures

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*It was the best of times, it was the worst of times,  
 It was the age of wisdom, it was the age of foolishness,  
 It was the epoch of belief, it was the epoch of incredulity,  
 It was the season of Light, it was the season of Darkness,  
 It was the spring of hope, it was the winter of despair,*

Charles Dickens  
*A Tale of Two Cities*

To paraphrase Dickens, these do indeed seem like both the best of times and the worst of times for higher education in America. On the one hand, in an age of knowledge, in which educated people and their ideas have become the wealth of nations, the university has never been more important, and the value of a college education never higher. The educational opportunities offered by the university, the knowledge it creates, and the services it provides are key to almost every priority of contemporary society, from economic competitiveness to national security to protecting the environment to enriching our culture. There is a growing recognition that few public investments have higher economic payoff than those made in higher education. In 1997 the federal government made the largest commitment to higher education since the GI Bill through \$40 billion of tax incentives to college students and their parents as part of the budget balancing agreement. In 1998 Washington took further action by proposing the largest increase in the funding of academic research in decades (the Research Fund For America). And both the administration and Congress promises balanced budgets and generous support for years to come.

Yet, there is also great unease on our campuses. The media continues to view the academy with a frustrating mix of skepticism, ignorance, and occasional hostility that erodes public trust and confidence. Although an unusually prosperous economy has provided both state and federal governments with the resources to halt the erosion in public support of higher education, the danger of intervention in the name of accountability remains high. Throughout society we see a backlash against earlier social commitments such as affirmative action, long a key mechanism both for diversifying our campuses and providing educational opportunity to those suffering discrimination in broader society. And the faculty feels the stresses from all quarters, fearing that research funding will decline again when the economy cools, sensing a loss of scholarly community with increasing specialization, and torn between the demands of grantsmanship, a reward structure emphasizing research, and a love and sense of responsibility for teaching.

To continue with Dickens, while we may be entering an age of wisdom—or at least knowledge—it is also an age of foolishness. Several years ago, the noted

futurist Peter Druckers shook up the academy when, during an interview in *Forbes*, he speculated: “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.”<sup>1</sup> One can imagine the network of interactions that ricocheted across university campuses in the months following Drucker's conjecture. It was fascinating to track the conversations among the University of Michigan deans on electronic mail. Some, of course, responded by blasting Drucker, always a dangerous thing to do. Others were simply moot. A few even surmised that perhaps a former president of the University of Michigan might agree with Drucker. (He doesn't, incidentally.)

So what are we facing? A season of light or a season of darkness? A spring of hope or a winter of despair? More to the point, and again in a Dickensian spirit, is higher education facing yet another period of evolution? Or will the dramatic nature and compressed time scales characterizing the changes of our time trigger a process more akin to revolution?

To be sure, most colleges and universities are responding to the challenges and opportunities presented by a changing world. They are evolving to serve a new age. But most are evolving within the traditional paradigm, according to the time-honored processes of considered reflection and consensus that have long characterized the academy. Is such glacial change responsive enough to allow the university to control its own destiny? Or will the tidal wave of societal forces sweep over the academy, both transforming the university in unforeseen and unacceptable ways while creating new institutional forms to challenge both our experience and our concept of the university?

In this paper, we will discuss two sharply contrasting futures for higher education in America. The first is a rather dark, market-driven future in which strong market forces drive a major restructuring of the higher education enterprise. Although traditional colleges and universities play a role in this future, they are both threatened and reshaped by aggressive for-profit entities and commercial forces that drive the system toward the mediocrity that has characterized other mass media markets such as television and journalism.

A contrasting and far brighter future is provided by a culture of learning, in which universal or ubiquitous educational opportunities are provided to meet the broad and growing learning needs of our society. Using a mix of old and new forms, learners are offered a rich array of affordable learning opportunities of high quality. Our traditional institutional forms, including both the liberal arts college and the research university, continue to play key roles, albeit with some necessary evolution and adaptation.

Although market forces are far more powerful than most realize, we also believe that it is possible to determine which of these or other paths is taken by higher education in America. Key in this effort is our ability as a society to view higher education as, in part, a public good that merits support through public tax dollars. In this way, we may be able to protect the public purpose of the higher education enterprise and sustain its quality, important traditions, and essential values.

Yet, if we are to do this, we must also recognize the profound nature of the rapidly changing world faced by higher education. The status quo is no longer an option. We must accept that change is inevitable and use it as a strategic opportunity to control our destiny, retaining the most important of our values and our traditions.

## The Age of Knowledge

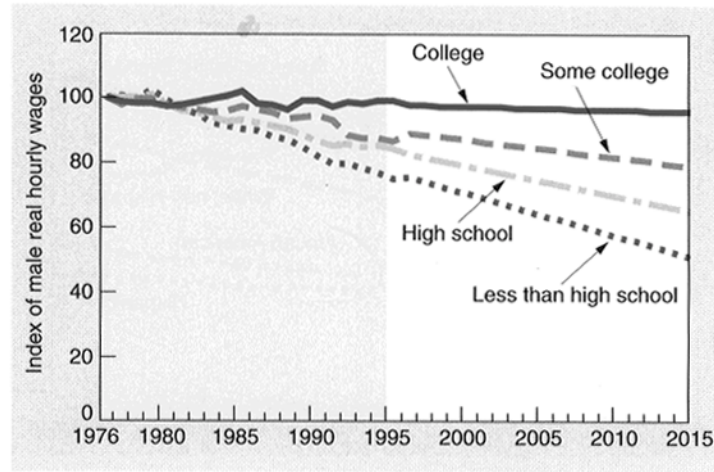
There are powerful forces driving an increasing societal demand for higher education services in the United States. In today's world, knowledge has become the coin of the realm, determining the wealth of nations. It has also become the key to one's personal standard of living, the quality of one's life.

We are in a transition period where intellectual capital, brain power, is replacing financial and physical capital as the key to our strength, prosperity, and well-being. In a very real sense, we are entering a new age, an *Age of Knowledge*, in which the key strategic resource necessary for prosperity has become knowledge itself, that is, educated people and their ideas. Our society is becoming ever more knowledge-intensive.

We have entered an era when the need for, and the demand for, advanced education and learning opportunities will grow rapidly. Increasingly, the education and skills of individuals are seen as the key to both their personal quality of life and the broader strengths of their society. Today, over 65 percent of the new jobs created require a college degree. Furthermore, the need for continuing education of the existing workforce has created a rapidly growing market for adult education at the college level.

People have always looked to education as the key to prosperity and social mobility. But now more than ever, people see education as their hope for leading meaningful and fulfilling lives. The level of one's education has become a primary determinant of one's economic well-being. Just as a high school diploma became the passport for participation in the Industrial Age, today, a century later, a college education has become the requirement for economic security in the Age of Knowledge.

The implications of the knowledge-intensive nature of our society can be seen by comparing the wages of groups with differing education levels:



The single most important factor in determining the level of income has become the level of one's education. And it is disturbing how dramatically the incomes diverge; the income of those without a college education may drop 30 percent to 40 percent over the next twenty years. Clearly, this growing gap between the haves and have-nots poses a great threat to our nation's social order, a threat which can only be addressed through education.

