EXPERIENCES OF NEW WOMEN IN ENGINEERING PROGRAM DIRECTOR

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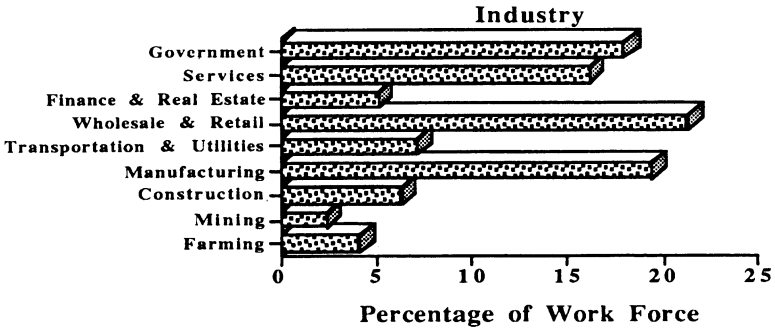
Introduction

As members of WEPAN, we are all well aware of the projected shift in demographics of the U.S. labor force in the next century predicting a decrease in the number of eligible males to pursue engineering. This fact has most college of engineering deans striving to increase the number of women and minorities enrolled in their perspective colleges. (Women comprise more than 50% of the college-age population and the most likely candidate to fill the gap.) The University of Kentucky's College of Engineering is no exception. With the help and encouragement of Women in Engineering Program Advocates Network (WEPAN), initial funding from the Chancellor of the University of Kentucky, and the dedication and determination of college staff, a "Women in Engineering Program" now exists to address this need. This paper describes the activities leading up to the creation of the program in 1991, a review of the first year of the program, and the problems or barriers encountered during that year.

Kentucky - What Are We All About?

Last Fall 1992, 82% of the undergraduate students in the College of Engineering indicated their home state was Kentucky. With such a large percentage of our students coming to us from within our own state, it is important for us to understand the demographics of our state[1]:

State Population ('90): 3,685,296 - 48.4% (M) 51.6% (F) - 51.8 % Urban 48.2% Rural



The work force of Kentucky is quite diversified. Farming and mining make up only a small percentage. The primary emphasis is presently on manufacturing, wholesale & retail.

Persons & Families Below the Poverty Level in KY (1989):

All Persons:	681,827	19%
All Families:	163,209	16%
Female Head-of-Household Families	60,887	39.6%

Educational Attainment:

High School Grad or Higher	64.6%
Bachelor's Degree or Higher	13.6%

History of Women in Engineering (WIE)

In addition to the projected shift in college-age populations, other motivating factors encouraged the College of Engineering to develop a "Women in Engineering" (WIE) Program:

- The 14% women students in the College was well below the National average of 16.5% women students (1990)[2]
- Kentucky ranks 46th out of the 50 states in the number of scientists and engineers employed in the work force[3]
- Kentucky's population grew by less than 1% during the 1980's while national population grew by 9.8% (11.9% *decline* in population under 18 years)[4]

At about the time staff members were seriously thinking about the reality of a WIE Program on the UK campus, a letter came from WEPAN announcing their first conference. This one meeting set off a series of events that was actually the turning point in the development of the program. One of Engineering's women faculty and a staff member from the College attended the conference, and returned having received much support and encouragement from everyone at WEPAN. They were excited and so eager to get the process moving. However, the biggest hurdle of all was before them - how to obtain monetary support from the University to fund the program.

In the Fall of 1990, the Chancellor of the Lexington campus developed an "Innovation & Excellence" plan to help assure the best programs were funded by the Colleges on campus. This was accomplished by taking 1% of the Lexington campus base budget and setting it aside for reallocation. Each college was invited to submit proposals for the usage of these funds. The funds were given to the units on a recurring basis for 1991-92 school year. The WIE Program (director's salary and expenses) was a perfect use of these funds. In the Summer of 1991, the proposal was submitted and funded finishing with high marks.

