

The remarkable resilience of U.S. colleges and universities -- their capacity to adapt to new societal demands over the past several centuries -- has occurred because our institutions are intensely entrepreneurial. Faculty members have had the freedom, the encouragement, and the incentives to move toward varying goals in highly flexible and innovative ways.

Today, in a time of unprecedented change, our challenge is to tap that energy and creativity to transform institutions of higher education into entirely new paradigms. We must respond to the rapidly evolving needs of numerous and diverse stakeholders, question existing premises and arrangements, and eliminate unnecessary processes and administrative structures. Faculty members and administrators should work together to provide an environment in which change is regarded not as threatening but rather as an exhilarating opportunity to engage in the primary activity of a college or university: learning, in all its many forms.

The traditional model of higher education -- four-year, classroom-based undergraduate education on a residential campus; graduate education in academic disciplines and professional schools; and faculty members who are active in teaching, research, and service -- is already inadequate to describe much of higher education today. Given the current pace of change, colleges and universities may be virtually unrecognizable in the future.

Although we can never predict the future with absolute certainty, we in higher education are not relieved of the responsibility of vision. We must consider a broad range of possibilities for the college and university of the 21st century, looking for new models that suggest the extraordinary transformations that institutions may undergo in the years ahead. Among them:

* **The World University.** The American research university dominates much of the world's scholarship and research. U.S. colleges and universities currently enroll more than 490,000 foreign students, according to the Institute of International Education, and also attract faculty members from throughout the world. In the near future, some institutions will become even more global in character. We may see the establishment of several worlduniversities, in Europe, Asia, Africa, and Latin America, as focal points for various types of study of international issues --political, cultural, economic, and technological. Such universities would view their marketplace as the world, rather than as a particular nation or region. Although rooted in a local culture, they would reflect far greater international diversity in their students, faculties, and academic programs. They also would be funded through international in addition to national or state resources.

* **The Diverse University.** Our institutions serve a society of growing diversity -- ethnic, racial, cultural, economic, and geographical -- and that new reality will only continue to intensify. Although our colleges and universities have taken steps to better reflect such diversity on their campuses, we might imagine a bolder model. The diverse university would draw its

intellectual strength and character from the rich diversity of humankind, and provide an environment in which people respect and tolerate diversity in living, working, and learning together as scholars and teachers.

For universities to thrive today, we must be open to a multiplicity of approaches and opinions. At the same time, we must recognize that an institution of higher education is first and foremost a "uni"-versity, not a "di"-versity. Our challenge will be to weave together the dual objectives of unity and diversity in a way that best serves our mission and society.

* **The Creative University.** The professions that have dominated the late 20th century have been those that manage knowledge and wealth -- professions such as law, business, and politics. Yet, as predicted by the futurist Peter Drucker, our society increasingly values those activities that actually create new knowledge -- professions such as art, music, architecture, and engineering.

Perhaps some higher-education institutions of the 21st century will also shift their intellectual focus and priority from the preservation or transmission of knowledge to the process of creation itself. Such institutions may need to organize themselves quite differently, stressing forms of pedagogy and extracurricular experiences that teach and nurture the art and skills of creativity. For instance, some may replace the classroom with the studio, or shift the role of the faculty member from that of a teacher to that of the leader of a creative team.

As part of those efforts, colleges and universities might form strategic alliances with other institutions, organizations, or groups whose activities are characterized by creativity -- for example, the art world, the entertainment industry, or even Madison Avenue. One current model is the Massachusetts Institute of Technology's Media Laboratory.

* **The Divisionless University.** The higher-education institution of the future will be far less specialized and far more integrated. A web of structures, some real and some virtual, will provide both horizontal and vertical integration among the disciplines.

We have already witnessed the blurring of the distinction between basic and applied research, between science and engineering,

and among the various scientific disciplines. So, too, we are seeing a far more intimate relationship between basic academic disciplines and the professions. For example, clinical departments in medicine are conducting much of the most important basic biological research in areas such as human gene therapy. The professional schools of business, law, public health, and social work are deeply engaged in fundamental scholarship as well as teaching in the social sciences. And the humanities are continually energizing and nourishing the performing arts -- and vice versa.

* The Cyberspace University. Some of our institutions -- both traditional universities such as the University of California at Los Angeles and the Pennsylvania State University, as well as newly emerging universities like the University of Phoenix -- are already well on their way to becoming "knowledge servers," linked into a vast information network, providing their services to whoever might request them. As distributed virtual environments become more common, we might even conceive of a time when the classroom experience itself becomes a commodity, provided to anyone, anywhere, anytime -- for a price.

A cyberspace university has its limitations. Obviously, it couldn't offer a residential component, an element that can be critical, especially in serving undergraduates. Yet the possibilities opened up by computer-mediated distance learning and collaboration promise to enhance the intellectual environment for everyone.

