

## Sixth Gender Equality Conference in Stockholm 2009 – Changing the Gender Order

Title: Transforming Universities and Colleges in the United States with Federal Government Support

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Track: Gender Power Order

In 2001, a new program called ADVANCE was created at the National Science Foundation of the United States with the goal of increasing the representation and advancement of women in academic science and engineering careers, by focusing on organizational change of academic institutions. The Institutional Transformation (IT) awards support innovative, comprehensive changes to the formal and informal structures of academic institutions. To be competitive for these awards, universities must: (i) demonstrate commitment for faculty diversity at the highest levels, (ii) report faculty statistics disaggregated by gender, (iii) review institutional policies, procedures and practices, (iv) design effective and innovative strategies to promote gender equality based on the relevant social science literature, and (v) design a thorough social science study of the project and develop an active dissemination plan. The major outcomes from successful awardees are the increased participation and advancement of women in academic positions at their institutions, and a better understanding of the dynamics involved. Sustainable organizational changes that have resulted include: faculty and leadership awareness training; standardized recruitment and hiring processes; transparent and consistent tenure and promotion policies; work-life support programs; and new organizational structures and leadership positions. In addition, archival peer-reviewed journal publications, books and reports, web-accessible resource guides and tools, as well as, a cadre of institutional transformation experts have been developed. Workshops, presentations, and pressure to maintain competitiveness with peer academic institutions have led to broader adoption of these proven practices beyond

ADVANCE IT institutions. The other ADVANCE two program components, IT-Catalyst and Partnerships for Adaptation, Implementation, and Dissemination (PAID), complement the IT program component.

## **I. Background**

The National Science Foundation (NSF) is an independent U.S. federal agency created by the U.S. Congress in 1950. The NSF annual budget is currently about US\$6 billion. The NSF is a significant source of support for the basic research undertaken by U.S. colleges and universities in science and engineering, particularly in fields such as mathematics, computer science and the social sciences. The Science and Technology Equal Opportunity Act of 1980 authorized the NSF to make awards to encourage the education, employment, and training of women and underrepresented ethnic minorities in science and technology in addition to supporting basic research. Since 1982 there have been several NSF programs that have focused on supporting women in science and technology such as: the Visiting Professorships for Women in Science and Engineering program (VPW); the Research Opportunities for Women program (ROW); the Faculty Awards for Women Scientists and Engineers program (FAW); and the Professional Opportunities for Women in Research and Education program (POWRE). In 1999, the NSF Deputy Director established a committee charged with “...recommending creative and viable strategies and programmatic approaches that [NSF] directorates might pursue to increase the advancement of women in the science and engineering faculty ranks, especially at the senior leadership ranks of academe.” This committee developed the ADVANCE program<sup>1</sup> and the first grants were subsequently awarded in 2001. An important distinction between ADVANCE and past NSF programs was an emphasis on the organizational transformation of academic institutions in order to meet the goal of increasing the representation and advancement of women in academic science and engineering careers.<sup>2</sup> This approach was predicated on the social science research on women in science, technology, engineering and mathematics (STEM) faculties which identified organizational and cultural barriers within universities and colleges as significant reasons for the low participation and slow advancement of women in academic careers rather than women’s ability, interest, or technical skills.<sup>3</sup>

## **II. The ADVANCE Program**

The NSF ADVANCE program currently supports three different program components: 1) Institutional Transformation (IT), 2) IT-Catalyst, and 3) Partnerships for Adaptation, Implementation, and Dissemination (PAID). ADVANCE awards are selected via the NSF’s merit review process, which evaluates the intellectual merit and broader impacts of the proposal. To date, thirty-seven universities have received five-year ADVANCE IT awards to implement comprehensive and innovative institutional transformation projects. Eleven institutions have received support under the IT-catalyst component including predominantly undergraduate institutions, four Minority-Serving Institutions and one institution with a significant population of disabled students. Forty-one PAID awards have been made since this program component started in 2005 including the

most recent 2009 PAID awards. Through the ADVANCE program, Leadership and Fellows awards were also made. The Leadership program component is now part of the PAID component, and the fellowships component for individual scientists and engineers was ended in order to allow the ADVANCE program to focus on the institutional transformation program components.

IT projects (US\$3-4 Million over a five-year period) are specifically designed to address the organizational and cultural barriers at universities and colleges that have been identified as impediments to the full participation of women in STEM academics and leadership.<sup>4</sup> The ADVANCE program provides support to institutions to implement activities to eliminate any organizational and cultural barriers within the academic institution in order to establish a positive academic environment for all faculty members. ADVANCE IT projects are comprehensive and include many strategies for institutional transformation and cultural change in addition to educating and empowering decision-makers, such as work-life satisfaction; professional development; and policy review, revision and clarification. ADVANCE IT grantees have discovered that the organizational changes achieved with the ADVANCE projects result in significant improvements in job satisfaction and faculty retention avoiding the high costs of attrition. The first two cohorts of IT grantees (2001 and 2003) either have completed their projects or are in the process of completing them.

The IT-Catalyst projects support institutional self-assessment activities at institutions of higher education, such as basic institutional data collection and analysis, and the review of relevant policies and procedures to provide the necessary foundation to undertake institutional transformation. Piloted in 2008 as IT-Start, this component is intended to increase the diversity of the types of institutions ready to undertake institutional transformation. The PAID component supports a variety of different projects at institutions of higher education and science and engineering professional societies. PAID projects include adapting IT strategies to new institutions; disseminating research, strategies, tools and materials; as well as performing relevant social science research.

