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Professional Development for Graduate Students: Reflections on the Demands, the Resources, and the Skills

Introduction

For more than a decade graduate students have been telling us that in addition to preparation in research and scholarship in their disciplines, they also feel that graduate schools should make available professional development opportunities for careers both inside and outside of academe. (Golde, C.M. & Dore, T.M., 2001). Some readers of *GradEdge* also remember that last year, in an essay on the graduate dean's kaleidoscope, I placed professional development of graduate students as one of the four key issues on the "inner circle" of graduate deans' concerns. This year we continue to hear from a variety of sources that professional development skills are critical to our graduates' success; we are also increasingly hearing that graduate schools are under considerable stress to reduce "nonessential" activities in their offices. Juxtaposing these two realities leads me this year to think through the question of whether or not professional development, beyond core preparation in the discipline, is a wise expenditure of resources in times when all of our graduate schools are being asked to do more with less.

The first question is: what is the evidence for believing that providing programs designed to strengthen the professional skills and abilities of graduate degree holders is a worthy investment? If they are needed, the second question is: how might graduate schools think about funding these programs on such a scale that their impact can be felt across graduate units and graduate programs? Finally, if these programs are needed and potentially fundable, a third key question relates to substance: which particular kinds of professional skill development programs and opportunities are needed to respond to the career demands of future graduates? Is it possible to craft specific professional development opportunities to respond to the empirical realities of different career tracks? In other words, in times of tight resources, how should the new investments be deployed?

It is these three questions—what is the demand, how can resources be mobilized to meet it, and which skills are important—that we must address. This is critical if professional development is to become a fully effective and integral part of advanced academic training at both the master's and doctoral levels.

The Evidence for Demand

To determine what seems to be missing in current graduate training we might first consider a series of recent national reports that converge around a set of recommendations designed to enhance the quality of graduate training by strengthening the "professional development" aspect of that training.

In June 2012, the National Academy of Sciences released a congressionally requested report, *Research Universities and the Future of America*, which called directly for universities to strengthen the preparation of graduates for careers both within and beyond the academy. The same month, the Biomedical Research Workforce Working Group, appointed by the Director of NIH,

CONTINUED ON NEXT PAGE

Inside

issued a report calling for the creation of a program to supplement its training grants to provide additional training and career development in areas such as project management and entrepreneurial skills. In December 2012, the American Chemical Society issued a report calling on universities to focus more on enhancing the preparation of chemistry graduate students for careers after graduate school. And through the fall of 2012 and spring of 2013 the Graduate Education Modernization Working Group, convened by the Office of Science and Technology Policy in the executive branch, worked to promote multi-agency efforts in the federal government to support professional development of STEM doctoral students and their preparation for diverse careers, including those outside of academe.

All of these national efforts echoed a message delivered initially in a report issued by CGS and ETS in April of 2012 titled *Pathways Through Graduate School and Into Careers*. The blue ribbon advisory committee that oversaw this research project called on government, industry and universities to work together to collectively foster the development of appropriate professional skills that would better prepare students for the careers they ultimately pursue.

Then, in the spring of 2013, perhaps the most compelling voices calling for attention to career development was heard—the voices of students themselves. Their voices came through in an enthusiastic response to a "Challenge" supported by the Division of Graduate Education at NSF, which invited STEM graduate students to offer innovative ideas to improve graduate education. They were asked to identify an issue in graduate education, propose an idea or solution and explain how the idea would change graduate education for the better. The response was impressive: 534 teams submitted ideas. And of the responses to the Challenge, nearly 40% of the submissions identified improvement needed in the key aspects of professional development, including collaboration skills and communication skills.

It was important, and telling, that students themselves join the circle of stakeholders and experts calling for graduate schools and graduate programs to broaden the traditional thinking about graduate training, asking for direct preparation in those skills beyond the narrow discipline that would contribute toward a successful professional career. But none of these advocates for change offered specific suggestions about how such value added to graduate programs might be financed.

