

Navigating the Public Research University
through the Stormy Seas of a Changing World

James J. Duderstadt
President Emeritus
University Professor of Science and Engineering
The University of Michigan

Ohio State University
Columbus, Ohio
May 15, 2003

Stimulated by federal initiatives such as the land-grant acts and the GI Bill, and supported and sustained by the investments of the states, the American public university has evolved into one of the most significant social institutions of contemporary society. Our nation's public colleges and universities have democratized higher education, extending the opportunities for a college education to all of our citizens, applying the fruits of their scholarship and research to serve the diverse needs of our society, and engaging with their local communities and regions to provide the knowledge and services critical to economic prosperity, public health, and cultural vitality.

Today America's public colleges and universities enroll over 75 percent of all college students, currently numbering some 11 million. Nearly two-thirds of all bachelor's degrees, 75% of all doctoral degrees, and 70% of the nation's engineering and technical degrees are awarded by public universities.¹ Public universities conduct the majority of the nation's campus-based research. They produce most of our doctors, lawyers, engineers, teachers, and other professionals and public leaders. They provide critical services such as agricultural and industrial technology, health care, and economic development. They enable social mobility, providing generations of students with the steppingstones to more rewarding careers and more meaningful lives.

Throughout the latter half of the 20th Century, public higher education has flourished, sustained by strong social policies and public investment aimed at providing educational access and opportunity to a growing population. Yet today, public higher education faces numerous challenges. A changing student population, far more diverse in age, ethnic background, and economic circumstance, is demanding change in our institutions. The exponential increase in new knowledge coupled with the intensifying needs for advanced education in the workplace are challenging traditional disciplines and methods of instruction. The rapidly evolving technologies of computers and the Internet are eroding constraints posed by the traditional college curriculum and stimulating new market forces for educational services. Furthermore, despite the growing needs of a knowledge-based society, public higher education frequently falls behind other society priorities such as health care, corrections, and K-12 education in its capacity to compete for limited tax dollars. Public policies aimed at access and opportunities have been replaced by concerns about educational cost, quality, and accountability. Furthermore, as our society places ever more confidence in the economic forces of the marketplace rather than the policy and programs developed by governments, there is a sense that the evolution of higher education in the twenty-first

century will be fueled by private dollars and that the influence of public policy will be replaced increasingly by market pressures.

Get any group of public university presidents together, and generally they begin with all the usual topics: money, students, politics, and, for an unfortunate few, intercollegiate athletics. But I'm going to take a somewhat different approach, first climbing up to the 100,000 foot level to provide a broader perspective of what is really going on in higher education these days. I'll then dive down to the treetop level to home in on those challenges particular to public research universities. Finally, I'll provide a few lessons learned, from the perspective of a battle-scarred veteran of the public higher education wars.

The Themes of Change in Higher Education

The Crunch

Of course, foremost on the minds of most public universities these days are the devastating cuts in appropriations as the states struggle to cope with crushing budget deficits. Alan Merton, president at George Mason University has called this the "triple whammy of increasing enrollment, declining state and philanthropic support, and rising expectations for higher education on the part of students and the broader public.

Of course, slashing support for public colleges is part of the ebb and flow of economic cycles. In bad times, state governments cut support, hoping to restore it once again in good times. But this time it may be different. As one state budget officer noted: "College leaders are fooling themselves if they think the end of this recession will be like all the others. What we're seeing is a systematic, careless withdrawal of concern and support for advanced education in this country at exactly the wrong time."

Why the doom and gloom? On the revenue side, state tax cuts enacted several years ago during good times are finally taking effect at the same time that states are increasingly unable to collect taxes on the goods and services that consumers buy; While revenues are falling, costs are rising rapidly for traditional public services such as Medicaid and public schools, and new responsibilities like security. Finally, as the Chronicle article notes: "The fact of the matter is that higher education is the single largest chunk of discretionary spending in the state budget. It is not mandated in the state constitution. It is the final thing that gets decided. Once all the other decisions are made, the Legislature will look at the table, see what change is left, and that's what goes to higher education."

The Changing Nature of the Need for Higher Education

Today, a college degree has become a necessity for most careers, and graduate education desirable for an increasing number.

