

## Keeping Our Bearings in Very Rough Seas

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We have heard some extremely interesting presentations today on important developments in higher education and in the world of research. They are interesting because they place us in a very changed world of higher education. Consider, for instance, stem cell dynamics—an issue for which I’m very sensitive given the recent events in Missouri related to funding for the University’s biomedical research building. The important point is how closely stem cell issues are intertwined with political dynamics.

Prem Paul talked about the STEM (not “stem cell,” but science, technology, engineering, and mathematics) pipeline. The issue is that the American science and engineering establishment simply is not sustainable with domestic student pipeline, but rather requires a very large international student pipeline.

Joe Steinmetz addressed an important change from individual investigator research toward a team approach—especially interdisciplinary teams of scholars. This is a very positive development, but it runs contrary to many strong “customs” in higher education, which are focused on departments and academic disciplines.

Steinmetz also talked about growing disparities between “haves” and “have not” higher education institutions—that those with a large resource base are growing their resources, while those with smaller resource base (including major public research universities like those

represented at the Merrill Retreat) are increasingly challenged.

There was a good deal of talk about finding focus and achieving critical mass. The two presentations by Loretta Johnson and Steven Warren are wonderful examples of premier institutional centers of excellence, cutting across many disciplines, and defining new directions in research.

Clinical research also received a good deal of attention, especially with reference to the GCRC and CTSA initiatives from NIH, a reflection of the growing importance of clinical research in research universities.

Beth Montelone discussed programs to engage and enable junior faculty to become successful in the world of sponsored research—a key element of success for research universities... though there is a reality check in Jim Roberts’ discussion of industrial funding for research, an entirely different model.

Jordan Green's presentation described a successful line of research that focuses on a technology-dependent program which, however, has not become a priority for federal research funding, and which therefore poses special issues for sustaining the program.

Jim Roberts discussed the prospects for industrial funding to replace federal research funding — a dubious proposition to be sure, although industrial funding is certain to become a major component of university research support.

John Brighton discussed the recent crisis in funding for federal earmarks, which has caused major disruption of some long-standing programs. The future of earmarks is uncertain, though there is general agreement that earmarks won't disappear.

Steve Warren gave a timely and appropriate warning that we don't want to panic — to over-react to the changes in the higher education environment. Fluctuations are normal. I agree. Nevertheless, we have been presented with a daunting set of changes—some positive, some negative—in the world of higher education-based research, and we can't just ignore the challenges. Moreover, it would be foolish to ignore the fact that changes in the research environment are accompanied by changes in the environment for educational and service programs, and the latter can't be separated from the research programs. Money is money, and competing demands on resources closely link the two main thrusts of research universities.

I said I was going to talk about keeping our bearings in rough waters. Maybe a more appropriate metaphor would have been to address keeping our canoe steady in the tsunami. What I'd like to do now is first to talk about the underlying dynamics for what is happening in higher education, then to take a forty-thousand foot view of what we might do to address these issues.

### **Background: The Underlying Dynamics**

**Entitlement status.** So, what are the underlying dynamics? It seems to me that one of the most important is not directly related to research but has profound indirect impact. It is that higher education has effectively become an entitlement. It would be hard to overestimate the importance of the fact that the "access" rhetoric today commonly is based on the proposition that every American has a right to a college education. This proposition would have been unthinkable even twenty years ago, when post secondary education was still seen mainly as a way to get ahead, to "rise above one's roots." But now it's the base—the level to which everyone is entitled—not the way to get ahead, but the prerequisite for a good life. And, of course, this idea is supported by the wonderful fact that participation in higher education has grown greatly, and a majority of Americans now have at least some experience in post-secondary studies.

It would be difficult to argue that this is anything less than a triumph, even though many of our higher education institutions are wary of "lowering" admissions standards - restrictiveness being the currency of

prestige in higher education. In any case, we are now presented with a student body unlike any that has been seen before: a very large proportion of first-generation (largely clueless) students, of minority students, of low-income students, and so on. They are very vulnerable, and frankly, we don't really know how to handle them and, often, we don't do a very good job of serving them. The fact is that there are stunning disparities in participation in higher education by socioeconomic status (SES). One recent study showed that in 142 selective institutions, 74% of the students were from the upper SES quartile, while 4% were from the lowest quartile!