The How: Where will the resources be found to fund new professional development programs?

As CGS deans know well, now is not a good time to be identifying activities for which new funding is required in America's graduate schools. But for two reasons I think now is the time to act on the strong recommendations voiced by the stakeholders described above. The first is that professional development as a component of graduate training is not entirely new to graduate schools.

In some cases the professional development activities are already operated out of the graduate school for the benefit of a broad spectrum of students, across many or all degree programs. Some examples that we have featured at recent CGS meetings include activities that foster leadership skills through curricular, co-curricular and experimental programs like those currently underway in the graduate schools at Cornell and the University of California at Santa Cruz. Communication and cooperation skills, also strongly cultivated as an important dimension of professional development, were recently featured in presentations by staff from McMaster and Stony Brook universities where improvisation is used to improve student capabilities in both domains. And at Michigan State, the graduate school has designed a program, PREP, to assist students in transitioning to careers in the public and private sectors. PREP emphasizes four skills: planning, resilience, engagement, and professionalism. While as yet we do not have a complete inventory of such programs, we know anecdotally that they exist. Even in these times of considerable financial stress in many of our institutions, resources are being found in some places or reallocated to address the professional development needs of students.

In other cases, professional development is built into the design of the curriculum as happens in many MBA programs and very intentionally in the construction of the Professional Science Master's (PSM) programs, fostered by our graduate schools over the last decade. In the PSM case, the now 300 programs located in 137 CGS member universities all include a set of "plus" courses selected specifically to ensure that the graduates of these programs will be fully effective not only in the scientific but also in the managerial components of their jobs.

The second reason now is the time to actively consider careful expansion of professional development aspects of the graduate curriculum is that there are some signs that the federal funders are hearing the call for action reflected in the set of reports inventoried above. The American Chemical Society report specifically called on federal agencies to decouple more student support funds from specific research projects to better balance research with training in other career skills. And the NIH Taskforce advised that NIH should create a program to supplement training grants that would provide additional training and career development, mentioning specifically project management and entrepreneurship as needed skill sets.

But we know that funding follows only when references to strategies for funding these activities begin to appear in federal budgets and there is some promising movement on this front. The FY14 NSF proposed budget shows promising signs in its language around the signature programs—the National Graduate Research Fellowship (NGRF) and the new National Research Training (NRT) framework for future programs. One key evaluation criterion for investments in both areas of graduate support is the extent to which they prepare students for a range of career options and potential changes in career paths. As is appropriate from NSF, this is highly non-directive in the specifics, but the broad direction is clear—those with these types of NSF funding must think broadly about the kinds of professional preparation student recipients will need, beyond the focused, research training traditionally supported by NSF. This budget document calls specifically on the new NRT programs to encourage much stronger and documented efforts at innovation and new design in graduate programs.

As this mandate from NSF begins to be implemented operationally, questions will inevitably arise about what specific types of experience, courses, and opportunities actually contribute to the "right kinds" of innovations for particular students enrolled in particular degree programs. In other words, if money is to be spent by universities through their own resources or by federal graduate education funders, what kinds of skills and experiences do we want particular courses of study to include?

Which professional skills are needed and for whom?

One interesting characteristic of the now almost relentless calls for professional development in graduate education is the fact that, to date, the specifics of the curriculum sum up to little more than a lengthy laundry list of courses and workshops or experiences that some institutions at some time offered to graduate students. But what is lacking, and what will be needed in order to make the case for resourcing these activities going forward, is a much more refined understanding of "which skills are required for which programs?" At this stage we are far from being able to answer that question. Moving to the next stage will require a focused inquiry on three fronts.

