

A FRAMING PAPER FOR RESEARCH UNIVERSITY STUDY  
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SOME PREMISES

- Congressional Premise: “America's research universities are admired throughout the world, and they have contributed immeasurably to our social and economic well-being. Our universities, to an extent unparalleled in other countries, are our Nation's primary source of long-term scientific, engineering, and medical research. We are concerned that they are at risk.”
- National Academies Premise: Research universities provide the new knowledge and train the researchers necessary to sustain an innovation-driven and globally competitive national economy. As a follow-up to the *Rising Above the Gathering Storm*, the National Academies propose to undertake a study of the competitive position of U.S. research universities, public and private, and assess their ability to maintain the quality work needed to drive economic growth and competitiveness and advance the nation's goals in health, environmental quality, energy, and national security.
- Jonathan Cole: “Within the past century, and especially within the past 60 years, the United States has built the greatest system of higher learning in the world. What has made our universities so distinguished is not the quality of our undergraduate education. Other systems of higher learning, including our own liberal-arts colleges, compete well against research universities in transmitting knowledge to undergraduates. While such transmission of knowledge is a core mission of our universities, it is not what makes them the best. Our finest universities have achieved international pre-eminence because they produce a very high percentage of the most important fundamental and practical discoveries in the world. That is true across the board: in the sciences and engineering, the social and behavioral sciences, and the humanistic disciplines.”
- JJD: One of the great strengths of American higher education is the presence of a system of world-class public and private research universities, sustained by public policies that ensure sufficient balance in financial assets, flexibility, and quality to serve the diverse needs of the nation. It is essential that federal policies in areas such as tax benefits, student financial aid, research funding, and regulation sustain quality, diversity, and balance in the research university system rather than threaten competitive balance and drive predatory behavior.
- For the past century American research universities have served as both the stepping stone for members of an increasingly diverse population to move into the knowledge professions (including science and engineering) and as a magnet to attract outstanding international students and faculty members to America as

immigrants who have played critical roles in achieving national prosperity and security.

- The core educational and research activities of research universities require subsidies from an array of patrons—federal and state governments, students, and the private sector (foundations, corporations, donors). Yet the current model for financing world-class education and research appears to be increasingly unsustainable from all sources: federal support (threatened by growing federal debt), state support (collapsing with state budgets and shifting priorities), corporate support (declining for both research and employee education), tuition (approaching a market ceiling), gifts and endowments (sufficient for only a small number of institutions), and clinical income (threatened by new health legislation).
- Both public and private universities have an obligation to serve the public purpose and meet the needs of the nation, since all benefit from public support, and while characterized by different legal status and governance, are in fact public bodies.

## SOME QUESTIONS CHARACTERIZING U.S. RESEARCH UNIVERSITIES

### 0. What is a research university?

Defined by their role in creating new knowledge and educating those capable of generating new knowledge, e.g., *Universitas Magistrorum et Scholarium*

The roughly 100 U.S. institutions that have achieved international pre-eminence in producing a very high percentage of the most important fundamental and practical discoveries in the world. They are the engines of our prosperity.

(Note Jonathan Cole: "What has made these universities so distinguished is NOT the quality of their undergraduate programs. While such transmission of knowledge is a core mission of our universities, it is now what makes them the best.")

### 1. Why are they important?

Congress: America's research universities are admired throughout the world, and they have contributed immeasurably to our social and economic well-being. Our universities, to an extent unparalleled in other countries, are our Nation's primary source of long-term scientific, engineering, and medical research.

National Academies: Research universities provide the new knowledge and train the researchers necessary to sustain an innovation-driven and globally competitive national economy.

Another view:

Glion Declaration: 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.

### 2. Whom do they serve?

The nation? The states? The world?  
The public? Industry? Students?

3. How many “world-class” research universities do we need?

Currently less than 100

30 private

60 public (use David Ward’s estimate that it takes 5 M citizens to support one world-class public research university)

Do we need more?

4. Who should support the core functions of the research university?

Old model: Privates supported by tuition, philanthropy, endowment

Publics supported by states and tuition

New model: Graduate education and research supported primarily by federal government? (Just as they are in most other nations?)

