



National Science Foundation

4201 Wilson Boulevard
Arlington, Virginia 22230

Research and Evaluation on Education in Science and Engineering (REESE)

Dear Colleague:

On behalf of the Division of Graduate Education (DGE) in the Directorate for Education and Human Resources (EHR) we call your attention to an opportunity to request support for research and evaluation projects focused on graduate education. This opportunity is embedded in a program titled *Research and Evaluation on Education in Science and Engineering* (REESE) managed by the Division of Research, Evaluation, and Communication (REC) in EHR. The REESE Program Solicitation (NSF 06-609) can be viewed at:

<http://www.nsf.gov/pubs/2006/nsf06609/nsf06609.htm>

DGE seeks proposals that have the potential to strengthen graduate education in science, technology, engineering, and mathematics (STEM). As examples, we encourage proposals that can contribute to our knowledge about how to successfully broaden participation in graduate-level education programs and proposals that investigate new trends and challenges in graduate STEM education. Successful proposals will demonstrate expertise in both the disciplines being studied and research methodology. In principle this can be achieved by selecting a team of co-PIs that bridge knowledge of STEM disciplines with expertise in education research or social science research methods.

We seek to build a research community that can more effectively address current issues, trends and questions in STEM graduate education, such as:

- How to increase participation by able students in STEM graduate education;
- Efforts to improve the retention and graduation rates of STEM graduate students;
- The impact of increased mentoring on the success of graduate students;
- Emerging STEM research fields, particularly cross-disciplinary ones;
- Changes in skills expected for STEM professionals and how these are communicated to graduate programs;
- The effects on graduate education of growing international cooperation in research and education;
- Uses of new technologies (including new cyber infrastructure developments) in both education and research;
- The speed of diffusion of new methods of graduate education, or the diffusion of new programs in emerging STEM disciplines; and
- Advancing the understanding of the causes and effects of progress in and barriers to broadening participation in STEM graduate education.

The following NSF-supported projects are representative of the current education research portfolio in graduate STEM education:

Robert Tai (University of Virginia), *Project Crossover: A Study of Transition from Student to Scientist*, NSF award 0440002. This is a study of the training of new scientists with a focus on the maturation and growing independence of graduate students during their years in graduate school. See: <http://www.nsf.gov/awardsearch/showAward.do?AwardNumber=0440002>

Rachel Scherr (University of Maryland), *Developing Conceptual and Teaching Expertise in Physics Graduate Students: An Integrated Approach*, NSF award 0529482. Little research on TA training has focused on the specific nature of the challenges. This project details the expectations, attitudes, and epistemologies of graduate teaching assistants towards educational reform. It is developing a learning environment to test whether they can effectively learn how to become more effective teachers. See: <http://www.nsf.gov/awardsearch/showAward.do?AwardNumber=0529482>

Connie L. McNeely, Jong-on Hahm, David H. Kamens (George Mason University), *Institutional Diffusion and Organizational Impacts on STEM Women in Higher Education*, NSF award 0633950. This study will investigate the institutional diffusion of policies and practices aimed at increasing the number of women in the various science, technology, engineering, and mathematics (STEM) fields in U.S. universities. While the study builds upon previous efforts directed at individual and career level outcomes, this study will examine institutional level changes and effects relative to gender diversity in graduate education and the STEM professoriate. See: <http://www.nsf.gov/awardsearch/showAward.do?AwardNumber=0633950>

We encourage both synthesis projects (e.g., workshops, exploratory research, planning and design projects) for durations of one to three years not to exceed \$200,000 and larger empirical projects for durations of three to five years with project budgets up to \$1 million. The synthesis projects will permit investigators to develop rigorous research designs, techniques, and methods and to forge partnerships with researchers representing appropriate disciplines and areas of expertise. Proposers should review the REESE Program Solicitation to ensure that eligibility requirements are met.

Investigators are encouraged to contact DGE program officers to discuss graduate topics of interest, and REESE program officers listed in the REESE Program Solicitation to discuss research approaches and requirements of the REESE program.

DGE Program Officers:

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REC/REESE Program Officers:

- John Cherniavsky: (703) 292-5136, jchernia@nsf.gov
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We look forward to reviewing innovative and competitive proposals.

Sincerely,

Myles Boylan, Acting Director
Division of Graduate Education