

MATERIALS AT WORK:

An Analysis of *Increasing Access for Women in Engineering*

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Increasing Access for Women in Engineering was developed by Stevens Institute of Technology, under a grant from the Fund for the Improvement of Post Secondary Education, to help increase the number of programs for women in engineering in the United States and to improve the quality of existing programs. *Increasing Access* is comprised of two volumes: *Administrator's Guide* and *Supporting Documents*. Each of the eight chapters in the *Administrator's Guide* is designed to stand alone, as are the major activities within each chapter. Chapters and activities, with few exceptions, can also be read and used in any order. Each chapter is supplemented by sample documents such as evaluation questionnaires and release forms. Permission is granted to print any part of *Increasing Access* for individual use, including supporting documents.

To disseminate *Increasing Access*, colleges of engineering were sent a mailing and asked to return the enclosed post card if they wanted a free copy of the books. Books were sent to the 116 who returned the post card. Books were also sent to 45 people who were involved in the project in some way and for the basis of comparison, to 23 institutions that had not returned the post card. A brief questionnaire was mailed to everyone who received books. Eighty-two responses were received (45%). In addition, eight sites were each paid an honorarium to test out a chapter.

TESTING THE CHAPTERS¹

Liaisons at each institution were interviewed four times (Fall 1995, Winter 1995, Spring 1996, and Fall 1996) and asked to describe:

¹ Three of the eight institutions are located on the east coast, four in the midwest and one is in the west; two are private and six public. All were colleges of engineering, with seven located within liberal arts institutions. Institutional representatives from seven of the eight sites had attended WEPAN training in the past, while the eighth attended in 1995/96. Two of the eight had attended training related to women in engineering other than WEPAN.

- current programs they do to recruit and retain women in engineering and other math and science areas
- issues on their campus related to women in engineering
- goals for their women in engineering programs
- their involvement in women in engineering training programs.

Individuals were also asked about specific issues related to their ‘test’ chapter, such as current fund-raising strategies or ways they work with community colleges. Within six months, seven of the eight institutional liaisons implemented at least some of the components from their chapters. In addition, pilot sites also tended to use activities from other chapters as well, most often activities from Managing and Evaluating Programs (5), followed by Assessment (2) and Pre-College Programs (2).

The degree of implementation over the two year period ranged from trying out a single strategy, like targeting a fundraising letter to female alumnae, to piloting a new peer mentoring program or advisory board. Over the two years that the sites tested the chapters, the overall number of WIE activities increased from 60 to 104. The major increases were in the number of panel discussion, mentoring and pre college programs. In addition seven of the eight sites are planning to do a mean of 2.6 new *Increasing Access* activities in the future.

The following is a description of chapter-related activities by site.

Chapter 1: Managing and Evaluating Programs

Prior to receiving the chapter, the site already had several chapter activities in place or was planning to implement them. For example, the site had been planning to develop an advisory board, and already conducted surveys with females every 5 years, two activities covered by the chapter. After reading the chapter, the site liaison found new ideas and strategies to implement with these activities, as well as the motivation to carry them out. During the course of pilot testing, a formal board was selected and met on campus. According to the institutional liaison, the chapter “helped” by providing the impetus to get the board up and running and provided specific program ideas, such as having the board participate in a career roundtable with students on campus and forming a focus group on issues for women on campus. After reading the chapter, the site liaison also felt a need to rethink how and what evaluation information was collected. While previously a survey was periodically sent out to all students, now the site will aim for a smaller sample with a higher return rate. More formative evaluation data on programs is also being collected after pre-college activities, career round tables and speakers. The site liaison has also used parts of the evaluation sections when writing proposals.

Chapter 2: Obtaining Funding

Prior to receiving the chapter, the liaison had a general interest in learning how to write better proposals and learning about new funding sources, but did not have significant experience with fundraising. During the project period, the site liaison did not apply for any major new funding sources, and so primarily used the chapter to increase her own knowledge base. While there appears to be no major change in terms of adding new funding sources (the program at this site remains largely university-supported), following a chapter suggestion the site recently sent out an appeal letter to female alumnae. According to the site liaison:

It's still hard for me to imagine sitting down and writing a proposal. How to get started is a big issue for me. The proposal writing sections- I do look back at those a lot. I refer back to the chapter every few months. The bibliography alone makes it worthwhile. I plan to look at it when planning new proposals.

Chapter 3: Assessing Campus Climate and Student Needs

No chapter activities were implemented at this site. While lack of funding to carry out an assessment was a factor, after reading the chapter the liaison still did not feel she had the skills, knowledge and experience necessary to carry out an assessment. Prior to receiving the chapter, the site liaison had planned to carry out a climate assessment and to conduct a focus group with female engineering students. These activities have not yet been done, although the site liaison still has plans to do so:

I am still hoping and planning to do at least a small climate and retention study to get data, but have not gotten the details yet. The first step is a survey. Since assessment is not my area of expertise, I want to get the opinion and advice of others at the university. I don't want to make it unrealistically large- I want to be able to analyze it. I need to do more strategizing about it. I still need to develop skills in survey construction, evaluation and data analysis. The materials were helpful but I feel like I need more.

