

**LACK OF GENDER DIVERSITY?
– CHANGE YOUR RECRUITING TACTICS.**

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Abstract

Gender diversity typically is considered when institutions of higher learning are faced with declining enrollments. It is well known that the percentage of women in engineering technology is quite low. Some of the recruiting techniques used to attract women to engineering technology can be modified to be more effective in achieving their purpose.

Women make up 54% of the present day college/university population on campuses where engineering technology is offered. [1] The recruiting techniques being used are not effective in producing an increase in the percentage of the women students in engineering and engineering technology. To paraphrase an old quote – “one size does not fit all.”

This paper is a follow-up to the paper that was presented at the Illinois/Indiana sectional conference in April, 2002. [2] That paper was based on a survey designed to identify the primary motivators leading women to choose engineering/engineering technology. The survey identified several salient points in the decision making process for women students. The foremost was the attitude of the home environment toward education. Another significant factor was the effect of role models and the encouragement towards a technology degree. The student’s success in math and science in high school was another significant factor. A more in-depth and thorough review of the data collected is offered here.

The need to address the perceptions of engineering technology held by the women candidates, their peers, and others that have great influence on their lives is visited. Factors that deserve consideration are the what, when and how to recruit women for engineering technology. Examples of programs and procedures that are in place at various schools are cited along with some creative ideas for consideration. The need for establishing an early awareness of the field and the stereotyping that must be overcome is addressed.

Introduction

Some schools of technology are experiencing as much as a 38% decline in enrollment in their engineering technology program. Many programs are being developed to increase awareness of engineering technology. Prominent examples of such include Project Lead The Way (PLTW), Expand Your Horizons (EYH), Purdue's Women in Technology and a similar program by IBM. These programs, along with others, are aimed at the overall problem of the lack of awareness of engineering technology. They are aimed at the general population and not at any specific segment of the population.

This paper examines the effectiveness of the approach and some possible shortcomings in the recruiting process for engineering technology (ET). It examines the number of female students in engineering technology, as well as those in the profession. It will provide some understanding of the motivators of young women and some of the problems that add to the lack of interest in ET.

Finally, some corrective actions are suggested to increase the participation of women in the profession. The corrective action will address the needs for short term and long term action on the part of educational institutions.

Understanding

Although 54% of the college population in the U.S. are women, only 15% [3] of the students in engineering, engineering technology and science are women. The average female enrollment in many engineering technology programs is less than 6%. The population of women in technology is not uniform with some areas having a higher enrollment than others. The following table illustrates the distribution at Oregon Institute of Technology (OIT) [4] and similar numbers are found at other schools.

Discipline	Total number of students	Percentage that are women
Civil Engr Tech	18	5
Mech Engr Tech	101	2
Mfg Engr Tech	80	12.5
Computer Engr Tech	210	7
Software Engr Tech	203	7
Electrical Engr Tech	74	4

Table 1: Women in Technology at Oregon Institute of Technology

- Women in the industrial workplace with an EE or EET degree make up about 6% of the total workforce. One third of that percentage are in positions overseas, leaving the US with only 4% of the workforce as women. Women on the college/university engineering

technology faculties have been slowly increasing or has remained the same over the last few years. [2] Women in the overall workforce is increasing at a miserable rate of 0.5% [5]

What, then, are the motivators that could possibly make ET more attractive to women? Before addressing this question, it is well to be aware of some of the governing forces in young women's lives.

- Women rate themselves higher than men in organizational skills and risk taking but consider themselves lower in math and science. Women's GPAs, however, are, for the most part, higher than men's. [6]
- In general, as young girls, they are encouraged into nurturing roles and away from the building and creative endeavors.
- Girls are not discouraged from pursuing engineering and technology, but they are not encouraged to select the engineering fields either.
- The computer culture that attracts young men does not attract young females because of the violence, redundancy and tedium associated with video games. They dislike the narrowly and technically focused programming classes.
- They have a perceived lack of technological skills and avoid them to save face.

A survey by Professors Holcombe and Hoffman [2] (Purdue University), asked women in the ET field, what were the top 5 motivators in choosing their career. Of the 65 respondents the most common answers were:

- Eighty percent responded that their family placed a high priority on education.
- Seventy-five percent indicated that someone encouraged them in math, science and to develop analytical thinking.
- Fifty percent indicated that there was a significant role model that encouraged them to pursue a technical field.

