

**2005-274**

**WEPAN**

**The Women in Engineering Programs and Advocates Network**

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Abstract

**WEPAN**, Women in Engineering Programs & Advocates Network, is a non-profit organization focused on strengthening the engineering workforce by strengthening the diversity within it. WEPAN was established to effect a positive change in the engineering infrastructure conducive to the academic and professional development of women and men. WEPAN's mission is to be a catalyst for change that enhances the success of women in the engineering profession.

Since 1990, WEPAN has worked to ensure that a full range of talent – including women from all demographic groups – choose to enter the engineering profession and will have the support necessary to succeed. With new technologies, global competitive pressures, and shifting employment patterns, that work has become even more critical. WEPAN has members from over 200 engineering schools, corporations including Fortune 500 companies and non-profit organizations, all who share WEPAN's commitment to enhancing the diversity of the engineering workforce.

In 2002, WEPAN unveiled a new strategic plan centered on three keystone statements. (1) To increase the visibility and inclusiveness of Engineering to engage all talent; (2) to catalyze change to create a critical mass; and (3) to make strategic choices that impact systemic change. The purpose of this paper is to provide an overview of WEPAN and its operations. This is followed by a discussion of how WEPAN can affect women faculty in engineering and areas in which both WEPAN and women faculty could benefit from increased interactions.

Introduction

Engineering education has long recognized the lack of diversity in their students. The numbers of students of color and of women who sought degrees in engineering in the 1970s were appallingly low. The retention of those few who started engineering programs was also of major concern. The National Academy of Engineering responded to what was deemed to be a national crisis by creating the National Action Committee for Minorities in Engineering – which now exists as NACME, Inc. This was indeed a message to the engineering community at large that the lack of diversity in engineering would not change unless proactive measures were taken.

As their response to this issue many institutions implemented special programs devoted to the recruitment and retention of women and students of color. Primarily located in colleges of engineering, these offices were dedicated to increasing the diversity of those obtaining engineering degrees. These offices often implemented outreach efforts for women and/or students of color, introducing these pre-college students to engineering. They recruited these special populations to their institutions by developing and implementing successful retention initiatives. As word of the success of the initial programs spread, the number of programs themselves began to expand.

Over the next 20 years, numerous institutions created Women in Engineering Programs (WIE) and Minority Engineering Programs (MEP) offices<sup>1</sup>. The MEP directors were the first to see a real need for a national network of directors who could share information about successful programs. NAMEPA, the National Association of Minority Engineering Program Administrators was created in 1979. In 1990, Suzanne Brainard (UWash), Jane Daniels (Purdue<sup>2</sup>) and Susan Metz (Stevens Institute), each with successful WIE programs decided that much benefit would be gained if a national organization addressing the needs of WIE directors and advocates was established. As a result of their efforts, WEPAN was created.

#### WEPAN Organizational Structure

**WEPAN**, Women in Engineering Programs & Advocates Network, is a national non- profit 501(c)(3) educational organization. It was established to effect a positive change in the engineering infrastructure conducive to the academic and professional development of women and men. WEPAN is focused on strengthening the engineering workforce by strengthening the diversity within it. The organization is led by a board of directors composed of both elected and appointed positions. The elected positions are President Elect, Secretary, Treasurer, and the Directors of Professional Enhancement and Membership.

The appointed positions consist of three (3) Directors (Communications, Diversity Advancement and Strategic Partnerships) and three (3) Member-at-Large positions (Faculty, Industry and WIE Program). A general description of the responsibilities of each of these positions can be found at <http://www.wepan.org/restructure.html>.

In 2004, WEPAN hired its first full time Executive Director. The ED is responsible for (among other things) the administration of the organization, and for proper interpretation and fulfillment of function, responsibilities, and authority.

WEPAN currently has over 600 members. Beginning in 2004, with the implementation of a new strategic plan and structure, WEPAN established a set of standing committees, through which much of the work of the organization is performed. The following is a list of the standing committees and brief descriptions of their purpose.

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<sup>1</sup> These are generic names only – the actual name used varied from one institution to the next.

<sup>2</sup> Jane Daniels is now Program Director of the Clare Luce Booth Foundation.

**Annual Conference Committee:** Develops theme and determines conference objectives; arranges for speakers, workshops, paper presentations, networking events, registration, hospitality and entertainment

**Awards Committee (subcommittee of Conference Committee):** This committee is a subcommittee of the Annual Conference Committee that designs and develops the Awards, Honors and Recognition Program

**Communications Advisory Committee:** Develops and recommends an integrated multimedia plan to promote WEPAN and its objectives to target audiences

**Diversity Advancement Committee:** Develops a strategy and action plan to advance the diversity of WEPAN. This might include, but is not limited to the recruitment, retention and engagement of a diverse membership and the identification of event speakers who reflect the diversity of the membership

**Finance Committee:** Manages WEPAN's organizational assets

**Membership Committee:** Develops and drives an individually targeted membership recruitment strategy based on targeted audiences such as WIE directors, industry, faculty, etc.