A critical contributor to the entitlement status of higher education is the fact that post-secondary education has become highly sectorized. That is, community colleges, public four-year institutions and private ones, the for-profit sector, and the university sectors are dramatically different in the populations that they serve and in the nature of the programs that they offer. Today, about 40% of post-secondary students are in community colleges—a sector that hardly existed forty years ago. And nearly 10% more are in the for-profit sector. This means that roughly half of the post-secondary students today are in traditional four-year institutions! The political implications of these facts are striking (I'll return to them later). The fact is, though, that research universities have tended to denigrate community colleges and regional four-year schools, to say nothing of the for-profit ones, and that has not served us well politically.

The point of all of this is that the university portion of higher education is dramatically re-positioned and is vulnerable insofar as it hasn't figured out how to deal with the new student body. Our success is questionable, and we are therefore vulnerable (given the entitlement status of higher education), all of which calls our credibility into question. This credibility problem is very important, given that for most people higher education is mainly about instructional programs.

**Bayh-Dole Act.** In 1980, with passage of the Bayh-Dole Act, congress repositioned higher education dramatically in the landscape of commercializing intellectual property and economic development. The critical change was that institutions of higher education could protect and commercialize intellectual property created on campus with federal support, and that repositioned them in a broad arena shared by major corporate players. Now, universities could profit from (on occasion at extraordinarily high levels) inventions of their faculty and staff coming out of federally funded research. They could partner with, license to, or compete with the corporate sector. And they could find themselves in conflict (especially in extremely costly litigation) with large corporations, both the university and corporation having a very large stake in the outcome.

It would be hard to overstate the importance of this development. In a world of global competitiveness, where the long-term economic vitality of the U.S. is under discussion...and is being challenged—in such a world, economic development issues are of great policy

and political interest. Universities are drawn into this discussion in a new way following Bayh-Dole. We are, in fact, central to the national, state, and local economic development discussion as never before, especially as development of the knowledge economy" plays itself out. This is, of course, both a big asset and a big problem. We in higher education ARE central to the discussion, a politically advantageous position to be in. But we are also at risk in several ways, the most important perhaps being that unrealistic expectations of what we can do are widespread, in no small part due to our own unrealistic expectations and claims.

As regards university research, the problem is fundamental. The legal and regulatory environment is morphing constantly in higher education's technology transfer world—e.g., in such areas as conflict of interest. Even more difficult, fundamental ethical issues about openness, about publishing research results, about academic "credit" for, say, patents or startup firms in the hiring or promotion and tenure processes: these issues challenge fundamental ethical premises of higher education. To be clear: these are not necessarily good or bad developments; they clearly are challenging and require fundamental rethinking of the basic premises of university research.

#### **Higher Education is Very Politicized**

Perhaps the most important underlying dynamic follows directly from the first two: namely, that higher education has become politicized in a way very different than at any time before. That is to say, it is of great political interest in several ways. First,

entitlements are always of compelling political interest, since they are of interest to a great number of political constituents. Any political figure can get broad interest in higher education issues (e.g., disparities in access or affordability), since they directly affect the lives of millions of constituents. In this sense, higher education is in a position much like health care was thirty years ago.

Second, and perhaps more important, higher education is now a VERY big enterprise. It touches the lives of tens of millions of people, and it is of great interest to large corporate interests. Consider the staggering amount of money in student loans. Or, think of the enormous investments (in the billions of dollars) in testing, in computers and other technologies, or in textbooks. The corporate constituents in these business arenas have a strong interest in shaping developments in higher education to enhance their businesses—a not unreasonable matter in itself. But the outcomes of such interests are not necessarily aligned with sound education policy, much as the military-industrial complex is not necessarily aligned with national economic or security interests. One can see the influence of such corporate interests in discussions of the Reauthorization of the Higher Education Act and of the Spellings Commission.

Third, our centrality in economic development discussions has also placed higher education in the center of key political discussions at the federal, state, and local levels. The economic development stakes are very high by any measure. Community viability, job

prospects, almost all aspects of quality of life—all depend on the state of the economy. And they all depend on the state of the U.S. economy in a new, and sometimes frightening, global environment. The so-called “knowledge economy” has placed universities in an interesting, desirable, and in some ways vulnerable position in political process.

The point is that higher education has become a central interest in very high-stakes politics...not necessarily policy (though the policy issues are profound), but raw politics, at both the state and federal levels. This is a world in which we have played peripherally for a long time, but the centrality of our current position is new.