5. How should they be governed?

Old model: Privates by trustees. Publics by political governing boards

New model: Hybrid boards representing multiple constituencies?

6. How diverse should the American research system be?

Comprehensive Us? Specialized (MIT, Caltech?) Liberal Arts (Princeton?)

Graduate only (Rockefeller?)

Geographical distribution?

7. What is the balance among their roles?

Knowledge generation (research and scholarship)

Human resources (graduate education, professional education)

Knowledge diffusion (innovation, tech transfer)

Undergraduate education

Service missions

Health care

Economic development

International development

Entertainment (e.g., commercial-scale college sports???)

8. How should the research university ecosystem evolve?

Intensely competitive vs. highly coordinated

(market-driven or policy-driven)

Entrepreneurial

Federal policies

State policies

9. Patrons and missions

UG education (parents, states, endowment)  
Graduate education (feds)  
Professional education (students)  
Research and scholarship (feds)  
Culture, values, humanities (private, foundations)  
Knowledge diffusion (entrepreneurial, private sector, states, feds)  
Other patrons (investment community, international)  
Financed from “value” of degree (e.g., income-contingent loans)

10. To what degree do we need to address the internal character of the American research university, e.g., graduate education, research culture (e.g., its feudal nature of exploiting young scholars), challenges to academic integrity and values from forces such as commercialization, anti-intellectualism, etc.

## TODAY'S CHALLENGES

Unsustainable financial models: Grad ed/research requires subsidy

Ivy Model: Focus on a small, high quality UG college for future leaders who will then pay back through philanthropy resources sufficient to build a massive endowment that can be used to sustain graduate education and scholarship (Yale, Harvard, Stanford)

UC Model: Exceptionally generous state support, part of which is designed to finance world-class graduate education and scholarship (UC, UNC, UT)

Today the Ivy Model is available only to a handful of elite private universities whose endowments have reached a level of \$1 M/student or higher. With tuition levels now approaching a ceiling, it is unlikely that many other private institutions will be able to create the required endowments.

The UC Model looks increasingly problematic in the face of anticipated erosion of state support of public research universities over the next several decades as aging populations give highest priority for tax dollars to retirement security, health care, and tax relief rather than education.

In real dollars, our nation's investment in basic research peaked earlier this decade, then dropped and has remained flat in recent years. Federal policymakers have expressed a desire to bolster research funding but they have not yet followed through. Corporate support of both campus-based research and employee education has also dropped over the past decade. Furthermore, other resources that have subsidized graduate education and research such as clinical income are likely to decline in view of current federal policies (health care legislation, federal debt reduction).

In the current difficult financial climate, many private universities are facing challenging times as their endowments have seriously eroded. A few private research universities have endowments large enough to emerge strong from the current economic situation in the long-run. Smaller privates, however, may face a decade or more with depleted resources.

State appropriations, which are cyclical in nature to be sure, have over the long term declined relative to total state expenditures, personal income, and university instructional costs and operating budgets. This has had an important negative impact on public research universities with regard to faculty hiring, faculty-student ratios, research quality, and student learning outcomes even while public institutions also face growing expectations for broadening access, providing new knowledge, and meeting demands for transparency and accountability.

The outlook for improving this financial trend would have been cloudy at best given the competition for state resources from unfunded federal mandates (e.g., Medicaid) and the policy priorities of an aging population (e.g., tax reduction, health care, retirement, and security). With the current deep recession and financial storm, the outlook is even grimmer. Indeed, the sources that universities would have turned to help with

difficult budget situations—state appropriations, tuition, private philanthropy, and clinical revenue—will all be constrained for the foreseeable future.