A college education will serve only as a stepping stone to a process of lifelong education. The ability to continue to learn and to adapt to—indeed, to manage—change and uncertainty will become among the most valuable skills of all. For example, an active working career of sixty years might require ten or more complete relearning cycles through a lifetime.

In this age of knowledge, our society is becoming ever more dependent upon those social institutions that create knowledge, that educate people, and that provide them with knowledge and learning resources throughout their lives—institutions such as our colleges and universities. Yet here there is growing concern about whether our existing institutions have the capacity to serve these changing and growing social needs—indeed, even whether they will be able to survive in the face of the extraordinary changes occurring in our world.

## The Forces Driving Change

It is useful to summarize those forces of change of most direct concern to higher education. They can be grouped into three areas: i) financial imperatives, ii) social needs, and iii) technology drivers.

## Financial Imperatives

Since the late 1970s, higher education in America has been caught in a financial vise.<sup>2</sup> On the one hand, the magnitude of the services demanded of our colleges and universities has increased considerably. Enrollments have grown steadily; the growing educational needs of adult learners have compensated for the temporary dip in the number of high school graduates associated with the post-war baby boom/bust cycle. University research, graduate education, and professional education have all grown in response to societal demand. Professional services provided by colleges and universities also continue to grow in areas such as health care, technology transfer, and extension—all in response to growing needs.

The costs of providing education, research, and service per unit of activity have grown at an even faster rate, since these university activities are dependent upon a highly skilled, professional workforce (faculty and staff); they require expensive new facilities and equipment; and they are driven by an ever-expanding knowledge base. Higher education has yet to take the bold steps to constrain cost increases which have been required in other sectors of our society such as business and industry. This is in part because of the way our colleges and universities are organized, managed, and governed. But, even if our universities should acquire both the capacity and the determination to restructure costs more radically, it is debatable whether those industrial sector actions designed to contain cost and enhance productivity could have the same impact in education. The current paradigm of higher education is simply too people- and knowledge-intensive.

As the demand for educational services has grown and the operating costs to provide these services have risen, public support for higher education has flattened and then declined over the past two decades.<sup>3</sup> The growth in state support of public higher education peaked in the 1980s and now has fallen in many states in the face of limited tax resources and the competition of other priorities such as entitlement programs and corrections. While the federal government has sustained its support of research, growth has been modest in recent years and is likely to decline as discretionary domestic spending comes under increasing pressure from federal budget-balancing efforts. There has been significant downsizing in federal financial aid programs over the past two decades, with a corresponding shift from grants to loans as the predominant form of aid. While the new federal budget agreement is good news to middle-class parents, it is unlikely to bring new resources to higher education.

To meet growing societal demand for higher education at a time when costs are increasing and public support is declining, most institutions have been forced to sharply increase tuition and fees—substantially faster than the Consumer Price Index. While this has provided short-term relief, it has also triggered a strong public concern about the costs and availability of a college education, along with accelerating forces to constrain or reduce tuition levels at both public and private universities.<sup>4</sup> As a result, most colleges and universities are now looking for ways to control costs and increase productivity, but most are also finding that their current organization and governance makes this very difficult.

The higher education enterprise in America must change dramatically if it is to restore a balance between the costs and availability of educational services needed by our society and the resources available to support these services.

*The current paradigms for conducting, distributing, and financing higher education may not be able to adapt to the demands and realities of our times.*

### Societal Needs

The needs of our society for the services provided by our colleges and universities will continue to grow. Significant expansion will be necessary just to respond to the needs of a growing population which will create a 30 percent growth in the number of college-age students over the next decade. But these traditional students are only part of the picture; we must recognize the impact of the changing nature of the educational services sought by our society.

Today's undergraduate student body is no longer dominated by eighteen to twenty-two year-old high school graduates from affluent backgrounds. It is comprised also of increasing numbers of adults from diverse socio-economic backgrounds, already in the workplace, perhaps with families, seeking the education and skills necessary for their careers. When it is recognized that this demand for higher education may be significantly larger than that for traditional undergraduate education, it seems clear that either existing institutions will have to change significantly or new types of institutions will have to be formed. The transition from student to learner, from faculty-centered to learner-centered institutions, from teaching to the design and management of learning experiences, and from student to a lifelong member of a learning community—all suggest great changes are ahead for our institutions.

The students entering college today require a different form of education in which interactive and collaborative learning will increasingly replace the passive lecture and classroom experience. The student has become a more demanding



consumer of educational services, although frequently this is directed at obtaining the skills needed for more immediate career goals.

We are beginning to see a shift in demand from the current style of “just-in-case” education in which we expect students to complete degree programs at the undergraduate or professional level long before they actually need the knowledge, to “just-in-time” education in which education is sought when a person needs it through non-degree programs, to “just-for-you” education in which educational programs are carefully tailored to meet the specific lifelong learning requirements of particular students. So too the shift from synchronous, classroom-based instruction to asynchronous computer network-based learning, to the provision of ubiquitous/pervasive learning opportunities throughout our society will demand major change.

The needs for other higher education services also are also changing dramatically. The relationship between the federal government and the research university is shifting from a partnership in which the government is primarily a patron of discovery-oriented research to a process of procurement of research aimed at addressing specific national priorities. The academic medical center has come under great financial pressure as it has been forced to deal with a highly competitive health-care marketplace and the entry of new paradigms such as managed care. While the public appetite for the entertainment provided by intercollegiate athletics continues to grow, our colleges also feel increasing pressures to align these activities better with academic priorities and national imperatives (such as the Title IX requirements for gender equity).

Even as the nature of traditional activities in education, research, and service change, society is seeking new services from higher education, e.g., revitalizing K-12 education, securing economic competitiveness, providing models for multicultural societies, rebuilding our cities and national infrastructure. All of this is occurring at a time when public criticism of higher education is high, and trust and confidence in the university is relatively low.

The inability of our existing institutions to meet the growing need for higher education is magnified many times throughout the world. Just consider for a moment that over half of the world’s population is under twenty years of age. In fact, by the year 2000, there will be over two billion teenagers in the world, seeking education as the key to their future quality of life. To meet this staggering demand, a major new university would need to be created every week.

In most of the world, higher education is mired in a crisis of access, cost, and flexibility. Unless we can address and solve this crisis, billions of people in

coming generations will be denied the education so necessary to compete in—indeed, to survive in—an age of knowledge.

Sir John Daniels, Chancellor of the Open University of the United Kingdom, observes that although the United States has the world's strongest university system this seems ill-suited to guiding us out of this global education crisis. Our colleges and universities continue to be focused on high-cost, residential education and to the outmoded idea that quality in education is linked to exclusivity of access and extravagance of resources. In fact, the American concept of the campus university would deny higher education to nearly all of the billions of young people who will require it in the decades ahead.

*Again there are many signs that the current paradigms are no longer adequate for meeting growing and changing societal needs.*

### Technology Drivers

As knowledge-driven organizations, colleges and universities are greatly affected by the rapid advances in information technology—computers, telecommunications, networks. This technology has already had dramatic impact on campus research activities, including the creation of an entirely new form of research: computer simulation of complex phenomena. Many of our administrative processes have become heavily dependent upon information technology—as the current concern with the approaching date reset of Year 2000 has made all too apparent. There is an increasing sense that new technology will have an even more profound impact on the educational activities of the university and how we deliver our services. To be sure, there have been earlier technology changes such as television, but never before has there been such a rapid and sustained period of technological change with such broad social applications.