**A couple of other matters.** All of the above has been exacerbated by the challenging state appropriations since the economic downturn in the early 21st century. The effects have been felt at different levels in different states, but across the country the state appropriations were reduced or grew very slowly for the past five years or so, and for state universities, the proportion of total revenue that came from the state dropped dramatically. It is now unusual for state appropriation in major state universities to be much more than 20% of the total revenues—in a few cases now, under 10%. This changes the entire business model of the university. Research is central to the challenges of public research universities, since the fundamental resources (especially faculty, graduate students, and facilities) are heavily subsidized by the universities’ “general operations” budgets.

Another area that poses major concerns, and that entails large costs is the area of compliance, much of which is directly related to research—e.g., IRB, hazardous materials, radiation safety, and animal care. In a time of fiscal challenges, compliance costs have risen dramatically, and the consequences of noncompliance are enormous. At the University of Missouri – Columbia, we recently determined that costs of compliance measures in research only—not FERPA, not fiscal matters, not SEVIS, not HIPAA—rose to more than seventeen million dollars (counting such matters as cost of time for members of IRB committees). These compliance issues are particularly serious in view of the potential for lapses to set off major political dynamics.

**A final irony.** Perhaps the most ironic observation in all of this is that with all of this change—especially the entitlement status of higher education and the political interest in access and affordability—is that the ultimate beneficiaries are the elite private institutions. When higher education was not an entitlement, when it was not the pre-condition for a good life, then higher education of just about any kind was a way to get a leg up on life. One could rise above one’s roots—even middle class ones—with a generic higher education. But now that everyone is getting it, it’s like secondary education fifty years ago, and the American dream of social mobility can best (i.e., most reliably) be done by going to the elite private institutions. And to be sure, their application numbers are soaring, their influence in core Washington discussions is growing, and in general,

privilege reigns as it did decades ago. A dramatic outcome is that there are growing disparities between the elite privates and the best publics in faculty compensation, in the socioeconomic status of students, in expenditures per student, and so on.

**Final thoughts on the fundamental dynamics of change.** The point of all of these observations is not that the sky is falling. It is that there are fundamental, probably irreversible changes in the environment for higher education in the U.S. We do not have the option to pursue business as usual, but we have to adapt to these new circumstances. In fact, these dynamics rest on some very positive changes—at least from my point of view. Universal access to higher education is a thrilling development for those of us with passion for how higher education can enrich the lives of, say, first-generation students. Having a core role in economic development is exciting, well in keeping with the universities' commitment to creativity and innovation. Even reduced reliance on state funding has positive aspects in the politically charged world in which we now find ourselves. The question is, how do we deal with these new dynamics? How do we keep our bearings, and go where we need to go, in these very rough seas?

### **How Do We Navigate These Rough Seas?**

No matter how positive a spin we put on the matter, the fact remains that we need new ways of operating. Positive change is still change. There are no magic bullets, but there are ways of thinking about our current environment

that require careful consideration. The list below is not exhaustive, but it is a start.

**Develop other sources of funds.** In his compelling keynote address to the Merrill retreat last year, John Wiley argued that privatizing public universities lies somewhere between daunting and impossible...leaning strongly toward the latter. That said, there remain many possibilities for developing new net revenues. Some are obvious (e.g., philanthropic fundraising, tech transfer revenues), though we are often delusional in thinking about the magnitude of their potential. Some challenge the culture of higher education (e.g., commercializing intellectual property, and business-like enrollment management, the latter a problem primarily for public universities). But there is significant potential.

Development has long been a key activity at major privates. A small number of public universities have been seriously and effectively engaged for many years (University of Kansas and University of Nebraska – Lincoln among them), and some of those only recently committed have had major successes (e.g., the University of Missouri – Columbia is closing in on a successful billion dollar campaign). But realistically, while a billion dollar endowment is a significant accomplishment, and while the payout of roughly fifty million dollars a year is a very significant marginal enhancement of total revenues, it is not a replacement for the state appropriation at most public universities. Strong development successes require major investments and take years to bring to fruition, but they

will be a key element in our future financial viability.

