KEYNOTE ADDRESS – Day 1

POLICY ISSUES AND INSTITUTIONAL RESPONSES:
THE GRADUATE DEAN AS THE 21ST-CENTURY JANUS

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Roman mythology tells us that the god Janus hovered over the threshold of the Roman home, facing in two directions at once as he offered both protection and profit to the household. Today our graduate deans are the Janus-faced figures of the modern era, gazing in both directions to protect against threats and capture opportunities to enrich the graduate education offered to our students. As the president of the Council of Graduate Schools, the organization that provides a national voice for these deans, I spend much time reflecting on the threats and opportunities our members face.

Graduate education is by all reasonable accounts one of our country's most successful enterprises. It is large and growing larger:

Size of the Graduate Education Enterprise
- 1700 institutions
- 1.8 million students
- ½ million degrees earned annually
  - 460,000 master's degrees
  - 41,000 doctoral degrees

And all indicators are that it will continue to grow:

Trends: Undergraduate Expectations and Reality
- 75% of college freshmen expect to earn a graduate or first professional degree.
- In the first five years after earning the baccalaureate:
  - 39% have taken the GRE
  - 41% have applied for admission
  - 35% have been accepted into at least one program
  - 30% have enrolled in a graduate or first professional degree program

So, with this seemingly bright picture, what possible threats could graduate schools and graduate faculty be facing? Today I will outline four policy issues that pose the greatest challenges—and, in many cases, the greatest opportunities—for our institutions.

Each policy issue engages a particular subset of stakeholders, but taken together, they engage all of the stakeholders in the graduate enterprise, both inside and outside the university. The four policy issues are:

- Curriculum Innovation and Reform
- Quality Assessment of the Ph.D.
- Sources and Structure of Student Funding
- Post-9/11 Policies

The key stakeholders for "reform" in graduate education are faculty, students, graduate schools and, of course, employers. In terms of Ph.D. assessment, there are three major categories of stakeholders: national organizations (the National Research Council, the Council of Graduate Schools and the National Academy of Sciences), academic administrators, and our "bankers." The stakeholders for the funding policy issues include federal funding agencies, state policy-makers, academic administrators, and researchers and faculty. Finally, there are numerous stakeholders in post-9/11 policy-making, including federal officials (State Department, Justice, Homeland Security), academic administrators, researchers, and, of course, international students.

The Challenge of Curriculum Reform

Most academics of my generation have accepted, as an article of faith, that doctoral education in the U.S. is one of the country's most successful enterprises, as evidenced by the more than 220,000 international graduate students enrolled in our programs and by the remarkable success of our research enterprise. Thus many faculty and academic leaders were not prepared for the findings of a series of studies conducted during the last ten years, which reported the views of more recent Ph.D.s on the quality of their graduate experience. These studies concluded that although recent Ph.D.s are satisfied with their graduate school experience overall, and although they value the research training they have received, they are distinctly less satisfied with the process and outcomes of the doctoral experience.

Specifically, current doctoral students and recent alumni want more:

1. Curriculum breadth and opportunity for interdisciplinary study
2. Information about the process and outcomes of graduate study before they start—i.e., a process with more transparency
3. Attention to the job skills required in the marketplace
4. Effective career guidance and job placement (non-academic as well as academic)

The bottom line of these studies is that for the doctoral students and new Ph.D.s surveyed, more that 50% of whom find their first jobs in the non-academic sector, the vaunted American Ph.D. did not prepare them as well as it should have for

the jobs they got or for the careers they followed. And these sentiments are generally shared by their employers.

These studies have led to a proliferation of "reform" activities in graduate schools across the country. Besides local efforts, they include a number of nationally directed movements that began in 1993 with the "Preparing Future Faculty" initiative, directed out of the Council of Graduate Schools, and that continued with others like the Carnegie Initiative on the Doctorate, the Re-envisioning the Ph.D. program, the Responsive Ph.D. Project, and the Sloan Professional Science Master's programs. We can talk about the specifics of these various reform efforts during the course of the next several days, but here I simply want to indicate that demands for reform are churning the waters in our graduate schools at both the doctoral and the master's level, and our deans are engaging faculty, students, employers, and fellow administrators in the discussion. The policy challenge for universities is to respond creatively to these calls for reform while preserving the strength of the research enterprise to which graduate education is so closely linked.