First we need to understand, well beyond anecdote, what our member universities are now doing to create professional development opportunities for their students. We have some data on the scope of Preparing Future Faculty and similar programs nationally and have reliable data on the scope of Professional Science Master's degree programs. But there is currently no source of information on which institutions have programs in place for the professional development of graduate students in areas beyond those addressed by these grant-funded graduate reform initiatives. The first step, then, would be to identify what programs already exist and obtain information about such things as: their goals and objectives, how are they structured and funded, where they are housed, who participates, how they are assessed, and what evidence we have of their effectiveness.

Next, with that information in hand we need to juxtapose the perspective of employers, graduate degree holders who have been in the workforce for a decade or more and graduate dean leaders in professional development programming to ascertain if there are common perspectives about a set of professional skills that are desirable. We must also aim to understand, in a preliminary way at least, how perspectives diverge on what is needed and how that divergence varies by field of study and workforce sector. Specific core questions that need to be addressed include, for example: What are the skills that graduate students most need for success in the 21st century research workforce (academic and non-academic)? What are the real skills gaps, and how do these differ by field? Are terms such as "competencies," "transferable skills," and "soft skills" sufficient, or do they limit our effectiveness in providing the skills students need? Where are these skills best acquired: in centralized, department or program-based, and/or hybrid programs? And, amid all of these questions, what is the role of the graduate school and graduate dean in motivating the identification, teaching and assessment of these skills?

This background work will provide CGS with a rich description of the skills that are perceived by stakeholders as necessary for success in the 21st-century workforce. It will also give us some sense of deans' opinions about structures that are believed to work. With this information in hand, and if graduate schools are viewed as the right location for leadership on issues of professional development, as has already happened in many institutions, the next step for CGS might be to launch a best practice study. This study would aim to ascertain what particular models, institutional arrangements, and strategies of matching professional development training with specific degree program objectives and career outcomes work best. As with all large CGS best practice projects, there would be a Request for Proposals issued to all CGS members to participate and the project would be conducted with and through the CGS membership.

Moving Forward

I began this essay recounting the broad spectrum of "friends" of graduate education, and students themselves, who have called for career enhancing professional development programs. I have also described what is in place and have acknowledged that there are many worthy competing claims for scarce resources in our universities today. The optimal outcome of our professional development programming efforts at CGS could be a set of actionable recommendations to inform both the federal funders and our member universities on how professional development might best be implemented to strengthen the career outcomes of all graduate degree holders. With this information in hand, putting money on well-crafted professional enrichment opportunities for graduate students may be one of the best bets out there for the long term cultivation of America's most advanced human capital.

By Debra W. Stewart, President, Council of Graduate Schools

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Data Sources: Trends in NSF Graduate Research Fellowship Award Offers (2000-2013)

The National Science Foundation's Graduate Research Fellowship Program (GRFP) has supported more than 46,500 graduate students since 1952.[1] The program's two goals are to select, recognize, and financially support individuals early in their careers who have the demonstrated potential to be high achieving scientists and engineers, and to broaden participation in science and engineering of underrepresented groups, including women, minorities, persons with disabilities, and veterans. The fellowship provides an annual stipend (currently $32,000), and a cost-of-education allowance to the graduate institution ($12,000 in lieu of required tuition and fees) for up to three years of support during a five year fellowship period. Professional development opportunities include support for international research collaborations in partner countries through Graduate Research Opportunities Worldwide.[2] Fellows must enroll in a university, college, or non-profit academic institution of higher education that is both accredited in and has a campus located in the United States and which offers advanced degrees in science and engineering.