The volatile environment for federal research funding has given rise to discussions of how industrial funding can significantly replace federal grants. Corporate collaborations may provide another avenue to tapping funds from the private sector. There certainly is promise in these new kinds of relations, but there are also complexities in regard to traditional academic values about openness, publishing research results, and related matters. These issues converge in important ways with technology transfer initiatives by which intellectual property created at universities is commercialized—e.g., as the base of start-up companies, or by licensing to private firms. Again, tech transfer often gives rise to conflicts with traditional values, though it should be added that the issues are complex and there is by no means consensus in the academy. Moreover, universities take significant risks of many kinds, including the danger of ownership being challenged on any “big hits.”

Community partnerships have become more important in several ways. The University of Kansas Medical Center, for instance, is developing a massive community partnership to develop the resource base and to pursue collaboration with local hospitals, UMKC, and the Stowers Institute. The University of Missouri – Columbia is working closely with the city of Columbia on co-developing the interface (an area of several square blocks) between campus and downtown. The University also works closely with the city in economic development activities.

Working closely with local corporate partners in joint R&D and other areas is another example of community/university collaboration. Such initiatives have important potential to provide important marginal increments in resources.

Perhaps the most promising strategies revolve around effective enrollment management. If universities can shape their program inventory and their student body favorably, they may generate large amounts of new net revenue. This requires very business-like systems for understanding marginal costs, for shaping the student body to grow areas with sufficiently low marginal costs that significant profit centers can be created.

Finally, it is critical that public universities position themselves effectively in their states. State appropriations are a major part of total revenue at all state institutions even though they have dropped to less than 20% at most large public research universities. Making the most of state relationships is still either the largest or second largest revenue source (particularly unrestricted revenue) at most major public universities. Effective positioning may assure that the university receives more favorable appropriations than would otherwise occur.

**Serious planning.** Serious planning is a complex and demanding process that underlies disciplined and strategic use of financial resources, shaping of research and educational programs, careful development of physical infrastructure, effective recruitment and development of faculty and other

human resources, and pursuit of many other key elements of a successful institution of higher education. Stature and recognition in higher education comes only after achievement for many years—a decade or two—after which informed observers come to expect high performance. Without such stature, success in research, recruiting high-level faculty, fundraising, and other areas is compromised. It is clear that the research proposals from, say, Michigan or Wisconsin are read very differently than those from regional universities. Similarly, major donors are attracted to high-profile institutions. And faculty and students clearly prefer institutions of high status, whose degrees have high cash value. Taken all together, stature and recognition are nearly everything in these areas.

Perhaps the most important means of achieving high stature are two seemingly contradictory capabilities: continuity and adaptability. Disciplined and strategic continuity of investment in facilities, faculty, students, and other elements of great schools is necessary to build critical mass and to achieve long-lasting performance that becomes recognized widely. Investments must cumulate, as must significant successes, and “thematic” continuity is a prerequisite for such cumulative success. But at the same time continuity of investment and purpose is being achieved, the institution’s environment is in constant flux (e.g., federal funding, competitive environment, changes in the academic disciplines), and the institution must adapt constantly. Good plans are layered such that mission statement and broad goals are very robust, essentially

unchanged for decades, while tactical plans by which the broad goals are achieved are constantly adapting to the environment. Any plan that lacks either long-term continuity or agility and adaptability will fail.

A budget is a financial plan. Any strategic plan that is not aligned with the budget is simply not a plan, though it may take the form of one. Any budget that is not aligned with the strategic plan is not really a budget (i.e., a financial plan). Achieving goals requires resources of many kinds, and short of simple luck, major success at achieving goals over a long period requires very disciplined use of resources.

Few universities are sufficiently resourced to compete head-to-head with the best institutions in those institutions’ areas of strength. For example, The University of Missouri’s Psychology Department has approximately 35 faculty, while that at Michigan has more than twice as many. Clearly, taking on Michigan broadly is at best a long shot. But if Missouri can identify the institution’s unique assets that can position it uniquely in higher education, Missouri may lay claim to territory in which Michigan simply can’t compete effectively. Strategic positioning, on the basis of unique assets, is a key part of planning to enhance competitiveness and ultimately stature. Such strategic assets can take many forms—e.g., unique facility, unique program mix, campus culture, strong corporate partners, or proximity to large government labs.