Most significant here is the way in which emerging information technology has removed the constraints of space and time. We can now use powerful computers and networks to deliver educational services to anyone at any place and any time, confined no longer to the campus or the academic schedule. The market for university services is expanding rapidly, but so is competition, as new organizations such as virtual universities and "learning-ware" providers enter this marketplace to compete with traditional institutions.

*Again, we must face the possibility that the current paradigm of the university may not be capable of responding to the opportunities or the challenges of the new knowledge media or the needs of the digital generation.*

## The University as a Knowledge Server

To illustrate the profound nature of these forces on higher education, consider the impact of emerging knowledge media on the activities of the university. One frequently hears the primary missions of the university referred to in terms of teaching, research, and service. But these roles can also be regarded as simply the 20th-Century manifestations of the more fundamental roles of *creating*, *preserving*, *integrating*, *transmitting*, and *applying* knowledge. If we were to adopt the more contemporary language of computer networks, the university might be regarded as a “knowledge server,” providing knowledge services (i.e., creating, preserving, transmitting, or applying knowledge) in whatever form needed by contemporary society.

From this more abstract viewpoint, it is clear that while the fundamental knowledge server roles of the university do not change over time, the particular realization of these roles do change—and change quite dramatically. Consider the role of “teaching,” that is, transmitting knowledge. We generally think of this role in terms of a classroom paradigm, that is, of a professor teaching a class of students, who in turn respond by reading assigned texts, writing papers, solving problems or performing experiments, and taking examinations. Yet, the classroom itself may soon be replaced by learning experiences enabled by emerging information technology. Indeed, such a paradigm shift may be forced upon the faculty by the students themselves.

Today's students are members of the “digital generation.” They have spent their early lives surrounded by robust, visual, electronic media—*Sesame Street*, MTV, home computers, video games, cyberspace networks, MUDs, MOOs, and virtual reality. Unlike those of us who were raised in an era of passive, broadcast media such as radio and television, they expect, indeed demand, interaction. They approach learning as a “plug-and-play” experience, unaccustomed and unwilling to learn sequentially—to read the manual—and inclined to plunge in and learn through participation and experimentation. While this type of learning is far different from the sequential, pyramid approach of the traditional university curriculum, it may be far more effective for this generation, particularly when provided through a media-rich environment.

Just watch how young people surf through the Net for information. They launch search engines, scour Gopher and FTP sites, interact through MOOs and Usenet groups, both following existing links and launching new ones. In a very real sense, they are on a serious journey of learning, building elaborate information networks. It is a highly interactive and collaborative process. This is the way they learn.

There is even research that suggests that there may be a physiological difference between the brains of the “digital generation” and those of us from 20th Century generations.<sup>5</sup> It has been known that early exposure of infants and young children to various stimulation can actually affect their neurological development—the evolution of their neural networks. Children raised in a media-rich, interactive environment tend to think and learn differently because they are physiologically different from us. Our styles of learning are not theirs.

It could well be that faculty members of the 21st Century university will find it necessary to set aside their roles as teachers and instead become designers of learning experiences, processes, and environments. Tomorrow's faculty may have to discard the present style of solitary learning experiences, in which students tend to learn primarily on their own through reading, writing, and problem solving. Instead, they may be asked to develop collective learning experiences in which students work together and learn together, with the faculty member becoming more of a consultant or a coach than a teacher. Faculty members will be less concerned with identifying and then transmitting intellectual content and more focused on inspiring, motivating, and managing an active learning process by students. We should note that this will require a major change in graduate education, since few of today's faculty members have learned these skills.

The intellectual structure of the learning process will become increasingly nonlinear, allowing far more student control over the learning experience. The hyperlearning model proposed by Perelman may be more typical of the learning paradigms of the future than today's classroom-based curriculum in which students move along together in lockstep. In Perelman's model, learning consists of a number of learning modules or stations.<sup>6</sup> Students employ the modules of their choice until a certain level of competency is achieved.

One can easily identify similarly profound changes occurring in the other roles of the university. The process of creating new knowledge—research and scholarship—is also evolving rapidly away from the solitary scholar to teams of scholars, perhaps spread over a number of disciplines. There is increasing pressure to draw research topics directly from worldly experience rather than predominantly from the curiosity of scholars. Even the nature of knowledge creation is shifting somewhat away from the *analysis of what has been* to the *creation of what has never been*—drawing more on the experience of the artist than upon analytical skills of the scientist.

The preservation of knowledge is one of the most rapidly changing functions of the university. The computer—or more precisely, the “digital convergence” of various media from print-to-graphics-to-sound-to-sensory experiences through

virtual reality—has already moved beyond the printing press in its impact on knowledge. Throughout the centuries, the intellectual focal point of the university has been its library, its collection of written works preserving the knowledge of civilization. Today such knowledge exists in many forms—as text, graphics, sound, algorithms, and virtual reality simulations—and it exists almost literally in the ether, distributed in digital representations over worldwide networks, accessible by anyone and certainly not the prerogative of the privileged few in academe. The role of the library is becoming less that of collecting and more that of a knowledge navigator, a facilitator of retrieval and dissemination.<sup>7</sup> In a sense, the library and the book are merging. One of the most profound changes will involve the evolution of software agents, collecting, organizing, relating, and summarizing on behalf of their human authors.

It is also clear that societal needs will continue to dictate great changes in the applications of knowledge it expects from universities. Over the past several decades, universities have been asked to lead in applying knowledge across a wide array of activities, from providing health-care to protecting the environment, from rebuilding our cities to entertaining the public at large (although it is sometimes hard to understand how intercollegiate athletics represents knowledge application). In the years ahead higher education will be challenged to address our ever-changing social priorities, e.g., economic competitiveness, K-12 education, and global change.

This abstract definition of the roles of the university has existed throughout the long history of the university and will certainly continue to exist as long as these remarkable social institutions survive. But the particular realization of the fundamental roles of knowledge creation, preservation, integration, transmission, and application will continue to change in profound ways, as they have so often in the past. The challenge of change, of transformation, is necessary simply to sustain our traditional roles in society.

Although the digital age will provide a wealth of opportunities for the future, we must take great care not simply to extrapolate the past, but instead to examine the full range of possibilities for the future. It could well be that our present institutions, such as universities and government agencies, which have been the traditional structures for intellectual pursuits, may turn out to be as obsolete and irrelevant to our future as the American corporation of the 1950s. There is clearly a need to explore new social structures that are capable of sensing and understanding the change and of engaging in the strategic processes necessary to adapt or control it.

Since the business of the university is knowledge—its creation, preservation, transmission, and application—the impact that the extraordinary advances in

information technology could have—likely will have—profound implications for universities. Rapidly evolving technologies are dramatically changing the way we collect, manipulate, and transmit information. This directly challenges the traditional paradigms of the university, where processes of knowledge creation, preservation, transmission, and application are still largely based on books, chalk boards, oral lectures, and static images.