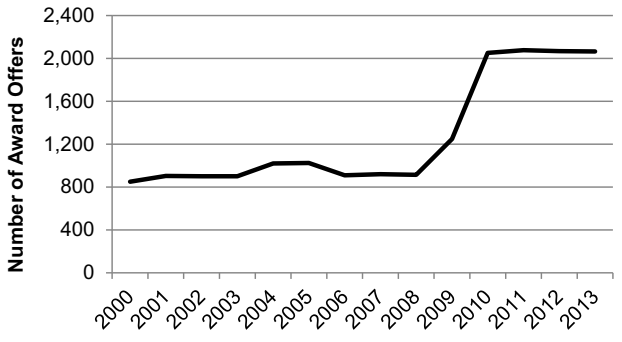
In 2012, 16% of GRFP awardees were from underrepresented minority populations, and over 50% of GRFP awardees were women.[3] Between 2000 and 2008, the number of GRFP award offers was relatively steady, ranging from a low of 850 in 2000 to a high of 1,024 in 2005 (see Figure 1). Between 2008 and 2010, however, there was a substantial (125%) increase in the number of award offers, from 913 to 2,051, to meet the presidential priority of providing 2,000 GRFP fellowships starting in 2010.

Despite the increase in awards, the percentage of award offers by field of study has remained relatively stable, with individuals in engineering and life sciences receiving, on average, 56% of the total GRFP award offers in a given year (see Figure 2). The remaining 44% of award offers are distributed among 10 GRFP fields of study, two of which (Materials Research and STEM Education & Learning Research) were added over the past three years. According to NSF GRFP staff, the number of awards in each field of study has historically been proportional to the number of applications received. These data would suggest that the GRFP is well-known within the engineering and life sciences disciplines, but is not as widely known within the other disciplines.

Prior to 2008, GRFP awardees hailed from an average of 252 different baccalaureate institutions per year, and the pool of proposed graduate institutions averaged 119 different institutions each year. Since 2008, however, the pools of baccalaureate institutions and proposed graduate institutions have widened substantially. In 2013, GRFP awardees hailed from 438 baccalaureate institutions and indicated 167 different proposed graduate institutions. When baccalaureate institutions were ranked based upon the total number of awardees from their institutions, the share of GRFP award offers to individuals from baccalaureate institutions ranking in the top 10 decreased from 32% in 2008 to 23% in 2013 (see Figure 3). Harvard University, Massachusetts Institute of Technology, and the University of California-Berkeley have ranked in the top five of baccalaureate institutions with their graduates receiving the most GRFP award offers since 2000, while Stanford University ranked within the top five for 12 of the past 14 years, and Cornell University has ranked within the top five for 10 of the past 14 years.

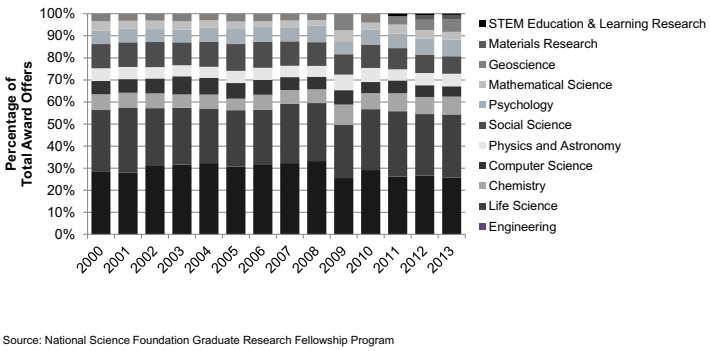
When proposed graduate institutions were ranked based upon the total number of individuals receiving GRFP award offers, the share of GRFP award offers to students planning to attend graduate institutions ranking in the top 10 decreased from 51% in 2008 to 42% in 2013 (see Figure 3). Harvard University, Massachusetts Institute of Technology, University of California-Berkeley, and Stanford University have ranked in the top five proposed graduate institutions

Figure 1: Number of Graduate Research Fellowship Program Award Offers (2000-2013)[4]



Source: National Science Foundation Graduate Research Fellowship Program

Figure 2: Graduate Research Fellowship Program Award Offers by Field of Study (2000-2013)[5]



Source: National Science Foundation Graduate Research Fellowship Program

receiving the most students with GRFP award offers since 2000.