**Nominating Committee:** Prepares nominating strategy and time line and submits for Board approval

**Professional Enhancement Committee:** Develops and Drives strategies to provide professional enhancement activities for members

**Research/New Opportunities Committee:** Looks at national reports and issues to determine what research or programs are needed; determines where WEPAN can focus research or programs to meet national needs

**Sponsorship Committee:** In partnership with the President, Executive Director, and the Treasurer, develops the organization's strategy for building a strong sponsorship program, developing and driving annual sponsorship goals

#### WEPAN Initiatives

In the 14 years since WEPAN's inception, a vast array of programs has been implemented. Each of these programs was subjected to extensive evaluation and analysis. A listing of this program with short descriptions is provided in this section. All of these projects are aligned with WEPAN's mission to be a catalyst for change to enhance the success of women in the engineering profession.

**Making the Connection:** Funded by the Lucent Technologies Foundation, this tested curriculum which supports university and industry outreach programs brings engineering into the classroom for boys and girls in grades 3-12.

Mentor and Mentee Training Curriculum: Funded by the National Science Foundation and the U.S. Department of Education, this text was developed to train professionals and students in engineering and science in how to be effective mentors and mentees.

Faculty for the Future.org: Funded by the GE Foundation, this website links a diverse pool of women and underrepresented minority candidates in the technical professions with academic positions at universities across the U.S ([www.facultyforthefuture.org](http://www.facultyforthefuture.org)).

WEPAN Training Seminars: Funded by AT&T Foundation, Sloan Foundation, and the U.S. Department of Education, these workshops trained representatives from over 175 universities to establish and expand programs to attract and retain women studying engineering and science at the undergraduate and graduate levels.

National Climate Survey of Engineering Students: Funded by the Engineering Information Foundation, a survey of over 8,000 male and female students at 29 universities was implemented to assess perceptions of the engineering educational climate and to help universities identify actions for improvement.

WEPAN has also served as both an incubator and a strategic partner in launching programs aimed at enhancing the success of women in engineering and technology. By providing the infrastructure and expertise, and by bringing together committed and influential partners, WEPAN has been instrumental in the success of these efforts. The two examples below have attained national and international prominence.

MentorNet is the award-winning nonprofit e-mentoring network that addresses the retention and success of women in engineering, science, and mathematics. MentorNet provides highly motivated protégés from many of the world's top colleges and universities with positive, one-on-one email-based mentoring relationships with mentors for industry and academia. MentorNet began as a WEPAN Program at Dartmouth College and was subsequently launched as a national and global mentoring program. (See [www.mentornet.net](http://www.mentornet.net) for more information).

The Global Alliance for Diversifying the Science and Engineering Workforce is a collaborative initiative of the American Association for the Advancement of Science (AAAS), the Association of Women in Science (AWIS), and WEPAN. The Global Alliance is committed to increasing the role and participation of women in the science, math, engineering and technology (SMET) workforce worldwide. See [www.globalalliancesmet.org](http://www.globalalliancesmet.org) for more information).

## WEPAN and Women Faculty

It is believed that WEPAN can be a valuable resource for women faculty and in turn benefit from increased participation of women faculty in WEPAN activities. The following are a few examples.

Broader Impact – it is well known that the National Science Foundation now requires that all proposals address the broader impact. Specifically, the broader impacts of the proposed activities refers to the project's ability to benefit society at large in any of a number of ways, encompassing enhancing scientific understanding through broad dissemination; promoting teaching, training and learning; broadening the participation of underrepresented groups; and enhancing the infrastructure for research and education, such as networks and partnerships [1]

WEPAN can provide access to a wide array of outreach efforts taking place at universities across the nation. The Annual Conference is an excellent forum to hear about ongoing and new initiatives. Furthermore, it provides a convenient forum to meet and discuss potential collaborations with those implementing outreach programs.

Annual Conference – as previously mentioned, the WEPAN Annual Conference is an excellent venue for networking and learning about efforts to increase the participation of women in engineering. However there are additional benefits from attending the conference, with programs that would benefit women faculty. For example, at the 2004 Annual Conference the following pre-conference workshops were offered.

Patricia Witherspoon (Chair, Department of Communications, UTEP) conducted “Here's My Idea”: Women as Successful Communicators in the Workplace – a workshop that looked at the effects of gender on interpersonal communication; addressed women's strengths as communicators; and provided suggestions on how women may gain acceptance of their ideas through verbal and nonverbal communication [2].

A second workshop provided by Ruta Sevo (program director of the NSF Division of Human Resource Development) presented a range of how-to topics: how to shop among NSF programs, reading a solicitation, articulating your project interests, consulting with program officers, building a proposal team, writing and preparing a proposal and the typical NSF cycle of review. It is an orientation to how NSF does business and how you can do business with NSF. This workshop is especially aimed at those who are unfamiliar with the process and who want starting points.