#### Federal policies

- Inadequate support of existing federally procured research (ICR rates, cost-sharing) (roughly 25% of costs of federal research born by institutions)
- Imbalance of federal research support among the disciplines (e.g., NIH at \$32 B/Y, NSF at \$6 B/y, DOE Energy R&D at \$3 B/y)
- 1970s policy shift in grad support, away from fellowships/traineeships to research assistantships (creating a feudal system)
- Shifting balance from PhD students to postdocs (to avoid tuition costs)
- The degree to which shifting state and federal policies (e.g., tax policy, financial aid policies, tuition constraints, sponsored research policies, affirmative action constraints) differentially affect various elements of the U.S. research university enterprise.
- Absence of coherent federal policy aimed at sustaining research universities (and instead focusing on individuals, e.g., student financial aid and faculty research grants but NOT on institution building) in contrast to most other nations.

#### State policies

- This is a time when the strength, prosperity, and welfare of a nation demand a highly educated citizenry and institutions with the ability to discover new knowledge, develop innovative applications of discoveries, and transfer them to the marketplace through entrepreneurial activities. Yet such vital national needs are no longer top state priorities.
- Highly trained and skilled labor has become more mobile and innovation more globally distributed. Many of the benefits from graduate training—like the benefits of research—are public goods that provide only limited returns to the states in which they are located. The bulk of the benefits is realized beyond state boundaries. Hence, it should be no surprise that many states have concluded that they cannot, will not, and probably should not invest to sustain world-class quality in graduate and professional education— particularly at the expense of other priorities such as broadening access to baccalaureate education. Today, not only is state support woefully inadequate to achieve state goals, but state goals no longer accumulate to meet national needs.
- The declining priority that states have given to public higher education makes sense for them but is a disaster for the nation. The growing mismatch between state priorities and national needs suggests that it's time once again to realign responsibilities between the state and the nation for higher education and provide adequate resources to sustain American leadership.

Global competition (Rick Levin): “The U.S has reason to worry about the competitive position of its research universities. In the *Times Higher Education* ranking of the world’s top 100 universities, the U.S. and Europe have equal numbers and there are strong and emerging institutions from Japan, Australia, China and South Korea. Across the world, other nations are taking steps to strengthen higher education generally and to advance their research capabilities. Meanwhile, our research universities are facing critical concerns

The rapid economic development of Asia since World War II -- starting with Japan, South Korea, and Taiwan, then extending to Hong Kong and Singapore, and finally taking hold powerfully in India and mainland China -- has forever altered the global balance of power. These countries recognize the importance of an educated work force to economic growth, and they understand that investing in research makes their economies more innovative and competitive.

Today, China and India aspire to create a limited number of world-class universities. In China, the nine universities that receive the most supplemental government funding recently self-identified as the C9 -- China's Ivy League. In India, the Ministry of Human Resource Development recently announced its intention to build 14 new comprehensive universities of "world-class" stature”

Such initiatives suggest that governments in Asia understand that overhauling their higher-education systems is required to sustain economic growth in a postindustrial, knowledge-based global economy. They are making progress by investing in research, reforming traditional approaches to curricula and pedagogy, and beginning to attract outstanding faculty from abroad. Many challenges remain, but it is more likely than not that by midcentury the top Asian universities will stand among the best universities in the world.”

To this one should add the growing quality of European research universities, both because of major regional efforts such as the Bologna Process, and the commitment of nations to focus resources to build a small number of world-class universities.

## Changing environment for education and research

### Changing role and character of the faculty

Major responsibility for revenue generation added to traditional roles of teaching, research, and scholarship have overloaded many faculty members, particularly at the junior level

The use of non-tenure track instructors and lecturers that now provide the majority of undergraduate instruction in many institutions

Increasing mobility among institutions (including international mobility)

### Graduate education

Use of RAs instead of fellowships/traineeships creates feudal culture

Time to degree (and permanent positions) is lengthening



Research training now requires postdoc beyond PhD

Research paradigm shifts

- Physical and biomedical science to “big science” paradigm
  - in which hundreds (at LHC thousands) work together on massive projects
- Cyberinfrastructure paradigms
  - Augmenting theory and experiment with simulation and data mining
  - Functionally complete research environments in cyberspace
  - Social networking and immersive technologies

Winner-take-all competition: The changing nature of the interdependence of various elements of the American research university enterprise, both through competition and cooperation. The degree to which shifting state and federal policies (e.g., tax policy, financial aid policies, tuition constraints, sponsored research policies, affirmative action constraints) differentially affect various elements of the U.S. research university enterprise. Today serious imbalances have arisen in available funding, policy restrictions, and political constraints that are transforming beneficial competition into a predator-prey relationship that threatens not only numerous institutions but puts at risk the quality of the entire American research university ecosystem and hence the national interest.