- A growing population will necessitate some growth in higher education to accommodate the projected increases in the number of traditional college age students, roughly 15% across the U.S. in the next decade, and considerably more in states such as California.
- But even more growth and adaptation will be needed to respond to the educational needs of adults as they seek to adapt to the needs of the high performance workplace.
- Furthermore, such educational needs will be magnified many times on a global scale, posing both a significant opportunity and major responsibility to American higher education.²

Both young, digital-media savvy students and adult learners will likely demand

- A major shift in educational methods, away from passive classroom courses packaged into well-defined degree programs, and toward interactive, collaborative learning experiences, provided when and where the student needs the knowledge and skills.
- The increased blurring of the various stages of learning throughout one's lifetime—K-12, undergraduate, graduate, professional, job training, career shifting, lifelong enrichment—will require a far greater coordination and perhaps even a merger of various elements of our national educational infrastructure.
- We are shifting from “just-in-case” education, based on degree-based programs early in one's life, to “just-in-time” education, where knowledge and skills are obtained during a career, to “just-for-you” educational services, customized to the needs of the student.
- The student is evolving into an active learner and eventually a demanding consumer of educational services

Diversity

The increasing diversity of the American work force with respect to race, ethnicity, gender and nationality presents a similar challenge. Women, minorities, and immigrants now account for roughly 85 percent of the growth in the labor force,

currently representing 60 percent of all of our nation's workers. The full participation of currently underrepresented minorities and women is crucial to our commitment to equity and social justice, as well as to the future strength and prosperity of America. This is particularly evident in states such as California which no longer have ethnic majority populations.

The growing pluralism of our society is one of our greatest strengths and most serious challenges as a nation. The challenge of increasing diversity is complicated by social and economic factors. Far from evolving toward one America, our society continues to be hindered by the segregation and non-assimilation of minority cultures. Both the courts and legislative bodies are now challenging long-accepted programs such as affirmative action and equal opportunity.

Here, as you may know, I speak with some personal involvement since I am a named defendant in two cases involving the University of Michigan's admissions policies that will be heard by the Supreme Court later this spring (I'm the "et. al."). We don't have the time this morning to get into the intricate details of these cases (although essentially every news source in the nation has already taken a stance on one side or the other). Suffice it to say that the decisions on these cases may well define the methods we will be able to use to achieve diversity in the years ahead--for BOTH public and private higher education.

Yet, regardless of the outcome of the Michigan cases, we must continue to recognize that as both a leader of society at large and a reflection of that society, the university has a unique responsibility to develop effective models of multicultural, pluralistic communities for our nation. We must strive to achieve new levels of understanding, tolerance, and mutual fulfillment for peoples of diverse racial and cultural backgrounds both on our campuses and beyond. We need to shift our attention from simply access to educational opportunity to success in achieving educational objectives. But it has also become increasingly clear that we must do so within a new political context that will require new policies and practices.

Technology

Two years ago the presidents of our National Academies launched a project to understand better the implications of information technology for the future of the research university, which I was asked to chair.³

Let me mention three key conclusions from first phase of this study:

Point 1: The extraordinary evolutionary pace of information technology will not only continue for the foreseeable future, but it could well accelerate on a superexponential slope.

Digital technology is characterized by an exponential pace of evolution in which characteristics such as computing speed, memory, and network transmission speeds for a given price increase by a factor of 100 to 1000 every decade. Over the next decade, we will evolve from “giga” technology (in terms of computer operations per second, storage, or data transmission rates) to “tera” and then to “peta” technology (one million-billion or 10^{15}). To illustrate with an extreme example, if information technology continues to evolve at its present rate, by the year 2020, the thousand-dollar notebook computer will have a data processing speed and memory capacity roughly comparable to the human brain.⁴ Except it will be so tiny as to be almost invisible, and it will communicate with billions of other computers through wireless technology.

For planning purposes, we can assume that by the end of the decade we will have available infinite bandwidth and infinite processing power (at least compared to current capabilities). We will denominate the number of computer servers in the billions, digital sensors in the tens of billions, and software agents in the trillions. The number of people linked together by digital technology will grow from millions to billions. We will evolve from “e-commerce” and “e-government” and “e-learning” to “e-everything”, since digital devices will increasingly become our primary interfaces not only with our environment but with other people, groups, and social institutions.

Point 2: The impact of information technology on the university will likely be *profound, rapid, and discontinuous*—just as it has been and will continue to be for the economy, our society, and our social institutions (e.g., corporations, governments, and learning institutions).

Information and communications technology will affect the activities of the university (teaching, research, outreach), its organization (academic structure, faculty culture, financing and management), and the broader higher education enterprise. However, at least for the near term, meaning a decade or less, we believe the research university will continue to exist in much its present form, although meeting the challenge of emerging competitors in the marketplace will demand significant changes in how we teach, how we conduct scholarship, and how our institutions are financed.

Universities must anticipate these forces, develop appropriate strategies, and make adequate investments if they are to prosper during this period. Procrastination and inaction are the most dangerous courses for universities during a time of rapid technological change.

Point 3: It is our belief that universities should begin the development of their strategies for technology-driven change with a firm understanding of those key values, missions, and roles that should be protected and preserved during a time of transformation.

Markets

The growing and changing nature of higher education needs will trigger strong economic forces. Already, traditional sources of public support for higher education such as state appropriations or federal support for student financial aid have simply not kept pace with the growing demand. This imbalance between demand and available resources is aggravated by the increasing costs of higher education, driven as they are by the knowledge- and people-intensive nature of the enterprise as well as by the difficulty educational institutions have in containing costs and increasing productivity. It also stimulated the entry of new for-profit competitors into the education marketplace.