Considering that individuals proposing to attend graduate programs in engineering and life sciences consistently receive the largest share of GRFP award offers, we examined the percentage of award offers by discipline at the baccalaureate and proposed graduate institutions with the number of individuals with GRFP award offers in 2013. Within the group of baccalaureate institutions, the share of GRFP award offers to students in engineering and life sciences programs ranged from 40% at Massachusetts Institute of Technology to 72% at the University of Texas, Austin. Harvard University was the one outlier where only 25% of the GRFP award offers were to individuals proposing engineering and life sciences programs, and 56% of the award offers were to individuals proposing physics and astronomy (18%), chemistry (15%), psychology (13%), and mathematics (10%) programs. Within the group of proposed graduate institutions, the share of GRFP award offers to students in engineering and life sciences programs ranged from 47% at the University of California, Berkeley to 69% at Duke University.

These institutional trends would suggest that the GRFP program is promoted widely at these institutions, and perhaps more widely within the life sciences and engineering programs than in other disciplines. However, since an application database is not available, it is difficult to compare trends in applications and award offers by field of study, baccalaureate institution, and proposed graduate institution. Nevertheless, the increase in GRFP awards over the past few years, the trends in the number of awards to women and underrepresented minorities, as well as the increasing number of institutions (both baccalaureate and proposed graduate institutions) associated with students receiving GRFP award offers indicate the program is reaching a wider group of students and institutions, and broadening participation in STEM disciplines.

More information about the NSF GRFP can be found at http://www.nsfgrfp.org.

Thank you to Gisele Muller-Parker and others at the National Science Foundation for their contribution and review of this article.

By Leila Gonzales, Manager of Surveys and Information Services and Jeff Allum, Director, Research and Policy Analysis, Council of Graduate Schools

References:

[1]NSF GRFP Program Information: www.nsfgrfp.org/60th_anniversary_grfp/

[2]Graduate Research Opportunities Worldwide (GROW): www.nsf.gov/grow/

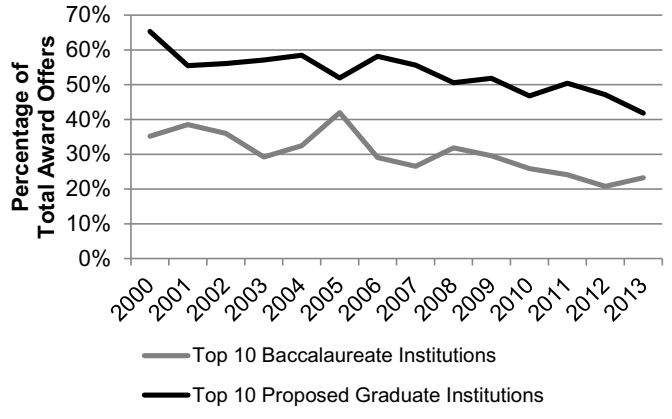
[3]See reference 1.

[4]All data retrieved from the NSF Fastlane website: www.nsf.gov/fastlane/grfp/

[5]Ibid.

[6]Ibid.

Figure 3: Share of Graduate Research Fellowship Program Award Offers by the Top 10 Baccalaureate and Proposed Graduate Institutions (2000-2013)[6]



Source: National Science Foundation Graduate Research Fellowship Program

Henning Schroeder Named CGS/NSF Dean in Residence for 2013/2014

CGS is pleased to announce that Henning Schroeder joined CGS and NSF on September 3rd and will work with the two organizations through July 2014.

Schroeder became Vice Provost and Dean of Graduate Education at the University of Minnesota in 2010, and previously served as Associate Dean for Research and Graduate Studies in the College of Pharmacy. He holds a faculty appointment as professor in the Department of Pharmaceutics.

Between 2005 and 2007 he was a visiting professor in the Department of Pediatrics at Stanford University School of Medicine. He served for 12 years as chair of the Department of Pharmacology at Martin Luther University School of Pharmacy in Halle, Germany, and prior to that he was a faculty member in the Medical School at Duesseldorf University.