Mission distraction

- Pressures to expand undergraduate enrollments (“Massification”), e.g. UC.
- Mission creep of auxiliary activities (inability to say “no” to increasing revenues)
- Growth (budgets, facilities, enrollments, football stadiums...)
- Imbalance between UG, Grad, and Prof education

Governance, Management, and Leadership: The implications of the changing needs, missions, and environment of American higher education for the leadership and governance of research universities (particularly for public universities). The complexity, scale, impact, and importance of contemporary research universities may have outstripped the capacity of lay boards to govern them with competence and accountability.

Inadequate public understanding (anti-intellectualism, costs)

- While public understands UG education, they have little understanding of the role of the “universitas” in not only creating new knowledge (and stimulating innovation) but in training those capable of generating it
- Recent university behavior has undermined public confidence.
  - Research integrity (e.g., conflict of interest)
  - Intercollegiate athletics
  - Executive compensation (Vanderbilt, Ohio State, the Gee syndrome)
  - The “free agent” phenomenon

Intellectual challenges (Jonathan Cole):

“I believe that the chief threats to our standing come from within the United States rather than from foreign competition.”

- Threats to the values of free inquiry and open communication (both political and misguided national security restrictions).
- Erosion of state support (with UC as poster child).
- Commercialization of intellectual property undermining core values of open communication.
- Intolerance of views that challenge orthodoxy.
- Impact of anti-intellectual forces on structure and values of higher learning.’

Issues to avoid

Intercollegiate athletics  
Indirect costs

## SWOT ANALYSIS

(STRENGTHS, WEAKNESSES, OPPORTUNITIES, THREATS)

## Strengths:

- National Priorities Requiring Research Universities
  - Security (Defense, Terrorism)
  - Economic Prosperity
  - Public Health
  - Preservation and Transmission of Culture
  - Citizens for a Democratic Society
  - Enlightened Criticism
- Unique Contributions of Research Universities
  - New knowledge (basic and applied R&D)
  - Scholars, scientists, researchers ("*universitas magisterium et scholarium*")
  - Knowledge-intensive professionals (engineers, doctors, teachers, etc.)
  - Knowledge-intensive services (clinical care, innovation, entrepreneurship)
  - Knowledge/ culture repositories (libraries, museums, theaters)
  - Social criticism, leadership

## Weaknesses

- Obsolete financial models
- Obsolete public policies (both federal and state)
- Inadequate alignment with U.S. priorities
- Mission creep
- Institutional competition ("winner take all", cost driver)
- STEM pipeline
- Obsolete governance, management, leadership
- Inadequate capacity for change
- Changing professoriate
- Obsolete doctoral/ postdoc training (feudal system)

## Threats

- Globalization
- Human capital (changing demographics)
- Financial sustainability (particularly of flagship public universities)
- Technological change
- Public/ political awareness
- Challenges to academic freedom and integrity
- Lack of a national strategy

## Opportunities

- Use crisis to stimulate change
- Develop new financial models for 21st Century
- Restructure graduate education ("*Flexner Report*" for the PhD)
- Rebalance competition and cooperation
- Redefine core mission ("*core-in-cloud*")
- Explore new paradigms (e.g., global, open-source, ecology)

## TOMORROW'S POSSIBILITIES

## Driving Forces

- Knowledge Economy
- Globalization
- Demographics
- Technology
- Innovation
- Global sustainability

## Game Changers

- The Need for Lifelong Learning
- The Globalization of Higher Education
- The Changing Nature of Discovery, Learning, and Innovation
- Universal Connectivity and Access to Knowledge and Learning
- Technological Singularities (e.g., sentient artificial intelligence)