Forward-thinking institutions of higher education should also consider and implement other, more novel, paradigms, including:

* The Adult University. Research universities must make extensive investments to attract world-class scholars, maintain extensive libraries, and construct state-of-the-art laboratory facilities -- all to achieve excellence in advanced education and scholarship. Certain institutions may decide that it is simply no longer cost-effective to provide general-education programs for young high-school graduates. Instead, like some European and Asian universities, they may admit only advanced, academically and emotionally mature students, directly into graduate and professional schools. For instance, the University of Oxford and the University of Cambridge effectively admit undergraduates into upper-division studies, relying on secondary schools to provide general education.

An adult-university approach would relieve research institutions of the responsibilities of general education and parenting -- roles for which many are not well suited, because their faculty members concentrate more on scholarship than on guiding the intellectual and emotional maturation of students. This approach might also allow research universities to shed their activities in remedial education, a rather inappropriate use of their costly resources.

Such a focusing of efforts might even reduce the public criticism that is often aimed at large, high-priced research universities.

While students and parents may complain about the education that undergraduates receive at those institutions, most appear quite happy with the quality of graduate and professional education. Furthermore, they seem quite willing to pay the necessary tuition, both because they accept the higher costs of advanced education and training, and because they see clearly the benefits of the degrees to their careers.

* The Lifelong University. In this model, an institution would commit itself, perhaps even through a contractual relationship, to a lifetime of interaction with its students. It would provide them with the education necessary to respond to their changing goals and needs after they graduated and throughout the rest of their lives. Many universities are beginning to move in that direction by rapidly expanding educational opportunities for alumni, ranging from campus-based colleges to distance-learning courses.

In addition, institutions would design programs to bring together students with alumni who have established themselves in particular careers -- thereby blurring the distinction between student and graduate, between the college and the external world.

Lifelong universities would, for instance, seek the active participation of alumni in academic programs as teachers, advisers, and role models.

* The Ubiquitous University. In the future, higher-education institutions might be conceived as nexuses of our public culture, systems that link and connect social institutions: schools, libraries, museums, performing-arts organizations, hospitals, parks, news media, and the growing universe of information providers on the Internet. Perhaps ubiquitous universities will be new social life-forms, capable of providing community learning centers and knowledge networks that are open and available to all.

Those institutions might be physically located hubs, or they might be distributed in cyberspace. They might evolve from existing colleges and universities or appear as entirely new constructs, quite different from anything we have experienced.

Although many colleges will experiment through distance learning or extension programs, the most creative efforts may come from the for-profit sector -- as a result of better access to risk capital and a more entrepreneurial culture.

* The Laboratory University. As a rule, major corporations invest several percent of their gross revenues in research and development. Ironically, however, although the contemporary university stresses research as a part of its mission, it actually invests very little to investigate future forms of teaching, scholarship, and service.

For example, if the University of Michigan were to follow the trend in business and government, it would invest roughly \$30-million to \$40-million per year in such research. In reality, like most universities, it spends only a fraction of that amount, perhaps \$1-million to \$2-million per year. Such an underinvestment in research on issues related to the core activities of higher education has become a serious problem, as the future of traditional colleges becomes increasingly uncertain.

The laboratory university could be a prototype of what a higher-education institution of the 21st century might be -- a testing site where new models would be developed and studied. Such an academic enterprise would propagate a risk-tolerant culture, in which students and faculty would be strongly encouraged to "go for it," and in which failure would be accepted as part of the learning process, associated with ambitious goals rather than poor performance.

Those paradigms could be regarded merely as abstract planning scenarios. But they had a more pragmatic purpose at Michigan during the 1990's, when the university began a major effort to transform itself to better serve the changing world. In that process, we realized that the forces driving change were so strong that we needed to do far more than contemplate the possibilities through abstract study and debate. We decided to build, as working experiments, several prototypes of future learning institutions. Considering such new paradigms provided a framework for that effort.

In fact, all of the specific experiments we embarked upon had aspects of one of more of these paradigms. We established campuses in Europe, Asia, and Latin America, connecting them through robust information technology, to study the implications of becoming a world university. We significantly enhanced the racial diversity of our students, examining the theme of the diverse university. As a model of the creative university, we launched major initiatives like the "Media Union," a sophisticated

multimedia environment that linked the visual and performing arts with the engineering, business, and other professional schools. And we developed an array of additional initiatives and ventures, all designed to explore the future.

To be sure, some of those experiments were costly. Some were harshly criticized by people who prefer the status quo. Every experiment ran a high risk of failure, and a few crashed in flames -- spectacularly, at times. But all of them were important in envisioning the possible futures that our institution may face.

It is unlikely that any college or university will assume the exact form of any one of the models. And the models themselves must adapt to an environment of continual change. But each paradigm has features that will almost certainly be part of the character of higher education in America in this century. Each represents a path that we should explore, as we seek to determine the nature of those institutions that can best serve a rapidly changing world.

The best way to predict the future is to invent it, according to an old saying in engineering. By envisioning and seeking to understand the paradigms of the college or university of the 21st century, we will, in fact, take steps to create them.

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