### **III. Examples and Outcomes of Institutional Transformation**

The IT projects at the University of Michigan at Ann Arbor (UM) and the University of Wisconsin at Madison (UW) both include activities that focus on educating and empowering decision-makers. The UM peer-to-peer training model focuses on minimizing the effects of implicit bias in decision making of search committees, and promotion and tenure committees. UM's Strategies and Tactics for Recruiting to Improve Diversity and Excellence (STRIDE) committee works with faculty and academic leaders to maximize the likelihood that diverse, well-qualified candidates will be identified and recruited for faculty positions, and, if offered positions, are actively recruited, retained and promoted. The STRIDE committee is composed of male and female senior faculty who are trained on unconscious bias and empowered by the upper administration.<sup>5</sup> UM reported an increase in the percent of women hired in science and engineering tenure-track positions from 14% in 2001 to 34% in 2006. Moreover, the

STRIDE committee model is being adapted at several other institutions that are seeking to achieve institutional transformation.

UW's approach focuses on the critical role that departmental leaders play in setting the local departmental culture. UW's Climate Workshops for Department Chairs are designed to provide chairs the tools and resources needed to identify departmental issues and to develop action plans to address issues. As a result, the departmental leaders become empowered with the skills to utilize climate survey data and to consult their faculty to inform their decision-making.<sup>6</sup> Indicators of the success of the UW project include an increase in female department chairs from two to ten in a three-year period, as well as positive changes in faculty climate surveys with more women faculty reporting that they "fit" in their department and fewer women reporting isolation within their department and UW.

In general, ADVANCE Institutional Transformation awardees have developed and implemented many tactics for addressing the organizational factors that negatively impact women's representation in academic STEM faculty and leadership positions.<sup>7</sup> In addition, many of the ADVANCE PAID and Leadership awards have adapted these strategies to different types of institutions or disseminated related research, strategies, tools and materials to various audiences. Information about ADVANCE institutions may be found at ADVANCE grantee websites, which are linked to the ADVANCE web portal ([www.advance-portal.net](http://www.advance-portal.net)).

In addition to creating a more equitable environment for women, ADVANCE IT awardees have reported several additional benefits of the changes on campus in STEM fields. Specifically, the strategies that work to recruit, retain, and promote women in STEM academic positions also improve the situation for other underrepresented groups such as persons with disabilities and racial/ethnic minorities, as well as for men that now enter the work force with a greater interest in and expectation for work-life balance. Some grantees have made the argument that a cost/benefit analysis of their work-life programs indicates that the modest costs of these programs leads to savings as a result of improved faculty satisfaction and retention. Finally, some institutions that have undertaken transformational activities are discovering that they are more competitive for highly qualified and diverse faculty than peer institutions that have not implemented such activities.

An external program-level evaluation of ADVANCE started in 2008 to evaluate the impacts of the NSF ADVANCE program. Although this evaluation will not be complete until 2011, it is evident from grantee reports and numerous peer-reviewed publications that this institutional transformation approach to addressing gender equity has resulted in the creation of more positive and supportive work environments that increase the recruitment, retention, and advancement of all faculty, including women, men, and underrepresented minority faculty.

## IV. Conclusion

The full participation of women in academic science and engineering careers is important given the pivotal role that faculty members and administrative leadership have as intellectual, professional, personal, and organizational role models that shape the expectations of prospective scientists and engineers in U.S. higher education institutions. The persistent underrepresentation of women faculty, especially in leadership positions, may affect students' critically important relationships with mentors, participation as members of research and education teams, and self-identification as potential researchers. The ADVANCE program is designed to work toward overcoming and eliminating the organizational and cultural barriers that have been identified as reasons for the low participation and slow advancement of women in academic science and engineering careers.

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<sup>1</sup> [www.nsf.gov/advance](http://www.nsf.gov/advance) (accessed July 21, 2009).

<sup>2</sup> L.D. Madsen, *Increasing the Participation and Advancement of Women in Academic Science and Engineering Careers in the United States of America* Proc. 12th International Conf. of Women in Eng. and Science (ICWES) (2002); W.E. Ward, *The success of female scientists in the 21st century, in Gender Equality Programmes in Higher Education – International Perspectives* (27-44). GMV Fachverlage GmbH, Wiesbaden: Deutsche Nationalbibliothek (2008).

<sup>3</sup> The National Academies. *Beyond Bias and Barriers: Fulfilling the Potential of Women in Academic Science and Engineering*, The National Academies Press, Washington, D.C. (2007).

<sup>4</sup> D. Bilimoria, S. Joy and X. Liang, *Breaking Barriers and Creating Inclusiveness: Lessons of Organizational Transformation to Advance Women Faculty in Academic Science and Engineering*, Human Resource Management 47(3), 423-441 (Fall 2008).

<sup>5</sup> <http://sitemaker.umich.edu/advance/STRIDE> (accessed January 19, 2009).

<sup>6</sup> [http://wiseli.engr.wisc.edu/initiatives/climate/workshops\\_deptchairs.html](http://wiseli.engr.wisc.edu/initiatives/climate/workshops_deptchairs.html) (accessed January 19, 2009).

<sup>7</sup> A.J. Stewart, J.E. Malley, and D. LaVaque-Manty, Eds. 2007. *Transforming Science and Engineering: Advancing Academic Women*. University of Michigan Press, Ann Arbor, MI.; S. Rosser, and J.-L. Chameau, *Institutionalization, Sustainability, and Repeatability of ADVANCE for Institutional Transformation*. Journal of Technology Transfer, 31, 335-344 (2006).