In the last three decades, computers have evolved into powerful information systems with high-speed connectivity to other systems throughout the world. Public and private networks permit voice, image, and data to be made instantaneously available across the world to wide audiences at low costs. The creation of virtual environments where human senses are exposed to artificially created sights, sounds, and feelings liberate us from restrictions set by the physical forces of the world in which we live. Close, empathic, multi-party relationships mediated by visual and aural digital communications systems are becoming common. They lead to the formation of closely bonded, widely dispersed communities of people interested in sharing new experiences and intellectual pursuits created within the human mind via sensory stimuli. Computer-based learning systems are also being explored, opening the way to new modes of instruction and learning. New models of libraries are being explored to exploit the ability to access vast amounts of digital data in physically dispersed computer systems, which can be remotely accessed by users over information networks.

New forms of knowledge accumulation are evolving: written text, dynamic images, voices, and instructions on how to create new sensory environments can be packaged in dynamic modes of communication never before possible. The applications of such new knowledge forms challenge the creativity and intent of authors, teachers, and students. Technology such as computers, networks, HDTV, ubiquitous computing, knowbots, and other technologies may well invalidate most of the current assumptions and thinking about the future nature of the university.

Perhaps we should pay more attention to developing new learning structures more appropriate for the evolving information technology. One example would be the "collaboratory" concept,<sup>8</sup> an advanced, distributed infrastructure that would use multimedia information technology to relax the constraints on distance, time, and even reality. It would support and enhance intellectual teamwork. There is a growing consensus that the next major paradigm shift in computing is in the direction of the collaboratory. Not only research but a vast array of human team activities in commerce, education, and the arts would be supported by variants of this vision. Perhaps some form of the collaboratory is the appropriate infrastructure ("tooling") for the "learning organization"

becoming popular in the business world; perhaps it is the basis for the world universities in the next century. It could well become the generic infrastructure on which to build the work place of the emerging information age.

There is an important implication here. Information technology may allow—perhaps even require—new paradigms for learning organizations that go beyond traditional structures such as research universities, federal research laboratories, research projects, centers, and institutes. If this is the case, we should place a far higher priority on moving to link together our students and educators among themselves and with the rest of the world. This would be a modest investment compared with the massive investments we have made in the institutions of the past—university campuses, transportation, and urban infrastructure. It is none too early to consider an over-arching agenda to develop deeper understanding of the interplay between advanced information technology and social systems. In some future time we may have the knowledge to synthesize both in an integrated way as a total system.

### Scenario #1: A Massive Restructuring of the Higher Education Industry (or "Swept Away by the Tsunami of Market Forces")

Universities have long enjoyed a monopoly over advanced education because of geographical location and their monopoly on certification through the awarding of degrees. Today all of these market constraints are being challenged, as information technology eliminates the barriers of space and time and as new competitive forces enter the marketplace to challenge credentialing.

In the current paradigm, our colleges and universities are faculty-centered. The faculty has long been accustomed to dictating what it wishes to teach, how it will teach it, and where and when the learning will occur. Students must travel to the campus to learn. They must work their way through the bureaucracy of university admissions, counseling, scheduling, and residential living. And they must pay for the privilege. If they complete the gauntlet of requirements, they are finally awarded a certificate to recognize their learning—a college degree. This process is sustained by accrediting associations, professional societies, and state and federal governments.

Yet this carefully regulated and controlled enterprise could be blown apart by several factors. First, the great demand for advanced education and training simply cannot be met by such a carefully rationed and controlled enterprise. Second, current cost structures for higher education are simply incapable of responding to the needs for high quality yet affordable education. Third, the impact of information technology will eliminate the constraints of space and time (and possibly also reality). And fourth, these forces will create an open learning

environment, in which the student will evolve into an active learner and consumer, unleashing strong market forces.

More specifically, tomorrow's student will have access to a vast array of learning opportunities, far beyond the faculty-centered institutions characterizing higher education today. Some will provide formal credentials, others will provide simply knowledge, still others will be available whenever the student—more precisely, the learner—needs the knowledge. The evolution toward such a learner-centered educational environment is both evident and irresistible.

As a result, higher education is likely to evolve from a loosely federated system of colleges and universities serving traditional students from local communities into, in effect, a knowledge and learning industry. Since nations throughout the world recognize the importance of advanced education, this industry is global in extent. With the emergence of new competitive forces and the weakening influence of traditional regulations, higher education is evolving like other “deregulated” industries, e.g., health care or communications or energy. In contrast to these other industries, which have been restructured as government regulation has disappeared, the global knowledge industry will be unleashed by emerging information technology that releases education from the constraints of space, time, and credentialing monopoly. As our society becomes ever more dependent upon new knowledge and educated people, upon knowledge workers, this global knowledge business must be viewed clearly as one of the most active growth industries of our times.

While many in the academy would undoubtedly view with derision or alarm the depiction of the higher education enterprise as an “industry” or “business,” operating in a highly competitive, increasingly deregulated, global marketplace, this is nevertheless an important perspective that will require a new paradigm for how we think about postsecondary education. It is clear that no one, no government, is in control of the higher-education industry. It responds to forces of the marketplace.

Will this restructuring of the higher education enterprise really happen? If you doubt it, just consider the health care industry. While Washington debated federal programs to control health care costs and procrastinated taking action, the marketplace took over with new paradigms such as managed care and for-profit health centers. In less than a decade the health care industry was totally changed. Today, higher education is a \$180 billion a year enterprise. It will almost certainly be “corporatized” similarly to health care. By whom? By state or federal government? Not likely. By traditional institutions such as colleges and universities working through statewide systems or national alliances such as AAU or ACE? Also unlikely. Or by the marketplace itself, as it did in health



care, spawning new players such as virtual universities and for-profit educational organizations? Perhaps. Just note a brief passage from a recent venture capital prospectus analyzing possible investments in education:

“As a result, we believe education represents the most fertile new market for investors in many years. It has a combination of large size (approximately the same size as health care), disgruntled users, lower utilization of technology, and the highest strategic importance of any activity in which this country engages. . . . Finally, existing managements are sleepy after years of monopoly.”

Several months ago, a leading information services company visited with us to discuss their perspective of the higher education market. They believe the size of the higher education enterprise in the United States during the next decade could be as large as \$30 billion per year, with 30 million students, roughly half comprised of today's traditional students, and the rest as adult learners in the workplace. (They also put the size of the world market at \$3 trillion.) Their operational model of the brave, new world of market-driven higher education suggests that this emerging domestic market for educational services could be served by a radically restructured enterprise consisting of 50,000 faculty content providers, 200,000 faculty learning "facilitators," and 1,000 faculty celebrities who would be the stars in commodity learning-ware. The learner would be linked to these faculty resources by an array of for-profit services companies, handling the production and packaging of learning-ware, the distribution and delivery of these services to learners, and the assessment and certification of learning outcomes. Quite a contrast with the current enterprise!

### Unbundling

The modern university has evolved into a monolithic institution controlling all aspects of learning. Universities provide courses at the undergraduate, graduate, and professional level; they support residential colleges, professional schools, lifelong learning, athletics, libraries, museums, and entertainment. They have assumed responsibility for all manner of activities beyond simply education—housing and feeding students, providing police and other security protection, counseling and financial services. . . even power plants on many midwestern campuses!