The weakening influence of traditional regulations and the emergence of new competitive forces, driven by changing societal needs, economic realities, and technology, are likely to drive a massive restructuring of the higher education enterprise. From our experience with other restructured sectors of the economy such as health care, transportation, communications, and energy, we could expect to see a significant reorganization of higher education, complete with the mergers, acquisitions, new competitors, and new products and services that have characterized other economic transformations. More generally, we may well be seeing the early stages of the appearance of a global knowledge and learning industry, in which the activities of traditional academic institutions converge with other knowledge-intensive organizations such as telecommunications, entertainment, and information service companies.⁵

Competition

As the competition among colleges and universities for students, faculty, resources, and reputations intensifies, there are growing concerns that the escalating “arms race” among colleges and university could create disruptive tensions among the higher education enterprise. This is aggravated by vast wealth accumulated by several of the elite private universities that allows them to buy “the best and brightest” students through generous financial aid programs (including merit-based programs) and raid outstanding faculty from less well-endowed institutions. Particularly troublesome are those elite research universities that tend to build their senior faculty by raiding established scholars from other institutions that have invested heavily in their development from the junior ranks. The growing gap between faculty salaries characterizing private and public research universities have created a Darwinian ecosystem in which wealthy elite universities have become predators feeding on the faculties of their less well-endowed prey, causing immense damage to the quality of the latter’s programs by luring away their top faculty with offers they are unable to match.

But, as in all ecosystems, evolutionary adaptation does occur. The vast wealth of predatory private universities depends on public largesse through very generous tax policies that benefit both charitable giving and endowment investments. As the faculty raiding practices of these predatory institutions become more aggressive and intrusive, the large public universities may eventually be forced to unleash their most powerful defensive weapon: political clout. After all, influential as the elite private universities may be, they are no match for the political influence of state universities, able to build and coordinate considerable political pressure in every state and within Congress. One can imagine a situation in which the pain from irresponsible faculty raids by wealthy private universities becomes so intense that the public universities are compelled to unleash the “T” word, taxes, and question the wisdom of current tax policies that sustain such vast wealth and irresponsible behavior at public expense—both taxpayers and public institutions. Needless to say, this would be the equivalent of nuclear warfare and could damage very deeply both private and public institutions. But it could happen if higher education is unable to de-escalate or at least constrain the arms race for top students and faculty.

The Skills Race

Ask any governor about state priorities these days and you are likely to hear concerns expressed about education and workforce training. The National Governors

Association notes that “The driving force behind the 21st Century economy is knowledge, and developing human capital is the best way to ensure prosperity.”

The signs of the knowledge economy are numerous. The pay gap between high school and college graduates continues to widen, doubling from a 50% premium in 1980 to 111% today. Not so well known is an even larger earnings gap between baccalaureate degree holders and those with graduate degrees. In the knowledge economy, the key asset driving corporate value is no longer physical capital or unskilled labor. Instead it is intellectual and human capital.

But here we face a major challenge, since it is increasingly clear that we are simply not providing our citizens with the learning opportunities needed for a 21st Century knowledge economy. Recent TIMMS⁶ scores suggest that despite school reform efforts of the past two decades, the United States continues to lag other nations in the mathematics and science skills of our students. Despite the growing correlation between the level of one’s education and earning capacity, only 21% of those in our population over the age of 25 have graduated from college. Furthermore, enrollments in graduate programs have held constant or declined (particularly in technical fields such as engineering and computer science) over the past two decades.⁷

The space race galvanized public concern and concentrated national attention on educating “the best and brightest,” the elite of our society. The skills race of the 21st Century will value instead the skills and knowledge of our entire workforce as a key to economic prosperity, national security, and social well-being.

Education is becoming a powerful political force. Just as the space race of the 1960s stimulated major investments in research and education, there are early signs that the skills race of the 21st Century may soon be recognized as the dominant domestic policy issue facing our nation.

Accountability

Recently, National Governors’ Association has launched a project on higher education that was based on the following principles:

- Insisting that higher education contributes to the state’s economic development, recognizing that competitive states in the 21st Century recognize that an educated workforce is critical to economic vitality.
- Confronting the challenging of educating a more diverse citizenry (“leaving no adult behind”.)

- Promoting a customer orientation by focusing on learners, employers, and the public who supports educational opportunities.
- Holding high expectations for postsecondary education providers and expecting results in areas of access, quality, cost containment, civic engagement, public/private partnerships, and innovation.

Clearly such principles will demand very significant changes not only in the nature of our colleges and universities, but in how we as stakeholders, patrons, and government bodies relate to them.