An additional factor benefiting the funding of this proposal was the presence of a new, supportive and energetic dean who joined the College of Engineering in August 1990. Dean Thomas Lester brought with him a new vision for the College of Engineering - one of growth and change. His commitment to increase the number of women and minorities in the College was and still is a vital part of the success of the program. He felt full-time support and direction for the Society of Women Engineers (SWE) and the women

undergraduates was essential. Meanwhile, SWE was hard at work developing a presence in the College. Their goal was to improve their image and reputation at all levels. There was an air of excitement in the College generated by the newly-elected SWE officers as they anticipated the new year and the new WIE Program.

My First Year

The early developments of the Women in Engineering Program were closely tied to the activities of the Society of Women Engineers Student Chapter. SWE had a set back the previous year (June 1990). They had lost their charter. With determined, new leadership taking office in the summer of 1991, they were quickly reinstated. As their new advisor, I felt it was important to develop a close relationship with SWE. Much of my first year was spent getting to know the officers, attending meetings/events and being supportive whenever possible. In addition I set the following immediate goals:

- familiarize myself with the College of Engineering (i.e. faculty and staff)
- meet with as many women students in the College to determine needs
- network throughout the university
- learn college curriculum

The following recruitment activities took place during the past year:

"Women in Engineering" brochure was developed for mailings to high school students in the state.

"High School Phonathon" - With the help of SWE approximately 75 students were contacted and encouraged to attend UK in the Fall.

Admission's Recruitment - Maintained a high profile at major recruiting events on campus, i.e. Minority Affairs events and Admission's Preview Nights for prospective freshman and their families.

Community College Liaison - Mailing to all community college counselors. In conjunction with Lexington Community College attended the "Women in Science" Conference in Knoxville, TN. Faculty and students from Lexington Community College attended.

The following retention activities were developed over the past year:

New Student Reception: Research shows that women leave engineering for reasons other than their male counterparts. Women rated problems with friendship networks "higher than any other group of students" (3). With this in mind, much effort was made to reach the first year student to get them involved with the College as quickly as possible. WIE sponsored a New Student Welcome Reception in which faculty, women engineers from community and SWE members were invited. An effort was made to recruit as many new students into SWE to provide a social network.

Brown-Bag-It Lunches: Monthly lunches were held with women engineers to talk with students. These informal gatherings are held to encourage dialogue between engineers and students. Attendance is very low at these lunches - considering changing to afternoon seminars.

Mentoring Program: Sixty out of 275 women engineering students requested a mentor. From the Lexington community 27 women engineers were recruited to act as mentors. A strong effort was made to draw mentors from the surrounding area. A "Kick-off Reception" was held so mentors and protegees could meet. A panel discussion using three mentors to explain their work to the students held in late Spring was also well attended group.

Exit Interviews: All students changing their major out of engineering are interviewed to determine their reason for leaving. This is helpful to determine the needs of the students. In most cases women student indicated their reason for leaving the College was due to 1) "engineering wasn't what they thought it was going to be". 2) "didn't enjoy the course work, i.e. chemistry and calculus". 3) "disappointed with progress".

Student Rapport: Lots of personal contact - Being available without an appointment. An open-door policy exists to all students. Special emphasis this year has been placed on improved advising in the College.

Problems/Barriers to Address in the New Position

Internal:

-Funding - Campus budget cuts have restricted activity.

-Relationship with SWE - How much or how little involvement with SWE functions?

-Lack of support networks in college and on campus
  -few female faculty in the College-four female out of 90
  -no women's center on campus for female students

-Low attendance at WIE sponsored functions?
  -communication?
  -timing?
  -subject matter?

-Lack of faculty awareness or understanding of gender issues. Little interest shown to learn.