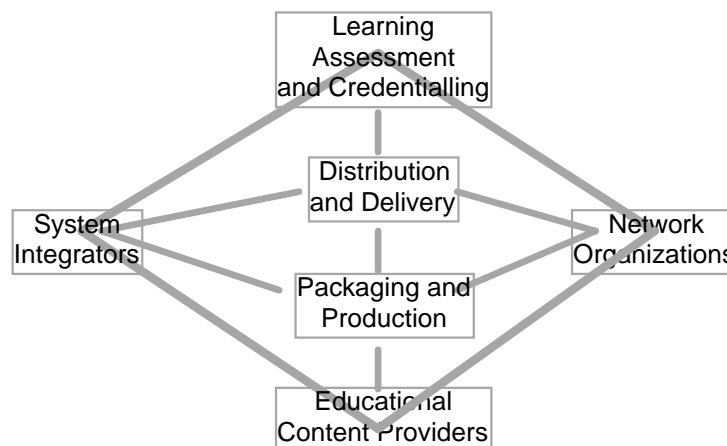
Today comprehensive universities, at least as full-service organizations, are at considerable risk. These institutions have become highly vertically integrated. We are already beginning to see the growth of differentiated competitors for many of these activities. Universities are under increasing pressure to spin off or

sell off or close down parts of their traditional operations in the face of this new competition.

The most significant impact of a restructured higher education “industry” will be to break apart this monolith, much as other industries have been broken apart through deregulation. As universities are forced to evolve from faculty-centered to learner-centered, they may well find it necessary to unbundle their many functions, ranging from admissions and counseling to instruction and certification.

An example might be useful here. Consider the rapid growth of cyberspace or virtual universities, institutions without a campus or faculty that provide computer-mediated distance education. The virtual university might be viewed as the “Nike approach” to higher education. Nike, a major supplier of athletic shoes in the United States and worldwide, does not manufacture the shoes it markets. It has decided that its strength is in marketing, and that it should outsource shoe manufacturing to those who could do it better and cheaper. In a sense, the virtual university similarly stresses marketing and delivery. It works with the marketplace to understand needs, then it outsources courses, curriculum, and other educational services from established colleges and universities—or perhaps individual faculty—and delivers it through sophisticated information technology.

There are many other examples. While we are very good at producing intellectual content for education, there may be others who are far better at packaging and delivering that content. While in the past universities have had a monopoly on certifying learning, there may be others—whether they be accreditation agencies or other kind of providers—more capable of assessing and certifying that learning has occurred. Many of our other activities, e.g., financial management and facilities management, are activities that might be outsourced to specialists.



Clearly higher education is an industry ripe for the unbundling of activities. Universities, like other institutions in our society, will have to come to terms with what their true strengths are and how those strengths support their strategies—and then be willing to outsource needed capabilities in areas where they do not have a unique competitive advantage.

### The Emergence of a Commodity Market

Throughout most of its history, higher education has been a cottage industry. Individual courses are a handicraft, made-to-order product. Faculty members design from scratch the courses they teach, whether they be for a dozen or several hundred students. They may use standard textbooks from time to time—although most do not—but their organization, their lectures, their assignments, and their exams are developed for the particular course at the time it is taught. And the costs of this handicraft approach are very high. Students would be surprised to know that their cost is approaching \$50 per lecture hour—the price of a ticket to a Broadway show—at our more elite universities.

In a very real sense, the industrial age bypassed the university. So too our social institutions for learning—schools, colleges, and universities—continue to favor programs and practices based more on past traditions than upon contemporary needs. Yet, it may be quite wrong to suggest that higher education needs to evolve into a mass production or broadcasting mode to keep pace with our civilization. In a sense, this was the evolutionary path taken by K-12 education, with disastrous consequences. Besides, even industry is rapidly discarding the mass production approach of the 20th Century and moving toward products more customized to particular markets.

Our ability to introduce new, more effective avenues for learning, not merely new media in which to convey information, will change the nature of higher education. This will bring with it new modes of organization, new relationships among universities and between universities and the private sector. The individual handicraft model for course development may give way to a much more complex method of creating instructional materials. Even the standard packaging of an undergraduate education into “courses,” in the past, required by the need to have all the students in the same place at the same time, may no longer be necessary with new forms of asynchronous learning. Of course, it will be a challenge to break the handicraft model while still protecting the traditional independence of the faculty to determine curricular content. There is also a long-standing culture in which the faculty has come to believe they own the intellectual content of their courses and are free to market these to others for

personal gain, e.g., through textbooks or off-campus consulting services. But universities may have to restructure these paradigms and renegotiate ownership of the intellectual products represented by classroom courses if they are to constrain costs and respond to the needs of society.

Let us return to our earlier example of content preparation. As we have noted, universities—more correctly, faculty—are skilled at creating the content for educational programs. Indeed, we might identify this as one of their core competencies. But they have not traditionally been particularly adept at “packaging” this content for mass audiences. To be sure, many faculty have written best-selling textbooks, but these have been produced and distributed by textbook publishers. In the future of multimedia, Net-distributed educational services, perhaps the university will have to outsource both production and distribution to those most experienced in reaching mass audiences—the entertainment industry.

As distributed virtual environments become more common, there may come a time when the classroom experience itself becomes a “commodity,” provided to anyone, anywhere, at any time—for a price. You want to take Vincent Scully’s course in modern architecture? Just sign up here. How about Stephen Jay Gould’s “Life on Earth” course? Available as well. If students could actually obtain the classroom experience of these talented teachers, why would they want to take classes from the local professor—or, in many cases, the local teaching assistant?

In such a commodity market, the role of the faculty member would change substantially. Rather than developing content and transmitting it in a classroom environment, a faculty member might instead have to manage a learning process in which students use an educational commodity, e.g., the Microsoft Virtual Modern Architecture Course. This would require a shift from the skills of intellectual analysis and classroom presentation to those of motivation, consultation, and inspiration. Welcome back, Mr. Chips!

### Mergers, Acquisitions, and Hostile Takeovers

The perception of the higher education enterprise as a deregulated industry has several other implications. As we have noted, there are over 3,600 four-year colleges and universities in the United States, characterized by a great diversity in size, mission, constituencies, and funding sources. Not only are we likely to see the appearance of new educational entities in the years ahead, but as in other deregulated industries, there could well be a period of fundamental restructuring of the enterprise itself. Some colleges and universities might disappear. Others could merge. Some might actually acquire other institutions.

A case in point: The Big Ten universities (actually there are twelve, including the University of Chicago and Penn State University) have already merged many of their activities, such as their libraries and their federal relations activities. They are exploring ways to allow students at one institution to take courses—or even degree programs—from another institution in the alliance in a transparent and convenient way. Could one imagine the Big Ten universities becoming a university system “of the heartland of America”?

One might also imagine affiliations between comprehensive research universities and liberal-arts colleges. This might allow the students enrolling at large research universities to enjoy the intense, highly personal experience of a liberal arts education at a small college while allowing the faculty members at these colleges to participate in the type of research activities only occurring on a large research campus.

One might even imagine a Darwinian process emerging with some institutions devouring their competitors in “hostile takeovers.” All such events have occurred in deregulated industries in the past, and all are possible in the future we envision for higher education.