The prospect of high salaries and/or the potential of power were of lesser importance.

Problems that discourage women from entering the field are generated from several sources.

- Lack of awareness by their mentors. Young people look to several sources for direction in their future. Parents, counselors and teachers have a tremendous influence on them. Too many of these important people are unaware of what engineers and engineering technologists do and, in some cases, that the field even exists.
- Current recruiting practices are modeled to attract the male student [2] and do not take into consideration the differences in the mental attitude of the female gender. By mental attitude we are referring to ideas, such as, self image, self worth and the dislike for macho displays.
- There is a perception of the loss of femininity by entering the ET field. Outreach programs often present the field as being gender neutral, which is perceived as a loss of gender identity, not as equal opportunity.
- Women are often faced with the concept of "wife or life". [7] In today's society, the

husband can have a career, but the wife must balance a job, children and a home.

- Women do not like to compete with men in math and science course work required in engineering and engineering technology. They also do not wish to be considered a nerd by their peers.

Corrective Actions

To increase the number of women students in engineering technologies, a number of corrective actions should be considered. Not all of the suggestions will yield results for your region and not all will yield immediate increase in enrollment.

- When and where in the K-12 system to start is one of the big questions. When is ‘now’ and where is ‘it is never too soon’ but not later than the 6th grade to be most effective. Young women start losing interest in math and science about that time. [5] “Project Lead The Way” (PLTW) is a program that starts in middle school and exposes students and teachers to the field of engineering and engineering technology. Counselors are also involved. (For more information go to www.pltw.org) “Expanding Your Horizons” (EYH) is a program targeting all 8th grade girls. [4] “Teen-age Women in Science and Technology” is another program used by OIT. Each of these programs is aimed at familiarizing young girls with engineering technology at an early age.
- Institutions of higher learning can support the movement by providing role models and seeing to it that potential student teachers and counselors are exposed to programs such as these. Role models can come from academia or industry. Industry role models are by far the better choice, for they bring the work place to the students and have real world insight and answers for the questions students and counselors ask. Role models from academia can be effective also, but they generally carry an aura of not being from the real world. If you have a choice, select a female person to present to the school children. The loss of femininity concept is enhanced if you take a person into the high school classroom that looks more masculine than feminine. A woman with a family will help illustrate that having a career in engineering or engineering technology and having a family are not mutually exclusive.
- Whoever represents your institution must be ready with facts and figures regarding the work, the employment market and the working conditions. How they will be received by the male employees and how they will be perceived by the other non-technical employees will be upper most in the minds of the young women. An individual who can speak from first hand experience is the best.
- Avoid certain items that are of interest to the male but of lesser interest to the female. Presenting to the 11th and 12th grades or getting them involved in programs, such as those mentioned earlier, will probably not be productive since their minds are likely made up. You need to start well before the 10th grade so that the students receive the information and are equipped to use it in their decision-making process. Reliance on school counselors to champion your program will result in only marginal results. Go the students.
- Set up programs to educate counselors and teachers. As was mentioned earlier, most have little idea of what we do and where in the scheme of things we fit. Do not concentrate on the high school but involve the middle school also. Make sure the programs have substantial content and are not just time filler with a certificate of no value. They can be great allies or

your worst enemy.

- In targeting the female student, avoid sessions with mixed genders. Female students may be intimidated by the thought that their male counterparts will think their questions are dumb.
- Push for legislative actions, such as those in Massachusetts and Colorado. [8] Massachusetts requires engineering/engineering technology instruction in every grade, and Colorado requires that engineering be experienced every year from the 3rd grade up.
- Offer summer camps for women such as Purdue's Women in Technology summer camp and a similar program provided by IBM.

Conclusions

Do not ignore the largest potential student population that is under represented in your program. Bolster your enrollment by adjusting your attitude to attract more women to the program, but do it in ways that can be expected to produce the desired results. Women are not motivated by the same stimuli as male students. You must also start early and work with programs such as Project Lead The Way, or develop similar programs to raise the awareness of ET in the minds of young women. To attract more women to engineering technology, we need to educate counselors and teachers, as well as, students. The recruiting model used to recruit women needs to be significantly different from that used to recruit male students.

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