Commercialization

The efforts of universities and faculty members to capture and exploit the soaring commercial value of the intellectual property created by research and instructional activities create many opportunities and challenges for higher education. They recognize and exploit the increasing commercial value of the intellectual property developed on the campuses as an important part of their mission, but perhaps even more compelling a source of new revenue and faculty rewards. This has infected the research university with the profit objectives of a business, as both institutions and individual faculty members attempt to profit from the commercial value of the products of their research and instructional activities. Universities have adopted aggressive commercialization policies and invested heavily in technology transfer offices to encourage the development and ownership of intellectual property rather than its traditional open sharing with the broader scholarly community. They have hired teams of lawyers to defend their ownership of the intellectual property derived from their research and instruction. On occasions some institutions and faculty members have set aside the most fundamental values of the university, such as openness, academic freedom, and a willingness to challenge the status quo, in order to accommodate this growing commercial role of the research university.⁸

There is a deeper issue here. The American university has been seen as an important social institution, created by, supported by, and accountable to society at large. The key social principle sustaining the university has been the perception of education as a *public good*--that is, the university was established to benefit all of society. Like other institutions such as parks and police, it was felt that individual choice alone would not sustain an institution serving the broad range of society's education needs.

Hence public policy dictated that the university merited broad support by all of society, rather than just by the individuals benefiting from its particular educational programs.

Yet, today, even as the needs of our society for postsecondary education intensifies, we also find an erosion in the perception of education as a public good deserving of strong societal support.⁹ State and federal programs have shifted from investment in the higher education enterprise (appropriations to institutions or students) to investment in the marketplace for higher education services (tax benefits to students and parents). Whether a deliberate or involuntary response to the tightening constraints and changing priorities for public funds, the new message is that education has become a private good that should be paid for by the individuals who benefit most directly, the students. Government policies that not only enable but intensify the capacity of universities to capture and market the commercial value of the intellectual products of research and instruction represent additional steps down this slippery slope.

Education and scholarship are the primary functions of a university, its primary contributions to society, and the most significant roles of the faculty. When universities become overly distracted by other activities, they not only compromise these core missions but they also erode their priorities within our society. The shifting perspective of higher education from that of a social institution, shaped by the values and priorities of broader society, to, in effect, an industry, increasingly responsive to the marketplace only intensifies this concern. While it is important that the university accept its responsibility to transfer the knowledge produced on its campus to serve society, it should do so in such a way as to preserve its core missions, characteristics, and values.

A New Social Contract

Even more fundamentally, as we enter the new millennium, there is an increasing sense that the social contract between the university and American society may need to be reconsidered and perhaps even renegotiated once again.¹⁰ Today we have entered an era in which educated people and the knowledge they produce and use have become the keys to the economic prosperity and social well-being. Moreover, education, knowledge, and skills have become primary determinants of one's personal standard of living. One might well argue that 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 that—the public universities, the land-grant universities, the normal and technical colleges, the community colleges, and today’s emerging generation of cyberspace universities.

But we now will need new types of colleges and universities with new characteristics:

1. Just as with other social institutions, our universities must become more focused on those we serve. We must transform ourselves from faculty-centered to learner-centered institutions, becoming more responsive to what our students need to learn rather than simply what our faculties wish to teach.
2. Society will also 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 the costs of higher education, 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.
3. In an age of knowledge, the need for advanced education and skills will require both a personal willingness to continue to learn throughout life and a commitment on the part of our institutions to provide opportunities for lifelong learning. The concept of student and alumnus will merge.
4. 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.
5. Already we see new forms of pedagogy: asynchronous (anytime, anyplace) 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. In a society of learning, people would be continually

surrounded by, immersed in, and absorbed in learning experiences, i.e. ubiquitous learning, everywhere, every time, for everyone.

6. The great diversity characterizing higher education in America will continue, as it must to serve an increasingly diverse population with diverse needs and goals. But it has also become increasingly clear that we must strive to achieve diversity within a new political context that will require new policies and practices.

It is clear that the access to advanced learning opportunities is not only becoming a more pervasive need, but it could well become a defining domestic policy issue for a knowledge-driven society. Higher education must define its relationship with these emerging possibilities in order to create a compelling vision for its future as it enters the new millennium

Some Lessons Learned

Typically discussions of change in higher education begin with bread-and-butter issues such as:

1. Financing public higher education.
2. Managing (or governing) colleges and universities.
3. Developing strategies and tactics.

But from my own experience, let me suggest a somewhat different set of issues:

Values

It is important to always begin with the basics, to launch a careful reconsideration of the key roles and values that should be protected and preserved during a period of transformation. For example, how would an institution prioritize among roles such as educating the young (e.g., undergraduate education), preserving and transmitting our culture (e.g., libraries, visual and performing arts), basic research and scholarship, and serving as a responsible critic of society? Similarly, what are the most important values to protect? Clearly academic freedom, an openness to new ideas, a commitment to rigorous study, and an aspiration to the achievement of excellence

would be on the list for most institutions. But what about values and practices such as shared governance and tenure? Should these be preserved? At what expense?