Perhaps the most profound question of all concerns the survival of the university in the face of the changes, the emergence of new competitors. Could an institution such as the university which has existed for a millennium disappear in the face of such changes? As William Wulf suggests, if you have doubts, just think of the family farm, a social institution existing for centuries which has largely disappeared over the past three decades.<sup>9</sup>

The market forces driven by increasing demand for higher education and unleashed by technology are very powerful. Yet, if allowed to dominate and reshape the higher education enterprise, we could well find ourselves facing a brave, new world in which some of the most important values and traditions of the university fall by the wayside. While the commercial, convenience-store model of the University of Phoenix may be very effective way to meet the workplace skill needs of some adults, it certainly is not a paradigm that would be suitable for many of the higher purposes of the university. As we assess these market-driven emerging learning structures, we must bear in mind the importance of preserving the ability of the university to serve a broader public purpose.

We have suggested that the forces of change in our society are far more powerful than most realize. The waves of market pressures on our colleges and universities are building, driven by the realities of our times: the growing

correlation between one's education and quality of life, the strategic role of knowledge in determining the prosperity and security of nations, the inability of the traditional higher education institutions to monopolize an open-learning marketplace characterized by active student-learner-consumers and rapidly evolving technology. Driven by an entrepreneurial culture, both within our institutions and across American society, the early phases of a restructuring of the higher education enterprise are beginning to occur.

Without a broader recognition of the growing learning needs of our society, an exploration of more radical learning paradigms, and an overarching national strategy that acknowledges the public purpose of higher education and the important values of the academy, higher education may be driven down roads which would indeed lead to a winter of despair. Many of the pressures on our public universities are similar to those which have contributed so heavily to the current plight of K-12 education. The political process used in determining the membership and shaping the agendas of the governing boards of public universities are similar to those characterizing local school boards. As the quality of these boards deteriorate, as their political agendas increasingly dominate their trustee responsibilities, the faculty has no recourse but to circle the wagons, to accept a labor-management relationship, and to cease to regard their activities as a calling rather than a job.

Furthermore, our experience with market-driven, media-based enterprises has not been positive. The broadcasting and publication industries suggest that commercial concerns can lead to mediocrity, an intellectual wasteland in which the least common denominator of quality dominates.

## Scenario #2: A Culture of Learning (or "Renewing the Social Contract")

But there is also a spring of hope, stimulated by the recognition of the role that knowledge and learning will play in our future. Whether one refers to our times as the Information Age or the Age of Knowledge, it is clear that educated people and the knowledge they produce and utilize have become the keys to economic prosperity and well being of our society. But beyond that, one's education, knowledge, and skills have become primary determinants of one's personal standard of living, the quality of one's life. We are realizing that, just as our society has historically accepted the responsibility for providing needed services such as military security, health care, and transportation infrastructure in the past, today education has become a driving social need and societal responsibility. Today it has become the responsibility of democratic societies to provide their citizens with the education and training they need, throughout

their lives, whenever, wherever, and however they desire it, at high quality and at an affordable cost.

Of course, this has been one of the great themes of higher education in America. Each evolutionary wave of higher education has aimed at educating a broader segment of society, at creating new educational forms to do that—the public universities, the land-grant universities, the normal and technical colleges, the community colleges. But today, we must do even more.

The character of the university as we know it has been determined by a social contract for the last fifty years in which national security has been regarded as America's most compelling priority, as reflected in massive investments in campus-based research and technology. Today, in the wake of the cold war and on the brink of the age of knowledge, one could well make the argument that education itself will replace national defense as the priority for the 21st Century. Indeed, one might even suggest that this will be the new social contract which will determine the character of our educational institutions, just as the government-university research partnership did in the latter half of the 20th Century. We might even conjecture that a social contract based on developing and maintaining the abilities and talents of our people to their fullest extent could well transform our schools, colleges, and universities into new forms which would rival the research university in importance.

So what might we expect over the longer term for the future of the university? It would be impractical and foolhardy to suggest one particular model for the university of the 21st Century. The great and ever-increasing diversity characterizing higher education in America makes it clear that there will be many forms, many types of institutions serving our society. But, as we have suggested in earlier chapters, there are a number of themes which will almost certainly factor into at least some part of the higher education enterprise.

- *Learner-centered:* Just as other social institutions, our universities must become more focused on those we serve. We must transform ourselves from faculty-centered to learner-centered institutions.
- *Affordable:* Society will demand that we become far more affordable, providing educational opportunities within the resources of all citizens. Whether this occurs through greater public subsidy or dramatic restructuring of our institutions, it seems increasingly clear that our society—not to mention the world—will no longer tolerate the high-cost, low productivity paradigm that characterizes much of higher education in America today.

- *Lifelong Learning:* In an age of knowledge, the need for advanced education and skills will require both a willingness to continue to learn throughout their lives and a commitment on the part of our institutions to provide opportunities for lifelong learning. The concept of student and alumnus will merge. Our highly partitioned system of education will blend increasingly into a seamless web, in which primary and secondary education; undergraduate, graduate, and professional education; on-the-job training and continuing education; and lifelong enrichment become a continuum.
- *Interactive and Collaborative:* Already we see new forms of pedagogy: asynchronous (any time, any place) learning that utilizes emerging information technology to break the constraints of time and space, making learning opportunities more compatible with lifestyles and career needs; and interactive and collaborative learning appropriate for the digital age, the plug-and-play generation.
- *Diverse:* Finally, the great diversity characterizing higher education in America will continue, as it must to serve an increasingly diverse population with diverse needs and goals.

We will need a new paradigm for delivering education to even broader segments of our society, perhaps to all of our society, in convenient, high quality forms, at a cost all can afford. Fortunately, today's technology is rapidly breaking the constraints of space and time. It has become clear that most people, in most areas, can learn and learn well using asynchronous learning, that is, "any time, any place, any one" education. Lifetime education is rapidly becoming a reality, making learning available for anyone who wants to learn, at the time and place of their choice, without great personal effort or cost. With advances in modern information technology, the barriers in the educational system are no longer cost or technological capacity but rather perception and habit.

But even this may not be enough. Perhaps we should instead consider a future of "ubiquitous learning"—learning for everyone, every place, all the time. Indeed, in a world driven by an ever-expanding knowledge base, continuous learning, like continuous improvement, has become a necessity of life.

Rather than "an age of knowledge," we could instead aspire to a "culture of learning," in which people are continually surrounded by, immersed in, and absorbed in learning experiences. Information technology has now provided us with a means to create learning environments throughout one's life. These environments are able not only to transcend the constraints of space and time, but they, like us, are capable as well of learning and evolving to serve our changing educational needs. Higher education must define its relationship with



these emerging possibilities in order to create a compelling vision for its future as it enters the next millennium.

## Evolution or Revolution?

In spite of the growing awareness of these social forces, many within the academy still believe that change will occur only at the margins of higher education. They see the waves of change lapping on the beach as just the tide coming in, as it has so often before. They stress the role of the university in stabilizing society during a period of change rather than leading those changes. This too shall pass, they suggest, and demand that the university hold fast to its traditional roles and character. And they will do everything within their power to prevent change from occurring.

