Transforming Institutions, Transforming Science and Engineering

Broadening Participation through Innovations for Institutional and Educational Transformation Workshop
Baltimore, MD, June 1, 2015
Joan Ferrini-Mundy
Assistant Director, NSF
Congratulations and thanks!

• For your work to “address the persistent gender and racial disparities in STEM education and the STEM academic workforce”
• For recognizing the important synergies between the NSF ADVANCE and NSF Research on Gender in Science and Engineering programs
• For advancing the progress of science through diversity
Research on Gender in Science and Engineering  
(launched in 1993)

The Research on Gender in Science and Engineering program supports efforts to understand and address gender-based differences in STEM education and workforce participation through research, the diffusion of research-based innovations, and extension services in education that will lead to a larger and more diverse domestic science and engineering workforce. Typical projects will contribute to the knowledge base addressing gender-related differences in learning and in the educational experiences that affect student interest, performance, and choice of careers; how pedagogical approaches and teaching styles, curriculum, student services, and institutional culture contribute to causing or closing gender gaps that persist in certain fields. Projects will communicate and apply findings, evaluation results, and proven good practices and products to a wider community.
The goal of the National Science Foundation’s (NSF) **ADVANCE** program is to increase the representation and advancement of women in academic science and engineering careers, thereby contributing to the development of a more diverse science and engineering workforce. ADVANCE encourages institutions of higher education and the broader STEM community, including professional societies and other STEM-related not-for-profit organizations, to address various aspects of STEM academic culture and institutional structure that may differentially affect women faculty and academic administrators. As such, ADVANCE is an integral part of the NSF’s multifaceted strategy to broaden participation in the STEM workforce, and supports the critical role of the Foundation in advancing the status of women in academic science and engineering.
Major Contributions, GSE:

Formulation, study and dissemination of critical constructs:
- Stereotype threat
- Spatial visualization
- Mindset
- Unconscious bias
- Role models
- Effective dissemination and outreach models
Major Contributions, ADVANCE:

Research and strategies on:

• Recruitment, promotion, and tenure policies
• Implementation of flexible career policies
• Institutional climate
• Cost benefit analyses
• Mentoring, recognition, professional development
• Tools to address gender equity barriers
FRANCE A. CÓRDOVA: Well, first of all, I used those as examples of discovery science. I wanted to put a focus on NSF's basic mission, which is to further the progress of science. And to illustrate that, I chose, as you pointed out, examples of women scientists doing this. What the National Science Foundation is doing, first of all, is investing in research to better understand this issue and many of the social issues that challenge us today. And we are studying women in science all the way from elementary school through high school, and college and beyond, to understand the nature of the challenges that they face. We have some specific programs that I could call attention to, like our very well known ADVANCE program, which focuses on the advancement of women at the university level in the professoriate in order to understand and help them advance in their careers as women scientists and engineers.
Ongoing Challenges:
Increase participation of women in particular fields—e.g., computer science
Increase numbers of women in leadership positions relative to STEM.

“furthermore, too few women are in leadership positions or involved in decision-making in research. Only 20% of top level academics are women, and just one in every ten universities in the European Union has a female rector.”

Increase influence of women in the formulation and pursuit of scientific questions.

https://genderedinnovations.stanford.edu

Londa Schiebinger

**Gendered Innovations** harness the creative power of sex and gender analysis to discover new things.
The peer-reviewed Gendered Innovations project:
   1) develops practical methods of sex and gender analysis for scientists and engineers;
   2) provides case studies as concrete illustrations of how sex and gender analysis leads to innovation.
**Improve retention of women to full professor ranks in STEM.**

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Source: NCSES, CRA, ASEE, NCSES, NCSES, NCSES, NCSES, NCSES.
WHAT IS NSF DOING?
INCLUDES: Inclusion across the Nation of Communities of Learners that have been Underrepresented for Diversity in Engineering and Science

➢ A multi-year, comprehensive national initiative that is complementary to other Federal diversity efforts in STEM

➢ Goal: To mobilize STEM research, education, and other communities for scalable solutions to broadening participation challenges

$15M in FY16 for INCLUDES
Guiding Principles for INCLUDES

➢ Diversity is a critical driver of excellence in research and innovation in STEM for the 21st Century.

➢ We must improve preparation, participation, advancement, and potential contribution of those that have been traditionally underserved in STEM.

➢ NSF will encourage exploration of novel efforts, for example Collective Impact and/or Catalytic Innovation approaches, for broadening participation.

➢ Existing NSF investments in broadening participation will serve as foundation for the INCLUDES efforts.

➢ INCLUDES will stimulate efforts to implement and monitor scalable approaches that lead to clearly documented impacts on broadening participation.
Building next generation research infrastructure for education research.
“serve as a public justification for NSF funding by articulating how the project serves the national interest, as stated by NSF's mission: to promote the progress of science; to advance the national health, prosperity and welfare; or to secure the national defense”
Big data – new ways of collaborating
Engaging in the national dialogue about reproducibility and robustness of research.
Press Release 15-021
National Science Foundation announces plan for comprehensive public access to research results

Leading the way in open access to the results, data, and products of educational research.