## Paradigm Shifts

- Restructuring of higher education "industry"
  - Global knowledge and learning industry
  - Continued growth of for-profit sector
  - Mergers and acquisitions
  - Commodity products
  - Unbundling of missions of universities
- Open knowledge and learning paradigms (digital libraries, OCW, MOOCs)
- Learning ecologies and ecotones (intelligent tutors, immersive learning)
- Renaissance ("maker" societies)
- Enlightenment (providing the "light of knowledge and learning" to the world)
- Globally connected, knowledge and learning enabled civilizations

## WHENCE AND WHETHER THE UNIVERSITY OF THE FUTURE?

*The triad mission of the university as we know it today—teaching, research, and service—was shaped by the needs of an America of the past. Since our nation today is changing at an ever-accelerating pace, is it not appropriate to question whether our present concept of the research university, developed largely to serve a homogeneous, domestic, industrial society, must not also evolve rapidly if we are to serve the highly pluralistic, knowledge-intensive world-nation that will be the America of the 21st Century?*

*Of course, there have been many in recent years suggesting that the traditional paradigm of the public university must evolve to respond to the challenges that will confront our society in the years ahead. But will a gradual evolution of our traditional paradigm be sufficient? Or, will the changes ahead force a more dramatic, indeed revolutionary, shift in the paradigm of the contemporary research university?*

*Just as with other institutions in our society, those universities that will thrive will be those that are capable not only of responding to this future of change, but that have the capacity to relish, stimulate, and manage change. In this perspective it may well be that the continual renewal of the role, mission, values, and goals of our institutions will become the greatest challenge of all!*

The American university has changed quite considerably over the past two centuries, and it continues to evolve today. Colonial colleges have become private research universities; religious colleges formed during the early 19<sup>th</sup> century gradually became independent colleges; junior colleges have evolved into community colleges and then into regional universities. Today public research universities also continue to evolve to adapt to changes in students (from state to national to global), support (from state to national, public to private), missions (from regional to national to global), and perception (education from a public good to a private benefit). Public universities are already rapidly expanding their public purpose far beyond the borders of their states, since the more mobile the society, the more global the economy, the broader the “publics” served by the university must become.

Of course, this ever-changing nature of the university itself is part of the challenge, since it not only gives rise to an extraordinary diversity of institutions, but also a great diversity in perspectives. What is a university? Is it a “college”, in the sense of the heritage of the colonial colleges (and, before that, the English boarding schools)? Is it the 20<sup>th</sup> century image of university life—football, fraternities, Joe-college, campus protests? Is it Clark Kerr’s multiversity, accumulating ever more missions in response to expanding social needs—health care, economic development, technology transfer? Or is the true university something more intellectual: a community of masters and scholars (*universitas magistrorum et scholarium*), a school of universal learning (Newman) embracing every branch of knowledge and all possible means for making new investigations and thus advancing knowledge (Tappan)?

What is the core of its university activities? Student development (or, in the words of Lord Rugby, “transforming savages into gentlemen”). Or creating, curating, archiving, transmitting, and applying knowledge? Or serving society, responding to its contemporary needs—health care, economic development, national defense, homeland security, entertainment (e.g., athletics).

What are its core values? Critical, rigorous thinking (e.g., “the life of the mind”)? Academic freedom? Individual achievement (noting that the contemporary organization of the university is really designed to enable individuals to strive to achieve their full potential (as students, faculty, athletes).

With much the character of the proverbial elephant being felt by the blind men, it is not surprising that discussions involving the future of the university can be difficult. It is particularly difficult to ignite such discussions among university leaders, who generally fall back upon the famous Clark Kerr quote: “About 85 institutions in the Western World established by 1520 still exist in recognizable forms, with similar functions and with unbroken histories, including the Catholic Church, the Parliaments of the Isle of Man, of Iceland, and of Great Britain, several Swiss cantons, and...70 universities.”...*Hakuna Matata*

It is true that the university today looks very much like it has for decades—indeed, centuries in the case of many ancient European universities. They are still organized into academic and professional disciplines; they still base their educational programs on the traditional undergraduate, graduate, and professional discipline curricula; our universities are still governed, managed, and led as they have been for ages.