A third workshop, “Forward to Professorship” presented by Catherine Mavripilis (an associate professor) and Rachel Heller (a professor and associate dean) was aimed at women who are currently or intend to become tenure-track assistant professors in science, engineering or mathematics. Topics of discussion included how to apply and negotiate for a position, make effective use of time to tenure, navigate the tenure-track process, secure research funding, get the most out of teaching and achieve a career and home balance in life.

The proceedings of each annual conference provide a publication forum for papers. Many women faculty engage in gender related research and activities resulting in publications that may not be suitable for the journals where they commonly publish. WEPAN proceedings are twice reviewed (abstract and full paper) and the conference provides an excellent forum for disseminating these results.

Status of Women in Engineering - WEPAN proposes to develop and market a comparable publication that focuses on the status of women and minorities in engineering and computer science at accredited universities in the U.S. The goal of this publication is to generate the level of competition, energy and commitment to change engendered by the U.S. News and World Report edition to the issues of representation of women and minorities in engineering and computer science. Among those topics that could be included that are specifically relevant to women faculty are how many women faculty are there currently; how many at each professional level; how many tenured; what is the percentage of women graduate students in the various degree areas; what is the retention of women undergraduate students in engineering? Much of this information exists, but not in one place, while additional useful information does not exist. Data of this type could be extremely useful to women faculty at various institutions, and could have an impact similar to the MIT Women in Science Report published in 1999 [3].

### WEPAN Strategic Plan

WEPAN has a strategic planning document that describes WEPAN's vision for 2013. There are 3 cornerstones of this document;

- Towards increasing the visibility and inclusiveness of engineering to engage all talent
- Towards catalyzing change to create critical mass
- Towards making strategic choices to impact systemic change

In each of these areas there are goals that are of potential benefit to women faculty. Among the more than 30 goals, the following is a selection of those that would be relevant to women engineering faculty;

- Best practices in diversity institutionalized
- Creating an academic culture that promotes success for women in engineering
- Double the doctorates awarded to women in engineering
- Triple the number of women in the engineering workforce
- Increase the number of female engineering faculty to 30%
- WEPAN membership includes 50 engineering deans and 200 women engineering faculty

Each of these goals recognizes the importance of the participation of women faculty in WEPAN's overall vision. Women faculty are essential role models for women students, both at the graduate and undergraduate levels. Their participation and visibility in outreach efforts targeted at young women and girls is, again, essential to the success of these efforts. WEPAN supports its own causes by giving necessary support to women engineering faculty. The goal of increasing the participation of women faculty in WEPAN indicates that WEPAN intends to be responsive to the needs of this constituent group.

### Conclusion

WEPAN is an organization that has dedicated itself to increasing the numbers of women in engineering. Directors of women in engineering programs have long been the backbone of the membership. However as WEPAN refined its goals and strategic directions, it recognized that to achieve the goal of increased participation of women, a wider membership was essential. Industry, government, private foundations and engineering administrators have all been recruited to WEPAN, with varying degrees of success.

A large part of WEPAN's strategic plan relies on the increased participation of individuals from both the corporate world and from institutions of higher education. It is hoped that this paper, and subsequent presentation at the ASEE National Conference will both educate and inform women faculty about WEPAN, the end result being increased visibility of women engineering faculty in WEPAN activities.

### Acknowledgements

The author acknowledges the contributions of Susan Metz (Stevens Institute and WEPAN co-founder) for her ideas on the status of women in engineering. Finally, much of the information presented in this paper is derived from WEPAN formal documents, including the WEPAN website ([www.wepan.org](http://www.wepan.org)), strategic plan and restructuring documents.

### Bibliography

1. Grant Proposal Guide, The National Science Foundation, 2004 ([http://www.nsf.gov/sbe/ses/common/ses\\_propsub.htm](http://www.nsf.gov/sbe/ses/common/ses_propsub.htm))
2. WEPAN 2004 Annual Conference Pre-Conference Workshops (<http://www.engr.utexas.edu/wep/wepan2004/PreConferenceWorkshops.htm>)
3. A Study on the Status of Women Faculty in Science at MIT, (<http://web.mit.edu/fnl/women/women.pdf>)

### Biography

DR. BEVLEE A. WATFORD, P.E. is President of WEPAN and Associate Dean for Academic Affairs in the College of Engineering at Virginia Tech. She is also the founding Director of the Center for the Enhancement of Engineering Diversity, established in 1992. Watford was the recipient of the ASEE 2003 Minorities in Engineering award due to her efforts to increase the recruitment, retention and graduation rates of under-represented students in engineering.

LINDA M. SCHERR is President Elect of WEPAN and recently retired director of IBM Women in Technology. As the founder of IBM's focus on technical women, Ms. Scherr was instrumental in developing programs for IBM technical women including outreach to college and pre-college women. She is a recognized authority on the subject of corporate women in technology. She was the 2002 recipient of the WEPAN Founders Award and was named a Fellow of the Association of Women in Science in 2003.