The Challenge of Ph.D. Quality Assessment

The second policy challenge has to do with the assessment of our doctoral programs. The key question is: How effectively are we assessing the quality of doctoral education in light of the significant changes it is undergoing, in terms of both the function of the doctoral degree and the content of doctoral fields of study?

Graduate education enjoys deep support from the U.S. It has earned such confidence not only because of its tight coupling with the research enterprise, which is seen as contributing to the American economy, but also because historically it has conducted rigorous self-assessment. Once a decade for the last 40 years, a national assessment has ranked doctoral research programs based on the best knowledge available at the time. The National Research Council (NRC) is now poised to launch the next study but is encountering considerable controversy—for two reasons. First, there are new demands to incorporate "reform" criteria as metrics for quality. Second, to assess anything, the unit of analysis—here the doctoral program—needs sharp delineation of boundaries; yet the dominant curricular trend in the last decade has been the *blurring* of boundaries, as graduate training comes to mirror interdisciplinary research.

One question that the NRC will need to confront as it formulates the parameters of the 2005 assessment is: "How should the new insights from the doctoral reform movements be incorporated into the forthcoming assessment?" Stated another way, "Should actual career outcomes be used to assess the quality of our doctoral programs?" In previous assessments, the scholarly quality of the program, as evaluated by faculty peers at research-intensive universities, was assumed to be a proxy for overall doctoral program quality. But today, when

nearly half of the Ph.D.s are employed outside academe and a high percentage of those working in academe are faculty in non-research intensive universities, many stakeholders are calling for a more outcomes-oriented scheme of measurement.

A second question with which the NRC has struggled relates to the unit of analysis that should be considered for purposes of quality assessment. A major impact of the explosion of interdisciplinary research and teaching over the past decade is that the boundaries of disciplines are blurring in ways that challenge those who want to compare the quality of Ph.D. programs in a specific field across all universities offering the Ph.D. in that field. Examples of these hybrid fields range from Bioinformatics to Electronic Materials Science, from Nanotechnology to Functional Genomics. Yet comparison among programs is essential if we are to continue moving the quality of graduate education forward. So while enormously enriching for student learning and for research, interdisciplinarity poses puzzles to those both inside and outside universities who must award resources through rigorous assessment-based competition.

With respect to assessment itself, the challenge is to move assessment methodology forward in a way that accommodates the changes underway in the doctoral enterprise and simultaneously facilitates rigorous assessment that engages a broad set of stakeholders, including the national organizations that both conduct and depend on the assessment (National Research Council, the National Science Foundation, the National Institutes of Health, the Department of Education, etc.), governing boards of state universities, and senior leadership in all of our institutions (presidents, provosts, graduate deans, research leaders).

The Challenge of Funding Policy

The third policy challenge facing graduate education in the U.S. is the ubiquitous challenge of funding. The challenge relates both to ensuring the appropriate level of funding for graduate students and to packaging it in a way that best supports the evolving graduate educational objectives.

As you know, there are basically three sources of support for graduate students: university sources which, in a public institution, may be enrollment-generated or appropriated directly through a state budget process, federal sources channeled through federal agencies, such as the National Science Foundation (NSF), the National Institutes of Health (NIH), the Department of Energy, the Department of Defense, and private sources dedicated to graduate education. But whatever the source, the student receives the funding in one of three forms: the teaching assistantship (typically university support based on state funding), the research assistantship (typically, though not exclusively, federal support based on traineeships or research grants to faculty), and non-service fellowships (typically from university endowments, federal agencies such as the NSF, or private organizations such as the Howard Hughes or the Jack

Kent Cooke Foundations). In science and engineering, the lion's share of support comes from federal research grants, but most students are supported by a blend of these sources and forms of support over the course of their studies.

I began by noting that challenges reside both in the level of funding and in its packaging as awards to individual students. First, regarding funding levels: The federal investment in doctoral education has been significant for decades and is the principal source of support in science and engineering fields. With the doubling of the NIH budget and a target of doubling the NSF budget, the flow of dollars into doctoral education is on the rise, pushing the NSF fellowship awards from $21,000 to $25,000 to $30,000 in three years. There is even some discussion that stipends for federally funded research assistantships will be pressured to follow the fellowships to the $30,000 level.

But at the state level, the trends are in the opposite direction. The state universities are experiencing some of the most dramatic budget cuts in decades, as states attempt to respond to their constitutional mandates to balance the state budgets. Deficits range from significant to catastrophic, with an inevitable impact on state-supported teaching and research assistantships. The participants here from Kansas, Missouri, Iowa, or Nebraska all have their own stories to tell in this regard. And this is happening at a time when demand for graduate education is up across the board, as graduate enrollment predictably moves in an inverse relationship to the economy. If these challenges concerning funding sources were not enough, at the same time serious questions are being raised about the packaging of funding for the individual student.