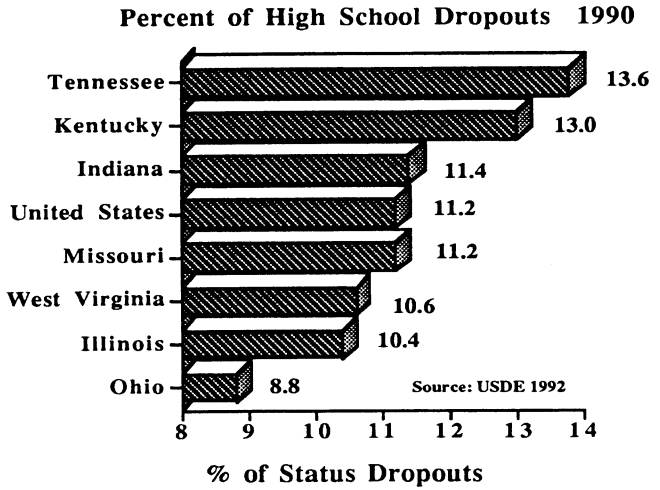
External: Recruitment:

Lack of role models and exposure to engineering. With my primary goal of increasing the number of women in engineering, we here in Kentucky are faced with additional barriers in reaching these young women. As mentioned earlier, a large percentage of our students come from within our own state, which is primarily a "rural state" (48.2% of population rural). Simply because of the lack of role models and exposure, parents and counselors in Kentucky do not understand what engineers do, and therefore do not encourage their young women to enter the field.

High Rate of Poverty. Also, due to limited family income, many qualified high school women in Kentucky cannot afford the privilege of a college education without some form of aid. (55% of UK's students receive financial aid which amounts to $46 million annually.) Also, according to a study sponsored by the

Kentucky Commission on Women, "one in five Kentucky women lives in poverty". This problem is being exacerbated by the increasing number of female-headed households with children. (39.6%)[4].

Inadequate high school preparation - There is a wide variance in the quality of high school education in Kentucky. In addition, Kentucky has a relatively large high school drop out rate relative to neighboring states (see below). (The Kentucky Education Reform Act is presently addressing these problems throughout the state, but it is too early to determine effect it will have.)



Strategies for the Future

In looking over the past year, much has been accomplished in getting the WIE program off the ground, but there is still a long way to go. The following is a list of activities/programs that I hope to implement in the near future. Some of these ideas will address the problems encountered over the past year:

- Survey the student body to determine student interest and needs
- Develop a weekly freshman seminar to assist in social and academic networks
- Further outreach activities with women engineers in immediate community
- Continue campus networking and develop advisory board of faculty and staff.
- Concentrate on freshmen retention - involve students in College of Engineering.
- Begin tracking women graduates of the College.
- Develop programs addressing career preparation/job search process for women
- Plan Career Day for high school sophomores/juniors and their parents.

In conclusion, I want to thank the Women in Engineering Program Advocates Network for their support over the past year. My two visits to the Purdue campus, first to meet with Dr. Jane Z. Daniels, Director of Women in Engineering Programs, in early 1992, and again for the Midwest Regional Training Seminar in October 1992, were most worthwhile and helped tremendously in my training process. We are pleased to note that the enrollment of women in the College of Engineering has increased to 15.9% for Fall 1992, and a third of the students receiving engineering scholarships for Fall 1993 are women. To date, the University of Kentucky (campus wide) has received commitments from sixty-one National Merit Scholars for Fall 1993. While it is too early to accurately determine what impact the WIE Program has had on the College of Engineering enrollment or retention, I am extremely optimistic and look forward to the years ahead.

References

1. U.S. Department of Commence, Bureau of the Census 1990, Census of Population & History

2. "Engineering Manpower Bulletin", No. 118, May 1992, American Association of Engineering Societies, Inc.

3. "Trends Affecting the Commonwealth", August 1989-July 1990, Kentucky Legislative Research Commission

4. "Industrialization of Kentucky: Resources & Constraints", March 1993, University of Kentucky