A Commitment to Excellence, but in an Increasingly Diverse Way

Of course, we all aspire to excellence, but just how do we set our goals? Frank Rhodes refers past several decades as the “Harvardization” of American higher education, in which the elite research universities became the gold standard, the model that other types of institutions, whether they be large public universities, private liberal arts colleges, or even regional and community colleges, attempted to emulate. But in the years ahead, Rhodes believes that we will see the de-Harvardization of higher education, as people begin to realize that an elite paradigm which simply focuses more and more resources on fewer and fewer does not serve the needs of American society.

Rather the premium will be on the development of unique missions for each of our institutions, missions that reflect not only their tradition and their unique roles in serving society, but as well their core competency. As industry has learned, in an increasingly competitive global marketplace, you have to focus on what you can do best, where you are truly world-class, and outsource other products and services.

This will require not only that each of our colleges and universities develop a unique vision, but beyond that, that they be prepared to focus resources to achieve it. They must be prepared to shift resources when necessary, possibly reducing or even eliminating some programs and activities in order to improve or initiate others. In such decisions, it must keep in mind the important criteria of quality, centrality, and cost-effectiveness.

Engaging the Stakeholders

Next, as a social institution, the university should endeavor to listen carefully to society, learning about and understanding its varied and ever-changing needs, expectations, and perceptions of higher education. Not that responding to all of these would be desirable or even appropriate for the university. But it is important to focus more attention on those whom we were created to serve.

The Principles of Externality and Subsidiarity

University leadership and governance, management and decision-making should always reflect the fundamental values of the academy, e.g., freedom of inquiry, an openness to new ideas, a commitment to rigorous study, and a love of learning. Yet, these processes should also be willing to consider and capable of implementing institutional change when necessary to respond to the changing needs of our society.

Luc Weber, former vice-chancellor at the University of Geneva suggests that higher education would do well to draw their attention to the economic theory of federalism that was developed to address the challenges faced by the European Economic Community.¹¹ First one should stress the importance of externality in all decisions, that is, that the benefits or costs of a decision accrue not only to the members of the community which makes it but also to the broader community. In America we would recognize this as a “customer-oriented” strategy, focusing on those we serve. Second, a principle of subsidiarity should characterize governance in which all decisions ought to be made at the lowest possible level. For example to decentralize budget authority that encourage entrepreneurial behavior of faculty at the grassroots level provide good examples of this philosophy.

It is particularly important to prepare the academy for change and competition. Unnecessary constraints should be relaxed or removed. There should be more effort to link accountability with privilege on our campuses, perhaps by redefining tenure as the protection of academic freedom rather than lifetime employment security or better balancing authority and responsibility in the roles of academic administrators. It is also important to begin the task of transforming the academy by considering a radical restructuring of the graduate programs that will produce the faculties of the future.

A Word About Financing Public Higher Education

Today in the face of limited resources and more pressing social priorities, the century-long expansion of public support of higher education has slowed. While the needs of our society for advanced education can only intensify as we evolve into a knowledge-driven world culture, it is not evident that these needs will be met by further growth of our existing system of public universities.

The terms of the social contract that led to these institutions are changing rapidly. The principle of general tax support for public higher education as a public good and the partnership between the federal government and the universities for the

conduct of research are both at risk. These changes are being driven in part by increasingly limited tax resources and the declining priority given higher education in the face of other social needs.¹²

We now have at least two decades of experience that would suggest that the states are simply not able—or willing—to provide the resources to sustain growth in public higher education, at least at the rate experienced in the decades following World War II. In many parts of the nation, states will be hard pressed to even sustain the present capacity and quality of their institutions. Little wonder that public university leaders are increasingly reluctant to cede control of their activities to state governments. Some institutions are even bargaining for more autonomy from state control as an alternative to growth in state support, arguing that if granted more control over their own destiny, they can better protect their capacity to serve the public.

Most pessimistically, one might even conclude that America's great experiment of building world-class public universities supported primarily by tax dollars has come to an end. Put another way, the concept of a world-class, comprehensive state university might not be viable over the longer term, at least in terms of an institution heavily dependent upon state appropriations. It simply may not be possible to justify the level of tax support necessary to sustain the quality of these institutions in the face of other public priorities, such as health care, K-12 education, and public infrastructure needs—particularly during a time of slowly rising or stagnant economic activity.¹³

One obvious consequence of declining state support is that the several of the leading public universities may increasingly resemble private universities in the way they are financed and managed. They will move toward higher tuition-high financial aid strategies. They will use their reputation, developed and sustained during earlier times of more generous state support, to attract the resources they need from federal and private sources to replace declining state appropriations. Put another way, many will embrace a strategy to become increasingly privately financed, even as they strive to retain their public character.