But if one looks more closely at the core activities of students and faculty, the changes over the past decade have been profound indeed. The scholarly activities of the faculty have become heavily dependent upon digital technology—rather cyberinfrastructure—whether in the sciences, humanities, arts, or professions. Although faculties still seek face-to-face discussions with colleagues, these have become the booster shot for far more frequent interactions over the Internet. Most faculty members rarely visit the library anymore, preferring to access digital resources through powerful and efficient search engines. Some have even ceased publishing in favor of the increasingly ubiquitous digital preprint or blog route. Student life and learning are also changing rapidly, as students bring onto campus with them the skills of the net generation for applying this rapidly evolving technology to their own interests, forming social groups through social networking technology (Facebook, Twitter), role playing (gaming), accessing web-based services, and inquiry-based learning, despite the insistence of their professors that they jump through the hoops of the traditional classroom paradigm.

In one sense it is amazing that the university has been able to adapt to these extraordinary transformations of its most fundamental activities, learning and scholarship, with its organization and structure largely intact. Here one might be inclined to observe that technological change tends to evolve much more rapidly than social change, suggesting that a social institution such as the university that has lasted a millennium is unlikely to change on the timescales of tech turns, although social institutions such as corporations have learned the hard way that failure to keep pace can lead to extinction. Yet, while social institutions may respond more slowly to technological change, when they do so, it is frequently with quite abrupt and

unpredictable consequences, e.g., “punctuated evolution”.

It could also be that the revolution in higher education is well underway, at least with the early adopters, and simply not sensed or recognized yet by the body of the institutions within which the changes are occurring. Universities are extraordinarily adaptable organizations, tolerating enormous redundancy and diversity. It could be that the information technology revolution is more of a tsunami that universities can float through rather than a rogue wave that will swamp them.

An alternative viewpoint of the transformation of the university might be as an evolutionary rather than a revolutionary process. Evolutionary change usually occurs first at the edge of an organization (an ecology) rather than in the center where it is likely to be extinguished. In this sense the forces that are now transforming scholarship and enabling new forms of learning communities have not yet propagated into the core of the university. Of course, from this perspective, recent efforts such as the Google Book project take on far more significance, since the morphing of the university library from stacks to Starbucks strikes at the intellectual soul of the university.

Admittedly it is also the case that futurists have a habit of overestimating the impact of new technologies in the near term and underestimating them over the longer term. There is a natural tendency to implicitly assume that the present will continue, just at an accelerated pace, and fail to anticipate the disruptive technologies and killer apps that turn predictions topsy-turvy. Yet we also know that far enough into the future, the exponential character of the evolution of Moore’s Law technologies such as info-, bio-, and nano- technology makes almost any scenario possible.

Clearly 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. Those of us in higher education must always keep before us two questions: “Whom 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. 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.

As Frank Rhodes so eloquently stated it in his closing words of reassurance in the 1999 Glion Declaration:

“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.

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. " (Rhodes, 1999)

Certainly the need for research universities will be of increasing importance in our knowledge-driven future. Certainly, too, it has become increasingly clear that our current paradigms for the university, its teaching and scholarship, its service to society, its financing, all must change rapidly and perhaps radically. Hence 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, an age of enlightenment, in higher education in the years ahead.

The remarkable resilience of universities, their capacity to adapt and change in the past, has occurred in part because it embraces and encourages an intensely entrepreneurial cultures. We have provided our faculty the freedom, the encouragement, and the incentives to move toward their personal goals in highly flexible ways, and they have done so through good times and bad. Our challenge is to tap this grassroots energy and creativity in the effort to transform our institutions to better serve a changing world.

Yet we must do so within the context of an exciting and compelling vision for the future of our institutions. Rather than allowing the university to continue to evolve as an unconstrained, transactional, entrepreneurial culture, we need to guide this process in such a way as to preserve our core missions, characteristics, and values. We must work hard to develop university communities where uncertainty is an exhilarating opportunity for learning and discovery.