

Women in Engineering Leadership Institute (WELI)

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Abstract

This paper presents an overview of the current activities of the Women in Engineering Leadership Institute (WELI) which are being funded through a National Science Foundation ADVANCE Grant. Details on these activities are given, along with an overview of conference assessment to date. In addition, future plans for the organization are discussed.

Introduction

The percent of women engineering and science faculty in mid-career and senior-level faculty positions remains very low: only 2.8% of all full professors in engineering and only 9.4% of all associate professors are women (Kang 2003). It is not atypical to find that many engineering and science departments with only one or two female associate or full professors (Niemeier and Smith 2005). Recent data also indicates that the progress of women into academic leadership roles has been slow, particularly at the department level. In summer 2000, for example, there were eight women department chairs out of the 298 engineering departments at AAU institutions (Niemeier & Gonzalez 2003).

Partially in response to low representation and both the positive and exclusionary effects of networking, the National Science Foundation sponsored the First Women in Engineering Leadership Conference in the fall of 2000. The conference, designed to enable women engineers to consider academic leadership roles and to develop the types of network that can facilitate transition to leadership positions, brought together 32 women engineering associate and early career full professors, all considered highly influential in their fields or on their respective campuses, to discuss academic leadership. Conference organizers hoped the gathering would enable women to expand their views beyond the boundaries of their home institutions and might stimulate new ways of thinking about academic leadership.

Many of the women at the conference felt that it was critical to continue holding future conferences of a similar nature. The Women in Engineering Leadership Institute (WELI) was formed as the primary vehicle for continuing networking and leadership development activities with a mission to:

- provide training, mentoring, and networking opportunities for women engineering faculty in academic leadership

- provide programs to encourage women engineering PhD students to consider an academic career
- serve as a clearinghouse for information and data related to women in academic leadership

Current membership includes participants of WELI conferences and a large number of women engineering faculty representing academic institutions across the United States and Canada. In order to continue leadership conference activities, additional funding was also necessary. In 2003 a group of WELI's membership submitted a collaborative proposal, involving six institutions, to the NSF Institutional Transformation ADVANCE program and received a three year grant with additional funding provided directly from the NSF Engineering Directorate.

WELI ADVANCE Grant

The six participating institutions include: Iowa State University, University of Utah, University of Connecticut, Syracuse University, Louisiana State University, and the University of Central Florida. Faculty members at other institutions were included as collaborators. These institutions include: Kettering University, University of Texas, El Paso, University of California, Davis, University of Maryland, University of Guelph, Canada, Texas Christian University, University of Pennsylvania, and Northeastern University.

The major activities of the grant are to sponsor two Leadership Development Conferences, a Leadership Workshop, a Leadership Summit and to develop a electronic networking community. The format of the conferences included:

- Leadership Development Conferences: Introductory, small-group, regional leadership conferences that introduce transformative leadership skills to mid-career women engineering faculty;
- Advanced Leadership Workshop: Small-group leadership workshops that offer the opportunity to develop advanced management and leadership skills specific to women engineering faculty leaders in academia; and,
- Leadership Summit: A gathering of existing professional organizations that promote women in engineering to promote expanded efforts to establish broad national goals and effective strategies for advancement of women engineering professionals through collaborative leadership.

The Leadership Development Conferences were designed to provide a forum for professional development, including awareness and improvement of academic leadership skills, opportunities to establish mentoring relationships, and resources for developing networking opportunities for mid-career women engineering faculty. An important outcome of the effort is the development of a support network for women engineering faculty who are interested in obtaining senior-level academic positions. The events are structured as a 3-day, Gordon Style conference, with daily activities and discussion forums. While each of the Leadership Development Conferences may choose a slightly different theme, all of the conferences assist participants in examining various leadership models, roles and positions in academia, responsibilities of leadership positions, and skills needed for such positions. Common modules include:

- identifying various leadership roles, both positional and non-positional, and the individual career paths that can be taken to achieve them;
- group team-building to encourage and enhance relationships that will extend beyond the meeting; and,
- successful leadership skills development.

The first Leadership Development Conference was held in Utah in November of 2003 with 30 participants representing 19 states. It was sponsored by the University of Utah and NSF. Speakers included current women engineering deans and leadership experts. An additional conference is scheduled for April 2005 in Florida.

The Advanced Leadership Workshops provide greater technical training and discussion in specific leadership areas for women engineering faculty who are in academic leadership positions or seriously considering that career path. Emphasis at the workshops is on examining transformative leadership, which is presented in discussion groups and skills training sessions. Discussion topics will include developing departmental/ academic unit budgets, strategic planning, legal issues, managing personnel, media training, and development efforts with alumni and industry. Outstanding women engineering faculty in leadership positions were invited to attend and share their experiences. Professional consultants also participated in the conference. This conference was held October 2004 in Syracuse, NY and was co-sponsored by Syracuse University, Louisiana State University and NSF.

