



National Science Foundation  
4201 Wilson Boulevard  
Arlington, Virginia 22230

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

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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 the Research and Evaluation on Education in Science and Engineering (REESE) program managed by the Division of Research on Learning in Formal and Informal Settings (DRL) in EHR. The REESE Program Solicitation (NSF 07-595) can be viewed at: <http://www.nsf.gov/pubs/2007/nsf07595/nsf07595.htm>

DGE seeks proposals that have the potential to strengthen research on 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 the effectiveness of 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 can we improve the retention and graduation rates of STEM graduate students?
- What is the impact of increased mentoring on the success of graduate students?
- What are the implications for student learning that emerge from STEM research fields, particularly cross-disciplinary ones?
- What changes in skills are expected for STEM professionals and how these are communicated to graduate programs?
- What are the effects on graduate education of growing international cooperation in research and education?
- What are uses of new technologies (including new cyber infrastructure developments) in both education and research?
- What factors influence the speed of diffusion of new methods of graduate education or the diffusion of new programs in emerging STEM disciplines? and
- How can we advance 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:

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>

Bianca Bernstein (Arizona State University), CareerBound: Internet-Delivered Resilience Training to Increase the Persistence of Women Ph.D. Students in STEM Fields, NSF award 0634519. The study is addressing the question of whether deliberate resilience training delivered via the Internet can strengthen women doctoral students' persistence in physical sciences, engineering and mathematics, fields where women display high rates of attrition even as their numbers in doctoral programs have continued to rise. An internet-based, multimedia-enhanced program is being developed and evaluated for its effectiveness in reducing attrition and strengthening career aspirations and personal skills of female doctoral students in selected fields at multiple universities. Grounded in the literatures of career development, self-efficacy, and empirically supported interventions and instructional tools, the set of personal and psychosocial skills are addressed as "resilience skills" and the psycho-educational strategy to strengthen these skills as "resilience training." See:

<http://www.nsf.gov/awardsearch/showAward.do?AwardNumber=0634519>

Maresi Nerad (University of Washington), Forces and Forms of Change in Doctoral Education Worldwide II: A Research Synthesis Workshop, NSF award 0701317. This synthesis workshop is addressing a critical issue facing STEM graduate education – worldwide changes in the forces and forms of doctoral education. The synthesis project is part of a multi-year project to establish an international network of leaders in doctoral education research and innovation to synthesize existing research and knowledge in five critical dimensions of globalization in doctoral education. They are: (1) the impacts of globalization in labor markets on doctoral education; (2) the problem of tensions between national interests and global science; (3) the competencies of Ph.D. holders worldwide; (4) the usefulness of existing data for evaluation of doctoral education cross-nationally; and (5) the problem of evaluation and quality assurance as doctoral education globalizes.

<http://www.nsf.gov/awardsearch/showAward.do?AwardNumber=0701317>

Sandra L. Laursen (University of Colorado), Professional Socialization and Career Selection in Ph.D. Science Education: An Empirical Research Study, NSF award 0723600. This project is examining the professional socialization and career choices of

scientists through an in-depth, qualitative investigation of professional socialization in science Ph.D. programs, employing an embedded case study design. This design is structured as a comparative, ethnographic study of science graduate students, faculty, and staff to address the question: "What are the elements and processes of professional socialization- both manifest and latent - by which science graduate students come to understand their profession and their own fit within it, and how do these shape their career selection and progress."

<http://www.nsf.gov/awardsearch/showAward.do?AwardNumber=0723600>

We encourage knowledge diffusion projects (e.g., research syntheses) for durations of one to two years not to exceed \$250,000, empirical projects for durations of up to three years with project budgets up to \$1 million, and large empirical projects for durations of five years and project budgets up to \$2 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.

For further information: (703) 292-8650 or [DRLREESE@nsf.gov](mailto:DRLREESE@nsf.gov)

We look forward to reviewing innovative and competitive proposals.

Sincerely,

Carol Stoel, Acting Director  
Division of Graduate Education