NSF Support of STEM Graduate Students: What Works? What’s Needed?
CGS Summer Workshop
Hot Topics Session
July 15, 2013

Summary of Written Responses (37 questionnaires returned)

I. From the perspective of your institution’s graduate education portfolio and priorities, comment on NSF programs and funding mechanisms supporting STEM graduate students (Fellowships, Traineeships, Research Assistantships):

A. What works?

- Support of interdisciplinary programs and transferable skills development in traineeships (e.g. IGERT). (13)
- Fellowships (GRF) - great students, good program flexibility, attentive to diversity concerns. (11)
- Research assistantships (RAs) that link students to NSF sponsored research projects. (5)
- Fellowships encourage domestic students to pursue graduate school and STEM careers.
- NSF funding is critical in an era of greater stresses on subsidized loan programs and increasing undergraduate student debt.
- Extended duration NSF projects are great in sustaining support of graduate students and their engagement in multidisciplinary efforts (e.g. SEES, PIRE, IGERT).
- NSF funding helps enhance degree completion and reduce attrition in graduate programs.
- NSF funding supports national needs and workforce development.
- NSF Innovation programs (I-Corps, PFI, SMP).
- Blended opportunities that include individual fellowships and institutionally-administered programs.

B. What’s needed?

1. Graduate Student Professional Development/Traineeships/Internships

- Increased traineeship opportunities to enhance mentoring and professional development including transferable skills for all NSF supported students. (5)
- Proposed internship program is a good idea but will be hard to implement at the institutional level without support for cultivating opportunities and making appropriate placements. (3)
- Promote national labs (e.g. DoE) in internship opportunities and provide incentives for faculty to encourage their students to do graduate internships.
- More training emphasis for RAs and fellows. (2)
• A successor to GK-12 is needed to enhance community connections.
• Expanded traineeship and fellowship programs.
• Expanded access to government (national) labs, scientists and resources to augment graduate education programs.
• Transparency on new directions in NSF traineeships and fellowships.
• Support for institutionalization of effective practices developed under IGERT.
• Allow small grants for “expiring” IGERTs to expand professional development opportunities to broader community.
• Reconsider limited submissions constraints on traineeship proposals. (2)
• Future NRT stipends for trainees should be aligned with institution/departmental salaries.
• Enhance the Cost of Education allowance to reduce stresses on institutional budgets and cover tuition costs. (2)
• Add professional development modules to NSF Center grants.
• Bring back IGERTs.
• Multi-agency coordinated training and career development programs through co-solicitations or shared budgets, for example in “convergence areas” involving intersections of physical, biological and computer sciences. (2)

2. Graduate Fellowships

• Provide more guidance to institutions that don’t encourage students to apply for GRFs- tips on effective practices and how to engage faculty would be helpful. (2)
• Expanded traineeship and fellowship programs.
• Transparency on new directions in NSF traineeships and fellowships.
• Better flow of information to institutions about GRF applicants and incoming fellows to their institutions.
• More consistent institutional treatment of GRFs vs. RAs, including issues related to benefits and health care coverage.
• Enhance the Cost of Education allowance to reduce stresses on institutional budgets and cover tuition costs. (2)
• GRFP should be better integrated with an institution’s doctoral research programs.

3. Graduate Research Assistantships (RAs)

• Enhance RAs through addressing continuity of funding, encouraging interdisciplinary experiences, improved policies on sick leave and family issues.
• More investment in research experiences for students beyond the first two years.
• Stimulate early entry of graduate students into research (e.g. $3K grant to encourage work in summer before formal entry into graduate program).

4. Masters Institutions and PSM Programs
• More support for Professional Science Masters (PSM) programs and participants. (2)
• Expanded internship opportunities, including PSM students. (2)
• More diversity in allocation of funds to include smaller institutions and enhance their graduate programs. (2)

5. Other

• More attention given to doctoral education in light of the escalating number of post-docs in many STEM fields. Does the growing need for a postdoc reflect a failure in doctoral training?
• Continue to provide incentives to enhance international opportunities. (2)
• Keep attending to social sciences, and find new ways to integrate social and natural sciences. (2)
• Improve tracking of programs on an annual basis with assistance of the Graduate School.
• Broaden the scope of STEM programs to include areas such as forensic science or architecture. (3)
• Enhance support for interdisciplinary ventures, including traineeships and fellowships. (2)
• Provide campus-wide training to build knowledge of NSF graduate funding opportunities.
• More information on graduate awards by type of institution, region, gender, ethnicity.
• More discussion of the role of faculty mentorship and the role of the Graduate School in supporting NSF programs.
• More industry and private partners in graduate funding. (2)
• NSF should consider programs similar to NIH’s efforts with the new BEST program or NIH NRSA fellowships.
• Funding timelines that allow for the full development of the student (3-5 years).
• Enhance the funding levels for Doctoral Dissertation Improvement Grants (DDIG).