The first wave of this "privatization" of support for public higher education started more than three decades ago, when public institutions began charging tuition as legislators cut back appropriations from tax dollars. It intensified with major fund-raising efforts and financial efforts such as spinning off operations such as medical centers and law and business schools.

Ironically—and perhaps not surprising in view of the nature of politics—even as public universities became less dependent on state support, state governments attempted to tighten the reins of state control with even more regulations and

bureaucracy in the name of "public accountability". Little wonder than in many states, public universities are now moving into a new phase of privatization by seeking to free themselves from state control since taxpayers now pay for such a small share of their overall operations.

Let me illustrate the point with a case study: Throughout much of the twentieth century the University of Michigan benefited from generous state support when a booming automobile industry made the Michigan economy unusually prosperous and a time when the University of Michigan was the only major university in the state. However by the 1970s, the energy crisis and foreign competition weakened Michigan's industrial economy. Furthermore, regional needs, ambitious leadership, and sympathetic political forces allowed a number of other public colleges in Michigan to grow into comprehensive universities, thereby competing directly with the University of Michigan for limited state appropriations.

During the 1950s and 1960s, almost 70 percent of the University's operating budget was provided through state appropriations from general tax revenues. However, over the past three decades, this has dropped to less than 10 percent of the University's total operating budget in the 1990s and less than 20 percent of its General and Education budget. During this period the University of Michigan evolved from "state-supported" to a "state-assisted" to a "state-related" to, today, what might be only characterized as a "state-located" university. Yet even this last identifier is questionable, since the University has campuses around the world, from Hong Kong to Seoul to Sao Paulo to Paris. In fact, the University has launched major new cyberspace "virtual" universities that have released it entirely from the constraints of geographical location. One of my colleagues suggested that University of Michigan today remains only a "state-molested" university, referring to the abuse it sometimes receives from opportunistic state politicians.

Perhaps a better way to phrase this is to observe that the University of Michigan has become, in effect, a privately-financed public university, supported by a broad array of constituencies at the national—indeed, international—level, albeit with a strong mission focused on state needs. Just as a private university, it must earn the majority of its support in the competitive marketplace (i.e., via tuition, research grants, and gifts). It allocates and manages its resources much as private universities. Yet it still retains a public character, committed to serving the people whose ancestors created it two centuries earlier.

It seems clear that the financial challenges to the public university require a serious rethinking and possibly even restructuring of all of its financial activities, from asset acquisition and allocation to financial management to cost containment.

- Universities need to explore new financial models that strive to build far more diversified funding portfolios, less dependent upon state appropriations, that enable public universities not only to increase the resources available for academic program support but moreover provide resilience against the inevitable ebb and flow of state support.
- Universities need to build adequate reserve capacity, both in the budgets of operating units and through endowment accounts.
- The allocation and management of resources, the containment of costs, and the adoption of efficiency measures common from business such as systems re-engineering and total quality management are important strategies
- But perhaps most significant is an entirely new approach to financial management, responsibility, and accountability that will enable the public university to thrive during a period of constrained public support.
- Public universities must break free those traditions that depend heavily upon generous state support, and instead manage their financial affairs much as private universities. They must become more entrepreneurial and proactive, seeking both the resources and the autonomy that will allow them to thrive in spite of the vicissitudes of public funding. In a sense, they must become privately financed and privately managed public universities.

The Need to Restructure University Governance

Many universities find that the most formidable forces controlling their destiny are political in nature—from governments, governing boards, or perhaps even public opinion. Unfortunately, these bodies are not only usually highly reactive in nature, but they frequently either constrain the institution or drive it away from strategic objectives that would better serve society as a whole. Many university presidents—particularly those associated with public universities—believe that the greatest barrier to change in

their institutions lies in the manner in which their institutions are governed, both from within and from without. Universities have a style of governance that is more adept at protecting the past than preparing for the future.

It seems clear that the public university of the 21st century will require new forms of governance and leadership capable of responding to the changing needs and emerging challenges of society. The increasing politicization of public governing boards; the ability of faculty senates to use their powers to promote special interests, delay action, and prevent reforms; and weak, ineffectual, and usually short-term administrative leadership all pose risks to the university.

Governing board members should be selected for their expertise and commitment and then held accountable for their performance and the welfare of their institutions. Their role is to provide the strategic, supportive, and critical stewardship for their institution. Faculty governance should become a true participant in the academic decision making process rather than simply being a watchdog on the administration or defenders of the status quo. Faculties also need to accept and acknowledge that strong leadership is important if their institution is to flourish during a time of significant change. Our institutions must not only develop a tolerance for strong leadership; they must demand it.