The purpose of the Leadership Summit was to promote a broad national strategy for advocacy for women engineers in the workplace, both academic and industry, and to develop plans that optimize both member and organizational resources. A number of institutions and organizations across science and engineering are linked by a common desire to promote, recruit, retain, and advance women engineers (i.e., SWE, WEPAN, ASME Committee on Women and Minorities, IEEE Committee on Women, ASEE Women in Academia, AIChE, NSF ADVANCE Institutional Transformation Awardees, etc.), however, no single organization has committed to addressing the needs of women academics in engineering. The Leadership Summit, held in May 2004 in Storrs, Connecticut, brought together over 70 leaders of professional organizations to discuss collaborations that could be formed to provide a unified approach to increasing the number of women engineers in the workforce. A set of blueprints representing action items were developed in the following areas: Culture Change, Incentives to Increase the Attractiveness of Leadership Positions, Family Leave Incentives, External Support, External Marketing, Recruiting Faculty to Leadership Positions, Mentoring for Academic Leaders, Networking, Rewards and Awards, and Leadership Training. The results of this conference will be published this spring.

The electronic networking has been accomplished through various conversations and posting on a listserve of conference participants. During the next year, these activities will be defined and better suited to the community at large, as well as the women participants.

Impact of WELI Activities

To assess conference outcomes, participants were asked in a variety of ways to evaluate conference goals and objectives (Niemeier 2004a). Observations listed in these reports are based

on pre- and post-conference surveys completed by the participants. The participants, who completed the post-conference surveys (24 out of a possible 30 attendees) from the Utah Leadership Conference, unanimously responded that they would encourage others to attend a similar conference. They were also in strong agreement that as a result of the conference they felt part of a stronger network of women engineering faculty and had a better understanding of academic leadership. They were neutral about being more interested in an administrative position but positive about their interest in pursuing a leadership position such as center director or program director. Only one person indicated that she was definitely less interested in a leadership position after the conference. Nearly every participant identified some aspect of networking and/or the experiential effect of seeing and talking with role models as the most personally important conference outcomes.

With respect to networking, participants expressed significant appreciation for the opportunity to “*Network with so many women faculty*” and the sense of belonging to a “*network of awesome women which will facilitate mentoring, support, leadership*” that the conference imparted to them. Attendees also noted the value of meeting women from other campuses, which gave them opportunity to hear about a range of experiences.

With respect to the importance of talking with role models and being able to hear from these individuals, participants spoke of how speakers gave them confidence that they also could be a leader and made them “*more determined [to] become chair or dean.*” Many expressed appreciation at being able to “[*Meet*] such impressive women” and hear their career and personal stories. Many participants noted they felt that the conference had helped them to develop a larger skill set and a better understanding of leadership roles in academia.

The Summit participants also felt part of a stronger network as a result of attending the conference (Niemeier 2004b). The participants also felt that collaborative leadership is important for increasing women leaders. Conference participants indicated that the development of an action plan (i.e., the blueprints) was one of the most helpful aspects of the summit.

Overall, conference participants have developed new networks of women engineering faculty and have explored issues related to academic leadership. The conferences and the Summit have involved faculty and administrators from 96 institutions representing 38 states, Puerto Rico and Canada. While it is still too early to fully know the impact of the most recently funded ADVANCE grant WELI conferences, in a follow-up survey to the 1st October 2000 conference, participants were asked to identify campus-level activities specifically aimed at improving the status (climate, representation, etc.) of women faculty and/or engineering students in which they participated in on their campus in the past year (Niemeier and Smith 2005). As Table 1 shows, the range of activities at the campus and college level was substantial. Long-term assessment is needed on the effects of the conference on the choices of women to obtain leadership experiences; however, due to the recent demand for the Florida conference (some ?? applications for 40 slots), many interested women were turned away. Deans from the nominating institutions have committed resources to sending these women to a conference such as those offered by WELI. The conferences serve an important niche in the development of women leaders; specifically, their focus on women in academics is important.

Future of WELI's Activities

Recently a group of WELI faculty met in Salt Lake City to discuss the future of WELI's activities and its mission. The group plans to meet again within the next four months to discuss options for the next conference, how WELI might structure a partnership with other organizations, and other funding opportunities. Our focus will continue to be women engineering faculty, a group which does not have an existing interdisciplinary network, with a mission of providing support, including training, mentoring, and networking opportunities in academic leadership, for women engineering faculty. The goal continues to be to increase the number of women in academic leadership positions and to accelerate and enhance the success of women in academic leadership positions.

Table 1. Campus Leadership Activities

	Type of Activity (No. Attendees Reporting Activity)
Campus Level Activities	President/Chancellor Advisory Committees on Women Faculty (5) Sponsored/Organized Campus Level Workshop (7)
College Level Activities	Dean's Advisory Committee on Women Faculty (4) Dean/Chair Search Committees (2) NSF ADVANCE Advisory Board/Project Team (8)
Individual Activities	Mentoring New Faculty (15) Mentoring Students (17) Organized Faculty Lunches (1) Started Student Chapter in Women in Science and Engineering (1)

Source: Niemeier and Smith, 2005

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