Schroeder earned both his Ph.D. (1985) and professional pharmacy degree (1981) from Duesseldorf University. He was a postdoctoral fellow at Stanford University where he worked in the lab of Nobel laureate Ferid Murad. Schroeder's research has focused on cardiovascular disease and the regulation of antioxidant genes. His work and that of his graduate students has been recognized with numerous national and international awards.

The Dean in Residence program was created by CGS and the National Science Foundation (NSF) to support communications between senior graduate education leaders and the NSF. In this role, Dr. Schroeder will share with CGS and NSF the insights, perspectives, and practical experience of a senior administrator at a research university, while collaborating with program officers and senior administrators across NSF to help plan future NSF programs and activities.

CGS New Deans Institute and Summer Workshop a Great Success!

The 2013 New Deans Institute and Summer Workshop in San Juan proved to be another highly successful meeting. The 240 registrants attended three plenary sessions, four Dean Dialogues and twelve Hot Topic sessions covering topics ranging from graduate education and the public sphere, graduate student leadership, building international networks and the role of MOOCs in graduate education. The opening dinner and reception and several networking lunches provided attendees the opportunity for much discussion and interaction.

We would like to thank the CGS Board, meeting presenters and the following sponsors for helping to make the meeting a success: Educational Testing Service and ProQuest Dissertations Publishing. We would also like to thank the following member institutions for their support in sponsoring the refreshment breaks: Arkansas State University, Iowa State University, Polytechnic University of Puerto Rico, Texas A&M University, The University of Texas Graduate School of Biomedical Sciences at Houston, Texas Christian University, University of Iowa, University of Minnesota, University of Nebraska at Kearney, University of Nebraska Medical Center, University of North Texas, University of Texas Medical Branch and Washington University in St. Louis.

PowerPoint presentations from the meeting can be found on the CGS website at www.cgsnet.org.

New Members

Regular:

Columbus State University

North Central College

John Jay College of Criminal Justice, CUNY

Northcentral University

Associate:

Kansas City University of Medicine and Biosciences

Corresponding Affiliate:

Tennessee Board of Regents System Office

CGS Welcomes New Staff

Hironao Okahana joined the Council of Graduate Schools in August 2013 as Research Associate. Primarily, Hiro is supporting research efforts pertaining to the Doctoral Initiative on Minority Attrition and Completion (DIMAC).

Hiro recently finished his dissertation study titled, "Shifting demand or just moving price?: A multi-level analysis of student price demand for college education and state policy preferences" and earned his Ph.D. in Education from the University of California, Los Angeles (UCLA). While at UCLA, he worked as a teaching assistant for several courses, including: Higher Education Policy, Higher Education Finance and Organizational Analysis in Higher Education.

Originally from Tokyo, Japan, Hiro also holds an M.A. in Education and Master of Public Policy degrees from UCLA, and undergraduate degrees from California State University, Long Beach. Previously, he worked as Policy and Strategy Analyst for the Associated Students, California State University, Fullerton, Inc.

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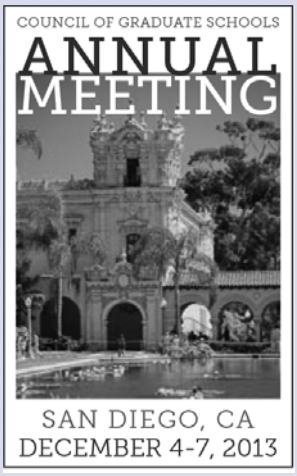

Join us for the CGS 53rd Annual Meeting at the Hotel del Coronado in San Diego!

Guest speakers include: Dan Ariely, Daphne Koller, Chris Edley, and James Fowler

Twelve pre-meeting workshops, six plenaries and 16 concurrent sessions

For more information, visit the CGS website at www.cgsnet.org.