It is simply unrealistic to expect that the governance mechanisms developed decades or, in some cases, even centuries ago can serve well either the contemporary university or the society it serves. It seems clear that the university of the twenty-first century will require new patterns of governance and leadership capable of responding to the changing needs and emerging challenges of our society and its educational institutions.

Alliances

Public universities should place far greater emphasis on building alliances with other institutions that will allow them to focus on core competencies while relying on alliances to address the broader and diverse needs of society. For example, flagship research universities in some states will be under great pressure to expand enrollments to address the expanding populations of college age students, possibly at the expense of their research and service missions. It might be far more constructive for these institutions to form close alliances with regional universities and community colleges to meet these growing demands for educational opportunity. Another example would be alliances between research universities and liberal arts colleges that take mutual

advantage of the learning-intensive environment of the latter and the vast intellectual resources of the former.

Here alliances should be considered not only among institutions of higher education (e.g., partnering research universities with liberal arts colleges and community colleges) but also between higher education and the private sector (e.g., information technology and entertainment companies). Differentiation among institutions should be encouraged, while relying upon market forces rather than regulations to discourage duplication.

Experimentation

We must recognize the profound nature of the rapidly changing world faced by higher education. Many of the forces driving change are disruptive in nature, leading to quite unpredictable futures. Planning in the face of such uncertainty requires a more experimental approach to university transformation.

A personal example is useful here. During the 1990s we led an effort at the University of Michigan to transform the institution, to re-invent it so that it better served 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 Michigan 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, with each objective we achieved, we became increasingly uneasy. The forces driving change in our society and its institution were far stronger and 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,

- We explored the possible future of becoming a privately supported but publicly committed university by completely restructuring our financing, raising over \$1.4 billion in a major campaign, increasing tuition levels, dramatically increasing sponsored research support to #1 in the nation, and increasing our endowment ten-fold. Ironically, the more state support declined as a component of our revenue base (dropping to less than 10% by the late 1990s), the higher our Wall Street credit rating, finally achieving the highest AAA rating (the first for a public university).
- Through a major strategic effort known as the Michigan Mandate, we altered very significantly the racial diversity of our students and faculty, doubling the population of underrepresented minority students and faculty over a decade, 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 played leadership roles first in the building and management of the Internet and now Internet2 to explore the “cyberspace university” theme.

But, of course, not all of our experiments were successful. Some crashed in flames, in some cases spectacularly:

- We tried to spin off our academic health center, merging it with another large hospital system in Michigan to form an independent health care system. But our regents resisted this strongly, concerned that we would be giving away a valuable asset (even though we would have netted well over \$1 billion in the transaction and avoided the \$100 million annual operating losses we are now facing as managed care sweeps across Michigan).
- Although we were successful eventually in getting a Supreme Court ruling that provided relief from intrusive nature of the state’s sunshine laws, we ran into a brick wall attempting to restructure how our governing board was selected and

operated. (It remains one of the very few in the nation still determined by popular election and partisan politics.)

- And we attempted to confront our own version of Tyrannosaurus Rex by challenging our Department of Athletics to better align their athletic activities with academic priorities, e.g. recruiting real students, reshaping competitive schedules, throttling back commercialism...and even appointing a real educator, a former dean, as athletic director. Yet today we are posed to spend \$20 million on skyboxes for Michigan Stadium after expanding stadium capacity three years ago to over 110,000.

Nevertheless, in most of these cases, at least we learned something (if only our own ineffectiveness in dealing with cosmic forces such as college sports). More specifically, all of these efforts were driven by the grass-roots interests, abilities, and enthusiasm of faculty and students. 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.

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!” We tried to ban the word “NO” from our administrators.

Turning Threats into Opportunities

It is important for university leaders to approach issues and decisions concerning transformation not as threats but rather as opportunities. True, the status quo is no longer an option. However, once we accept that change is inevitable, we can use it as a strategic opportunity to control our destiny, while preserving the most important of our values and our traditions.

Creative, visionary leaders can tap the energy created by threats such as the emerging for-profit marketplace and technology to engage their campuses and to lead their institutions in new directions that will reinforce and enhance their most important roles and values.

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.¹⁴

The past decade has been such a time of significant change in higher education, as our institutions have attempted to adapt to the changing nature of resources and respond to public concerns. Undergraduate education has been significantly improved. Costs have been cut and administrations streamlined. Our campuses are far more diverse today with respect to race and gender. Our researchers are focusing their attention on key national priorities.

Yet, these changes in the university, while important, have been largely reactive rather than strategic. For the most part, our institutions still have not grappled with the extraordinary implications of an age of knowledge, a society of learning that will likely be our future.

From this perspective, it is important to understand that the most critical challenge facing most institutions will be to develop the capacity for change. As we noted earlier, universities must seek to remove the constraints that prevent them from responding to the needs of a rapidly changing society. They should strive to challenge, excite, and embolden all members of their academic communities to embark on what should be a great adventure for higher education. 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.