Yet, history suggests that the university must change and adapt in part to preserve these traditional roles. It is true that many, both within and outside the academy, believe that significant change must occur not simply in the higher education enterprise but in each and every one of our institutions. Yet, even most of these people see change as an evolutionary, incremental, long-term process, compatible with the values, cultures, and structure of the contemporary university.

There are a few voices, however, primarily outside the academy, who believe that both the dramatic nature and compressed time scales characterizing the changes of our times will drive not evolution but revolution. They have serious doubts about whether the challenges of our times will allow such gradual change and adaptation. They point out that there are really no precedents to follow. Some even suggest that long before reform of the educational system comes to any conclusion, the system itself will collapse.<sup>10</sup>

The forces driving change in higher education, both from within and without, may be far more powerful than most people realize. It could well be that both the pace and nature of change characterizing the higher education enterprise both in America and worldwide will be considerably beyond that which can be accommodated by business-as-usual evolution. As one of my colleagues put it, while there is certainly a good deal of exaggeration and hype about the changes in higher education for the short term—meaning five years or less—it is difficult to overstress the profound nature of the changes likely to occur in most of our institutions and in our enterprise over the longer term—a decade and beyond.

While some colleges and universities may be able to maintain their current form and market niche, others will change beyond recognition. Still others will disappear entirely. New types of institutions—perhaps even entirely new social

learning structures—will evolve to meet educational needs. In contrast to the last several decades, when colleges and universities have attempted to become more similar, the years ahead will demand greater differentiation. There will be many different paths to the future.

For the past decade we have led an effort at the University of Michigan to transform ourselves, to re-invent the institution, if you will, so that it better serves a rapidly changing world. We created a campus culture in which both excellence and innovation were our highest priorities. We restructured our finances so that we became, in effect, a privately supported public university. We dramatically increased the diversity of our campus community. We launched major efforts to build a modern environment for teaching and research using the powerful tools of information technology. Yet with each transformation step we took, with every project we launched, we became increasingly uneasy.

As we came to understand better the forces driving change in our society and its institutions, we realized that these were stronger, more profound than we had first thought. Change was occurring far more rapidly than we had anticipated. The future was becoming less certain as the range of possibilities expanded to include more radical options.

We came to the conclusion that in a world of such rapid and profound change, as we faced a future of such uncertainty, the most realistic near-term approach was to explore possible futures of the university through experimentation and discovery. That is, rather than continue to contemplate possibilities for the future through abstract study and debate, it seemed a more productive course to build several prototypes of future learning institutions as working experiments. In this way we could actively explore possible paths to the future.

For example, through a major strategic effort known as the Michigan Mandate, we altered very significantly the racial diversity of our students and faculty, thereby providing a laboratory for exploring the themes of the “diverse university”. We established campuses in Europe, Asia, and Latin America, linking them with robust information technology, to understand better the implications of becoming a “world university”. We launched major initiatives such as the Media Union (a sophisticated multimedia environment), a virtual university (the Michigan Virtual University), and played a key role in the management of the Internet to explore the “cyberspace university” theme. We launched new cross-disciplinary programs and built new community spaces that would draw students and faculty together as a model of the “divisionless university.” We placed a high priority on the visual and performing arts, integrating them with disciplines such as engineering and architecture, to better

understand the challenges of the “creative university”. And we launched an array of other initiatives, programs, and ventures, all designed to explore the future.

All of these efforts were driven by the grass-roots interests, abilities, and enthusiasm of faculty and students. Our approach as leaders of the institution was to encourage strongly a "let every flower bloom" philosophy, to respond to faculty and student proposals with "Wow! That sounds great! Let's see if we can work together to make it happen! And don't worry about the risk. If you don't fail from time to time, it is because you aren't aiming high enough!!!"

To be sure, some of these experiments were costly. Some were poorly understood and harshly criticized by those preferring the status quo. All ran a very high risk of failure, and some crashed in flames—albeit spectacularly. Yet, while such an exploratory approach was disconcerting to some and frustrating to others, fortunately there were many on our campus and beyond who viewed this phase as an exciting adventure. And all of these initiatives were important in understanding better the possible futures facing our university. All have had influence on the evolution of our university.

## The Questions Before Us

Yet many questions remain unanswered. Who will be the learners served by these institutions? Who will teach them? Who will administer and govern these institutions? Who will pay for them? What will be the character of our universities? How will they function? When will they appear?

Perhaps the most profound question of all concerns the survival of the university in the face of the changes brought on by the emergence of new competitors. That is the question raised by Drucker and other futurists. Could an institution such as the university, which has existed for a millennium, disappear in the face of such changes? Again, recall William Wulf's example of the family farm.

Most of us, of course, believe quite strongly that the university as a social institution is simply too valuable to disappear. On the other hand, there may well be forms of the university that we would have great difficulty in recognizing from our present perspective.

But it seems more constructive to suggest a somewhat different set of questions in an effort to frame the key policy issues facing higher education:

1. How do we respond to the diverse educational needs of a knowledge driven society? Here we must realize that while the educational needs of the young will

continue to be a priority, we will be challenged also to address the sophisticated learning needs of adults in the workplace while providing broader lifetime learning opportunities for all of our society.

2. Is higher education a public or a private good? To be sure, the benefits of the university clearly flow to society as a whole. But it is also the case that two generations of public policy have stressed instead the benefits of education to the individual student.

3. How do we balance the roles of market forces and public purpose in determining the future of higher education in America? Can we control market forces through public policy and public investment so that the most valuable traditions and values of the university are preserved? Or will the competitive and commercial pressures of the marketplace sweep over our institutions, leaving behind a higher education enterprise characterized by mediocrity.

4. What should be the role of the research university within the broader context of the changes likely to occur in the higher education enterprise? Should it be a leader in change? Or should it simply strive to protect the important traditions and values of the academy during this time of change.

These are some of the issues that should frame the debate about the future of higher education in America.

## The Role of the Research University

So what is the future of the research university in this restructured higher education enterprise? Will it be able to maintain its traditional roles of higher education, research, and professional training? Will it be able to protect its important academic traditions and values? Will it continue to play a leadership role in our society?

Certainly, as a primary source of basic research and the next generation of scholars and professionals, the research university will remain an asset of great value. At a time when both industry and government are shifting more toward applied research and development, the research university has become ever more important as an intellectual force in our society. Today the research faculty in these institutions have become both the leaders and the arbiters of science and scholarship for the world. This group not only leads in knowledge production and distribution, but they have become the gatekeepers and standard bearers, leading a complex knowledge system that both drives and sustains world education and learning. Furthermore, as highly educated scholars and

professionals are increasingly sought as leaders in a knowledge-driven world, these institutions should continue to play a critical role.

Yet the broader higher education enterprise is changing rapidly, driven by market forces and social policies, to serve a changing world. While the unique roles, the prestige, and the prosperity of the research university may allow it to defend the status quo for a time, this too will pose certain dangers. To be sure, it would be both unrealistic and inappropriate for our research universities to abandon their critical roles in elite education and scholarship to become heavily involved in the universal education, the ubiquitous education, needed by our society. Furthermore, the market for educational services will be broad and diverse, and the brand name for exceptional quality characterizing these institutions will still carry considerable value.