We know from "reform"-based research that some combinations of support are more likely to result in a good outcome for students than others and, in particular, that some are more likely to ensure that students actually complete their degrees. We also know that placing time limits on support will encourage both faculty and students to make sure the student graduates. We know that for women it is critical to have experience as a research assistant. And we know that when financial support mechanisms build participation of students into the academic life of the department or program, students are more likely to succeed.

The current policy challenge—and this engages a series of stakeholders (federal funding agencies, state officials, university administrators including graduate deans, and research faculty)—is to build as many of the insights about support packaging as possible into the requirements of federal support programs without binding research PI's in ways that damage the effectiveness of the research enterprise. The IGERT program at the National Science Foundation and GAANN program at the Department of Education illustrate efforts to meet this challenge. But the bulk of federal funding is still through the PI-supported research assistantships, where the decisions as to the process and opportunities linked to each assistantship belong exclusively to the funding Principal

Investigator (PI). Therein lies the biggest challenge, and I look forward to more discussion on this topic over the course of our retreat.

The Challenge of Post-9/11 Policy

There is no way to discuss developments in doctoral education today in the U.S. without some reference to the residual effects of 9/11. The legislation enacted in the wake of 9/11 has clarified for all observers the extraordinary dependence of some graduate fields on the constant flow of international students. Currently, international students constitute only 16% of all graduate students enrolled in American universities, but they are 50% of all doctoral recipients in engineering, 48% in computer science, 43% in mathematics and 55% in economics. U.S. graduate schools have benefited from this wonderful talent from around the world. But the implementation of the post-9/11 legislation regarding foreign nationals, which in principle enjoyed support from the entire university community represented in Washington, has resulted in implementation procedures that will inevitably slow the flow of foreign talent to our shores. And this is happening just at the time when our competitors around the world are ratcheting up their graduate training capacity. The seeming inability of the United States to develop a robust domestic talent pool for doctoral study in science and engineering is approaching a national crisis. Much of the national discussion in recent weeks about the U.S. Supreme Court decision on the constitutionality of the University of Michigan's affirmative action program is really a discussion about how America can prepare effective pathways to graduate school for historically disadvantaged groups to meet its future workforce needs. Futurists tell us that children of these families will soon constitute a majority of those graduating from high school in the U.S., and thus this is a talent pool that our country cannot afford to ignore.

The challenge to our universities is to maintain openness to young scholars from around the world and simultaneously redouble our efforts to expand graduate preparation and opportunity for historically underrepresented groups. It also means redoubling our efforts to graduate those whom we admit to our programs from all segments of American society—another topic for discussion throughout our retreat.

The Leadership Response

This morning I have shared with you four major policy challenges facing graduate education in science and engineering today. How well are we responding to these challenges? Frankly, given the diversity of universities and stakeholders engaged in the enterprise, it is difficult to say. However, I can say where the responsibility for crafting an effective response lies.

Across all the unique settings in the U.S. within which graduate education is conducted is a common structure called the "Graduate School." The Graduate

School, as you know, is the place in the research university charged with responding to and integrating the varied interests of students, faculty, and key external stakeholders to advance that particular university's graduate education mission. It is the central office charged with oversight of graduate programs and graduate students. The graduate dean brings a university-wide perspective to issues across departmental and disciplinary boundaries. Our graduate deans, who sometimes also hold the title of Vice President for Research, interpret their role in the university leadership team as less one of directing the faculty, department heads, or fellow academic administrators and more one of communicating, negotiating, inspiring and, yes, regulating—as, Janus-like, these deans seek to protect and enrich the graduate experience in light of all the challenges I have described.

Again, how well are our universities responding to the policy challenges to graduate education in science and engineering today? As the president of the Council of Graduate Schools, I am at the hub of the graduate dean community. From this vantage point I can attest to the fact that on all four challenges discussed, our graduate deans are actively engaged. But they can't do this job alone. Here in Kansas, at this gathering of administrators, key research faculty, and legislative directors, you have brought together what for the Midwest are many of the major stakeholders, and thus many of those whose reflection, input and resolve is required to craft a powerful and effective response for Midwestern universities and perhaps for the nation. I am delighted to be with you today as we begin together to take up the challenges that lie ahead.