II. In a national context, suggest key policy and program changes for NSF to consider in addressing needs for STEM graduate student support or graduate education more generally:

A. Policy changes?

1. Graduate Student Professional Development/Traineeships/Internships

• More policies to encourage professional development opportunities and better preparation for non-academic careers. (3)
• Partner with NIH on the new BEST program to promote innovations in training.
• Encourage training in non-training grant programs.
• Require a graduate student mentoring plan on all grants to encourage faculty engagement in broader training.
• Assist institutions in tracking career success and outcomes.
• STEM training should balance inter- and intra-personal skills.
• Require site visits for review of traineeship proposals.
• Align internship initiatives with existing IUCUC portfolio.

2. Graduate Fellowships

• Stipend levels for GRF should not be increased or even reduced. It is better to offer more awards or increase Cost of Education allowance. (5)
• Broaden definition of STEM and eligibility requirements for NGRF (e.g. allow Masters recipients to apply).
• Clearer description of motivations and goals for new NGRF proposed by CoSTEM, including framework for associated internships.
• Shift GRF awards from individuals to institutions to provide more “bang for the buck”.
• Convert GRF from three to two-year awards to enhance funding for more fellows or traineeships.
• Enhance the regional balance of GRFP awardees and clarify priority areas for NSF funding.
• Develop mid PhD career fellowships.

3. Graduate Research Assistantships (RAs)

• Require elements addressing professional development in RAs.
• Encourage PIs to include RA support in all proposals and to have review panels support the investment.

4. Masters Institutions and PSM Programs

• More emphasis on funding Masters-focused institutions. (4)
• Enhance focus on Master’s level education in STEM. (2)

5. General Financial Policies

• NSF should give fewer “megagrants” for large scale projects and smaller awards to support more institutions and “incremental” research.
• More consistent policies on cost of education/tuition reimbursements.
• More policies and associated funding to encourage graduate student exchanges internationally. (2)
• Require institutional commitments to assure sustainability of initiatives.
• Cost of graduate students becoming similar to postdocs. PIs have difficult choices in trying to support graduate education without appropriate incentives.
Encourage industry co-funding of graduate student programs. (2)  
Target junior faculty who need graduate student support early in their tenure track years.

6. Other

- Policies to encourage PIs to have diverse teams. (3)  
- Policies need to be more consistent across NSF Directorates.  
- More thought should be given to when students are eligible for support, such as for the new traineeships. For example, link eligibility to academic milestones such as completion of preliminary exams.  
- Criteria for Dissertation Research Awards vary dramatically between programs.  
- Enhance accountability and tracking of outcomes of NSF support.

B. Program changes?

1. Graduate Student Professional Development/Traineeships/Internships

- Internships are a good idea to meet national priorities, but may be difficult to have faculty support if it impacts research productivity. Issues include student recruitment, timing, cost to research progress, conflicts with other appointments. (3)  
- More emphasis on graduate student training and mentoring. (2)  
- Enhance opportunities for the professional development of faculty members.  
- Preserve integrative and interdisciplinary aspects of IGERT in the proposed NRT.  
- NRT should continue IGERT’s spirit of risk-taking, encourage multi-agency connections, and push the boundaries of disciplines.  
- Launch programs supporting Graduate School efforts to enhance professional development activities.  
- Support campus-wide STEM training grants.  
- Enhance institutional programs that are administered centrally to meet the needs of graduate training as career options evolve.  
- Broaden STEM experience to international experiential learning.  
- Create templates for internship agreements/programs/MOUs to help protect the students and the partner organizations and address issues such as IP. (2)

2. Graduate Fellowships

- Establish national conference of fellows similar to Ford Foundation efforts to build networks.  
- Mandatory leadership/career development for fellows.  
- Consolidation of programs (NGRF) is a good idea.
3. **Diversity and Inclusiveness**

- Maintain “Alliances” programs to enhance diversity and do more to disseminate results and best practices.
- Need more NSF programs and policies that promote diversity.

4. **Other**

- More training programs to assist faculty and institutions in proposal development and raise their competitiveness for support. (2)
- Help graduate advisors and heads of graduate study to develop programs.
- Closer integration between REUs and student entry into graduate schools to speed involvement in graduate research.
- Encourage partnerships between NSF and NIH’s BEST program, and in areas at the interface of the physical and life sciences.

R. Linton / July 22, 2013