**Regional cooperation.** One way to extend the principle of strategic positioning is to look for regional



strategic advantages—regional assets that can be exploited collaboratively in ways that the individual universities in the region could not achieve by themselves. Thus, for instance, a unique mix of program strengths across a region may allow collaborative successes, especially if there were other strengths that intersected the program mix—e.g., strong corporate partners or an unusual physical environment. Other regional strategies might be based on expensive facilities or instrumentation that no one institution or state could support, but that would be the foundation for making a special mix of programs achieve at a very high level. The political barriers (both within and outside the academy) to such collaboration are often extremely constraining, especially given the states' competitiveness in areas like economic development. But, in fact, regional academic cooperation can be a key ingredient to regional economic development, allowing states to achieve things together that no single state could achieve alone.

**Getting past our history.** Much of the institutional structure and process of higher education is a product of history, growing from an environment that is barely relevant to today's needs. The idea of graduating in four years (why not three and a half, or six?) is arbitrary at best. The time depends on the program of study and students' position in life. Dividing the curriculum into three-semester-hour segments (i.e., "courses") that meet three hours a week for fourteen weeks is arbitrary as well. (Often we have a course-bank rather than a curriculum; that's another problem, though perhaps related to the

arbitrariness of the course structure.) One could argue that the idea of semesters, the three-hour course structure, and related institutions are logistically required, but I cannot believe we are so uncreative as to be unable to rethink this structure in a logistically viable way. Some higher education institutions have, of course, done interesting innovations—e.g., block courses at Colorado College, multiple formats in many MBA programs, and problem-based learning in some medical schools. But the point is that we usually think of the structure of higher education—especially curriculum and instruction—in ways that are very constraining, probably not cost-effective, and not the best ways to support student learning.

**Get serious about impact as the measure of success.** We often seem to focus less on the impact of our work than on trivial "indicators" of productivity like number of pages (or papers) published, grant funding received, or the number of credit hours generated. Much of the stature of higher education institutions is based on characteristics such as restrictiveness of admissions, not the impact of the institutions on students. These are at best crude indicators of impact, and at worst (and most likely) they are misleading, covering up our real impact or lack thereof. There are many areas in which one can find such inattention to impact; a few follow.

The area that probably receives the most attention these days is in looking at educational outcomes. Much of this discussion revolves around the tendency in higher education to assess students on

the basis of subject matter knowledge in “courses” (i.e., grading), where the course objectives are primarily framed in terms of subject matter coverage. Mastery tends to be measured in terms of control of content, not ability to use it effectively, for instance. There is broad agreement today that more attention must be directed to defining learning outcomes and assessing students’ proficiency, but we have a long way to go. More unsettling, perhaps, is the fact that as learning outcomes become “fashionable,” we drift into a by-the-numbers approach to the issue that better serves the cause of easy assessment than of deep and effective learning.

In the research area, we tend to rely almost entirely on “poundage” (i.e., the volume of publications), sometimes on citations, and on research dollars generated. The exceptions are for those truly world-shaking research outcomes that are recognized by Nobel Prizes, Pulitzer Prizes, or election to the National Academies. I am not convinced by the argument that we need hard measures of productivity; in the end judgmental assessment is the only key to determining impact or potential impact. It is not too much of a stretch to argue that the desirability of clear and objective measures would lead journals to accept or reject articles on the basis of an algorithm that counted the number of words in the average sentence, the number of complex versus simple sentences, and the number of words over eight letters—an obviously foolish idea, but I would argue not a great deal more foolish than the poundage criterion.

Tenure, an extremely valuable, even critical, part of our academic traditions, has taken directions that actually inhibit high impact research. The way we have implemented it provides incentives for junior faculty to avoid difficult and significant research (or teaching assignments, for that matter) in their pre-tenure years to assure the level of productivity (i.e., poundage) that assures tenure. They are often explicitly counseled to do safe projects that will assure several publications (minimal publishable units) that by definition are unlikely to have real impact. The worst part of this unfortunate practice is that junior faculty are socialized to a kind of risk aversion that virtually guarantees that we will see a great deal of research, the absence of which would have left the world no poorer. Again, judgmental assessment of the impact of the work is necessary. I tell tenure and promotion committees that I would much rather tenure and/or promote someone who took on a very difficult and significant problem, made a good effort, and failed than to tenure the risk-averse person who published twenty essentially meaningless minimal publishable units.

### **Conclusion**

The point of this all is that we in higher education are in a new world. The environment has changed; the nature of higher education institutions has changed; public expectations have changed. It’s challenging, but many of the changes, especially the broad participation and entitlement status, are really triumphs. But business as usual will not work. We are at serious risk of losing all that we value if we don’t adapt.