Throughout most of history of higher education in America, these same institutions have been the leaders for the broader enterprise. They have provided the faculty, the pedagogy, the textbooks and scholarly materials, and the standards for all of higher education. They have maintained a strong relationship and relevance to the rest of the enterprise, even though they were set apart in role and mission. Yet, as the rest of the enterprise changes, there is a risk that if the research university becomes too reactionary and tenacious in its defense of the status quo, it could well find itself increasingly withdrawn and perhaps even irrelevant to the rest of higher education in America and throughout the world.

There are already some early signs of this decoupling. Many colleges and universities no longer look to the graduates of the elite research universities for their faculty, since they seek candidates with broader backgrounds who are committed to education, rather than the narrowly focused scholars produced by our leading graduate schools. A quick survey of the textbooks used in higher education also suggests that the dominance of the elite institutions have come to an end. And many of the most exciting experiments in pedagogy are happening in small colleges and regional public universities, where there is more incentive to take risks when change is inevitable.

It is within this context of recognizing the unique mission and value of the research university even as we seek to preserve its relevance to the rest of the higher education that we should examine several possibilities:

### Isolation

Some of the most elite institutions may adopt a strategy of relying on their prestige and their prosperity to isolate themselves from change, to continue to do

just what they have done in the past, and to be comfortable with their roles as niche players in the higher education enterprise. And this may be a very appropriate strategy for some unique institutions, places such as MIT, Caltech, Princeton, and Chicago. But for most of the larger and comprehensive institutions, the activities of elite education and basic research are simply too expensive to sustain without some attention to the marketplace.

### Pathfinders

Perhaps a more constructive approach would be to apply the extraordinary intellectual resources of the research university to assist the broader higher education enterprise in its evolution to new learning forms. Although the research universities may not be appropriate for direct involvement in mass or universal education, they certainly are capable of providing the templates, the paradigms, that others could use. They have done this before in other areas such as health care, national defense, and the Internet. To play this role, the research university must be prepared to participate in experiments in creating possible futures for higher education.

### Alliances

Extending this role somewhat, research universities might enter into alliances with other types of educational institutions, regional universities, liberal arts colleges, community colleges, or even newly emerging forms such as for-profit or cyberspace universities. This would allow them to respond to the changing needs of societies while remaining focused on their unique missions as research universities. One could also imagine forming alliances with organizations outside of higher education, e.g., information technology, telecommunications, entertainment companies, information services providers, or even government agencies.

### Core-in-Cloud Models

Many research universities are already evolving into so-called “core-in-cloud” organizations, in which academic departments or schools conducting elite education and basic research, are surrounded by a constellation of peri-university organizations—research institutes, thinktanks, corporate R&D centers—that draw intellectual strength from the core university and provide important financial, human, and physical resources in return. Such a structure reflects the blurring of basic and applied research, education and training, the university and broader society.

## Concluding Remarks

We have entered a period of significant change in higher education as our universities attempt to respond to the challenges, opportunities, and responsibilities before them. This time of great change, of shifting paradigms, provides the context in which we must consider the changing nature of the university.

Much of this change will be driven by market forces—by a limited resource base, changing societal needs, new technologies, and new competitors. But we also must remember that higher education has a public purpose and a public obligation.<sup>11</sup> Those of us in higher education must always keep before us two questions: “Who do we serve?” and “How can we serve better?” And society must work to shape and form the markets that will in turn reshape our institutions with appropriate civic purpose.

From this perspective, it is important to understand that the most critical challenge facing most institutions will be to develop the capacity for change. They must remove the constraints that prevent them from responding to needs of rapidly changing societies, to remove unnecessary processes and administrative structures, to question existing premises and arrangements. Universities should strive to challenge, excite, and embolden all members of their academic community to embark on what should be a great adventure for higher education.

While many academics are reluctant to accept the necessity or the validity of formal planning activities, woe be it to the institutions that turn aside from strategic efforts to determine their futures. The ability of universities to adapt successfully to the revolutionary challenges they face will depend a great deal on an institution’s collective ability to learn and to continuously improve its core activities. It is critical that higher education give thoughtful attention to the design of institutional processes for planning, management, and governance. Only a concerted effort to understand the important traditions of the past, the challenges of the present, and the possibilities for the future can enable institutions to thrive during a time of such change.

Those institutions that can step up to this process of change will thrive. Those that bury their heads in the sand, that rigidly defend the status quo or even worse, some idyllic vision of a past which never existed, are at very great risk. Those institutions that are micromanaged, either from within by faculty politics or governing boards, or from without by government or public opinion, stand little chance of flourishing during a time of great change.

Certainly the need for higher education will be of increasingly important in our knowledge-driven future. The real question is not whether higher education will be transformed, but rather *how* . . . and by *whom*. If the university is capable of transforming itself to respond to the needs of a culture of learning, then what is currently perceived as the challenge of change may, in fact, become the opportunity for a renaissance in higher education in the years ahead.

It is often scary and difficult to let go of old and comfortable roles, to open ourselves to new possibilities and ways of being. Yet change brings with it the possibility of deeper connections to our students and the potential for serving a much broader sector of our society. Growth, both for an institution and for the individuals that comprise it, can come only with a step into the unknown. We must move forward together, not recklessly, but thoughtfully—with care and a deep sense of commitment to the lives and dreams of our students and our responsibilities to the broader society that created, sustains, and depends upon us.

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<sup>1</sup> Drucker, Peter, Interview, *Forbes Magazine*, 1997.

<sup>2</sup> Joseph L. Dionne and Thomas Kean, *Breaking the Social Contract: The Fiscal Crisis in Higher Education*, Report of the Commission on National Investment in Higher Education (Council for Aid to Education, New York 1997).

<sup>3</sup> David W. Breneman, Joni E. Finney, and Brian M. Roherty, *Shaping the Future: Higher Education Finance in the 1990s* (California Higher Education Policy Center, April 1997).

<sup>4</sup> Patricia J. Gumpert and Brian Pusser, Academic Restructuring: Contemporary Adaptation in Higher Education, Chapter 23 in M. Petersen, D. Dill, and L. Mets, Eds., *Planning and Management for a Changing Environment: A Handbook on Redesigning Post-Secondary Institutions* (Jossey-Bass, San Francisco, 1997).

<sup>5</sup> *American Scientist*, 1998.

<sup>6</sup> Perelman, Lewis J. , *School's Out* (Avon, New York, 1993).

<sup>7</sup> "Books, Bricks, and Bytes," *Daedalus* , Vol. 125, No. 4, Fall, 1996.

<sup>8</sup> "All the World's a Lab," *New Scientist* 2077, April 12, 1997, pp. 24-27.

<sup>9</sup> Wulf, William A., "Warning: Information Technology Will Transform the University," *Issues in Science and Technology*, Summer, 1995, pp. 46-52.

<sup>10</sup> Perelman, Lewis, Educom Report interview

<sup>11</sup> Proceedings: Special Roundtable on the public and private financing of higher education, "Shaping the Future," Joint Effort of the Pew Higher Education Roundtable and the California Higher Education Policy Center with support from the Ford Foundation and the James Irvine Foundation, 8 pp., 1996.