Chapter 4: Developing Pre-College Programs

Prior to testing the chapter, the site had worked with a variety of pre-college programs and materials, including producing a video and hosting an Expanding Your Horizons conference. The site liaison primarily used the chapter with a new one week summer residential program. Although the program was already planned previous to pilot-testing, the chapter provided additional ideas, such as training tips for facilitators. The site also used numerous supporting documents from the chapter, including sample letters, the advertising brochure, evaluation forms, application, and the resident advisors job description.

Chapter 5: Designing Labs and Presentations for Pre-College Students

Prior to pilot-testing the chapter, the site was doing one pre-college program that included labs and presentations. The site liaison focused on implementing sections of the chapter with students participating in the pre-college programs, primarily sections pertaining to learning styles, cooperative learning techniques, developmental issues and brainstorming. The site liaison also used the tips for finding undergraduates for speakers panels. Pre-college activities at this site expanded throughout the project period to four programs, including a six week residential program for high school girls and an elementary school outreach program focusing on female role models. Prior to receiving the chapter, speakers, both students and others, were not formally trained or given information other than a context for the presentation. Now all student speakers working with pre-college programs are trained, using the questions and techniques listed in the chapter. In the words of the site liaison:

I realized that we need to be intentional about what we are doing, especially when planning pre-college activities. The chapter informed me on how to inform the students [who give presentations to pre-college students] how to give them enough information so that they feel comfortable. The materials helped give the process a sense of clarity, and helped me acknowledge the value of preparation and training for a program. I learned how to do it better. The resources in the module were especially helpful, plus the training and prep information.

Chapter 6: Developing Retention Programs

The site came into the project with eight WIE retention programs, including dorm room clustering for entering female engineering students, a mentoring program, a WIE conference with female alumnae, and an elective course "History of Women in Science and Engineering." The site continued, and in some cases, expanded these existing activities as well as implementing new activities from the chapter including: conducting a climate assessment, implementing chapter "tips" to increase faculty and administrative support for women, and setting up a student brown bag lunch lecture and discussion series. In addition, retention data is now being broken down by gender.

Chapter 7: Developing Mentoring Programs

At the beginning of the project, this site had no specific retention activities, but prior to receiving the chapter the site liaison hired a coordinator to help set up a new mentoring program. After receiving the chapter they implemented a peer mentoring pilot program for 20 undergraduate mentees and three mentors. The site liaison reported: "I have seen materials on mentoring before, but there were subtleties here, a different focus. The fact that it focused on women was a small but important change." The site is currently in the process of putting together assessment tools for the mentoring project, and is collecting information on mentor/mentee grades and retention. They are also developing an instrument to look at overall program effectiveness. Due in part to their evaluation data, the mentoring program is becoming a permanent budget line item.

Chapter 8: Facilitating Community College Transfers

There were no major program changes at this site. The pilot felt they were already implementing most of the chapter's suggestions, including holding a luncheon meeting for potential transfer students, joint SWE/community college meetings, on campus recruitment, university/community college faculty breakfast and yearly statewide articulation agreement meetings. The site liaison did add a focus group to look at the issues and needs of community college students. The site liaison felt:

The WEPAN chapter continues to be useful. We used it when we added the focus group. Truthfully we had been doing a lot of it [activities and suggestions mentioned in the chapter] already but it confirmed what we were doing. Through the module I also became more familiar with the articulation agreement, and got a lot of specific program ideas. Things we got from the module were the documentation and resources-- these were very helpful and provided justification of our efforts.

ANALYSIS OF QUESTIONNAIRES

Perhaps the most important result is that most (67%) of the questionnaire respondents read most (67%) of *Increasing Access*. They were most apt to read the chapters "Managing and Evaluating Programs" (51%) and "Developing Pre-College Programs" (50%) and were least apt to read *Facilitating Community College Transfers* (37%).

Within a semester 24% were using some aspects of *Increasing Access* including setting up a mentoring program (8), using evaluation and assessment information (8) and setting up a pre-college program (4).

Using the books, we have started a mentoring program. In the future, I would also like to work on retention and pre-college programs.

I found the book to be an invaluable resource as I take my relatively new WIE program to the next step in development. It has also provided me with personal strength, support and resolve to move forward with the WIE initiative here, and to bring together a formal committee of faculty, staff and students who are committed to their success of women in engineering.

In addition, over 70% of the respondents are planning to use *Increasing Access* in some way, including modifying existing programs (19), improving mentoring programs (17), starting new programs (14), assessing school/classroom climate (11) and copying and using supporting documents (10).

In the words of questionnaire respondents:

We will be using several of the materials, especially as we are preparing funding proposals for several of these projects. I wish to use this resource to stimulate ideas to gain support and justification for our programs, to serve as a format which we can adapt to our uses, to save time rather than re-invent from scratch, and to serve as motivation to keep going with our ideas.

I found the materials to be a combination of things already known and new information, but it was all really useful. There is nothing that can't be used- the only limitations are time and money.

This is an excellent resource for start-up programs. It has everything you could dream of.