Clearly higher education will flourish in the decades ahead. In a knowledge-intensive society, the need for advanced education will become ever more pressing, both for individuals and society more broadly. Yet it is also likely that the university as we know it today—rather, the current constellation of diverse institutions comprising the higher education enterprise—will change in profound ways to serve a changing world. 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 society of learning, then what is currently perceived as the challenge of change may, in fact, become the opportunity for a renaissance, an age of enlightenment, in higher education in the years ahead.

For a thousand years the university has benefited our civilization as a learning community where both the young and the experienced could acquire not only

knowledge and skills, but the values and discipline of the educated mind. It has defended and propagated our cultural and intellectual heritage, while challenging our norms and beliefs. It has produced the leaders of our governments, commerce, and professions. It has both created and applied new knowledge to serve our society. And it has done so while preserving those values and principles so essential to academic learning: the freedom of inquiry, an openness to new ideas, a commitment to rigorous study, and a love of learning.¹⁵

There seems little doubt that these roles will continue to be needed by our civilization. There is little doubt as well that the university, in some form, will be needed to provide them. The university of the twenty-first century may be as different from today's institutions as the research university is from the colonial college. But its form and its continued evolution will be a consequence of transformations necessary to provide its ancient values and contributions to a changing world.

Several years ago, during a meeting with my executive officers following my announcement of my decision to step down as president and return to the faculty, one of my vice-presidents slipped me a piece of paper with the well-known quote of Machiavelli:

"There is no more delicate matter to take in hand, nor more dangerous to conduct, nor more doubtful of success, than to step up as a leader in the introduction of change. For he who innovates will have for his enemies all those who are well off under the existing order of things, and only lukewarm support in those who might be better off under the new."

After almost a decade of attempting to lead a transformational change process at the University of Michigan, I could only respond with an emphatic "AMEN!" The resistance can be intense, and the political backlash threatening.

To be sure, it is sometimes difficult to act for the future when the demands of the present can be so powerful and the traditions of the past so difficult to change.

Yet, perhaps this is the greatest challenge for our institutions, and the most important role of our leadership, in the years ahead as we attempt to build universities for the 21st Century.

¹ Almanac Issue, 2001-2002, *Chronicle of Higher Education*, Vol. XLVII, No. 1 (August 31, 2001).

² John S. Daniel, *Mega-Universities and Knowledge Media* (Kogan Page, London, 1996)

³ The co-principal investigators of the National Academies project are William A. Wulf, President of the National Academy of Engineering and Professor of Computer Science at the University of Virginia and James J. Duderstadt, Professor of Science and Engineering at the University of Michigan.

⁴ Ray Kurzweil, *The Age of Spiritual Machines: When Computers Exceed Human Intelligence* (New York: Viking, 1999).

⁵ Marvin W. Peterson and David D. Dill, "Understanding the Competitive Environment of the Postsecondary Knowledge Industry", in Planning and Management for a Changing Environment, edited by Marvin W. Peterson, David D. Dill, and Lisa A. Mets (San Francisco: Jossey-Bass Publishers, 1997) pp. 3-29.

⁶ *The Third International Mathematics and Science Study-Repeat*, National Science Foundation and Department of Education, 2001.

⁷ Douglas S. Massey, "Higher Education and Social Mobility in the United States 1940-1998 (Association of American Universities, Washington, 2000)

⁸ Eyal Press and Jennifer Washburn, "The Kept University", *The Atlantic Monthly*, March, 2000, pp. 39-54.

⁹ Robert Zemsky, "Rumbling," *Policy Perspectives*, Pew Higher Education Roundtable, sponsored by the Pew Charitable Trusts (Philadelphia: Institute for Research on Higher Education, April 1997).

¹⁰ Vernon Ehlers, "Unlocking Our Future: Toward a New National Science Policy," a report to Congress by the House Committee on Science (September 24, 1998).

¹¹ Luc Weber, "Subsidiarity in Higher Education", Glion II Conference, La Jolla, 2000

¹² Robert Zemsky, "Rumbling," *Policy Perspectives*, The Pew Higher Education Roundtable, sponsored by the Pew Charitable Trusts, (April, 1997); ¹² Robert Zemsky and Gregory Wegner, "A Very Public Agenda," *Policy Perspectives*, Vol. 8, No. 2, Knight Higher Education Collaborative, Philadelphia, (1998).

¹³ 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 (New York: Council for Aid to Education, 1997).

¹⁴ "The Glion Declaration: The University at the Millennium," *The Presidency*, Washington, D.C.: American Council on Education, Fall 1998): 27-31.

¹⁵ Werner Z. Hirsch and Luc E. Weber, "The Glion Declaration: The University at the Millennium", *The Presidency*, Fall, 1998 (American Council on Education, Washington) p.