

AN ALUMNAE'S PERSPECTIVE ON ENGINEERING AND INVOLVEMENT IN A WOMEN IN ENGINEERING INITIATIVE

Suzanne E. Laurich-McIntyre, Ph.D.

Women in Engineering Initiative
University of Washington, Seattle, Washington

Engineering both as a profession and an opportunity to be involved in an industrial environment was a career option I took for granted while growing up. My father was an engineer and I was raised in an environment where I had contact with a variety of engineers. Although I never really knew quite what they did on a day to day basis, they always appeared to be very involved in their work and excited about it.

I don't recall any portion of my elementary education being gender selective in class assignments or achievement expectations. It wasn't until the latter years of high school that I began to realize that discrimination existed, especially from counselors. As a student I had always enjoyed both math and chemistry and done well in these subjects. Also, having grown up in Chile, I was bilingual from an early age and seemed to have a natural aptitude for foreign languages. This prompted many to suggest that I enter the foreign service or utilize my language skills rather than technical skills perhaps following a more traditionally female route.

By my sophomore year in high school I had completed all of the math classes offered at that time in the curriculum. The first noticeable struggle as a result of a lack of academic preparation for engineering was Freshman Calculus. I now realize that I had been actively discouraged from taking the newly offered calculus class by my counselor and therefore was less prepared for that freshman year than my male contemporaries. I no longer excelled, some classes were really a struggle, but I continued to plug along and get help from willing classmates.

In the mid-seventies, I attended the University of Washington where a student interested in engineering matriculated through the College of Engineering from the beginning of their freshman year and then applied to a department at the end of their sophomore year. Due to my interest in chemistry I thought of Chemical Engineering. During Chem labs in my second year, I discovered that I was extremely sensitive to organic-based chemicals and decided to choose another field of study. The engineering academic counselor suggested Ceramic Engineering which is based on inorganic chemistry. It was an up and coming field with many potential opportunities and also was one of the smaller departments.

I soon found out that this department had the highest percentage of women, 25%, and were actively recruiting from the community colleges. I'm pleased to say that this activity is still

very strong today. Isolation in my department was not a concern, but it was often difficult being in the extreme minority in many other classes. Some overt prejudice and discrimination from male faculty created challenges I had not expected in an academic environment. However, peer students were rarely a problem in this respect.

My living situations were not always supportive of my choices either. I was in a sorority during my first two years as an undergraduate. In my freshman class five out of thirty women were interested in engineering. By the end of that year, I stood alone, the others dropped for various reasons, perhaps the most popular being the degree of difficulty due to a lack of preparedness in high school and the lack of support and role models.

Following my junior year, during a summer internship at Ford Motor Company, I gained an insight of the industrial and research atmosphere where I thrived. My co-workers and bosses were very supportive and encouraging. I still maintain connections there and appreciate their concern in my professional development.

Following graduation in Ceramic Engineering, I joined an engineering company where I was the only female professional staff. Somehow school had not prepared me for the attitudes I encountered in that work environment. While I know that much of it was role model conditioning, it was sometimes difficult to be taken seriously and to receive the credit for the work I did. From time to time I encountered discrimination which reduced my opportunities to participate in certain work related activities. This did not change until I was able to prove that not only was I willing and physically able, but that I could also approach those situations in a gracious manner.

During this time, I found that the care that must be taken to preserve the male ego often requires so much special effort, and yet, I rarely find that the same concern and energy is equally applied to preserving my rights and respect as an individual. Perhaps, my naivete about the "business environment" resulted in some of the conflict I encountered. My naivete has since been resolved, but I am still not certain if the struggle is worth it.

During my four years of working I was very involved in the local American Ceramic Society. I think that being involved in a professional society gives one the opportunity to develop a support system as well as stimulating professional development. This is an opportunity I strongly encourage students to participate in while they in school as well as when working. I have continued being involved in the local section of the American Ceramic Society and find it very rewarding.

I entered Graduate School four years after receiving my BS. A professor of mine during undergraduate days had always encouraged me to continue my education and pursue a career in teaching. This professor's strongest words of encouragement were written on my recommendation letter "She has the will and knowledge to succeed, if only she can overcome her lack of self confidence." This statement hit the nail on the head; it prompted me to search inside for the confidence which had been developing but not always evident. I returned to the University of Washington to work under the tutelage

of a new professor in the department, and was sponsored for three years by an ALCOA Fellowship. As I reflect back on the past six years in Graduate school there have been trying times where I occasionally encountered a "locker room" mentality which was difficult to overcome.

Due to the camaraderie of students working for my advisor I never really felt isolated. While there were differences in expectations, once I was known, as for any newcomer, most of the barriers seemed to be shed. I still encountered faculty who were not comfortable with women in engineering and intimidated it regularly, however through peer support and work experience it was easier to ignore than in my undergraduate days.

The Women in Engineering Initiative (WIE) at the University of Washington was initiated during my fourth year of Graduate School. My first exposure to it was a questionnaire, which all female graduate students received, followed by an announcement of a discussion meeting. During my graduate career, I had been involved in the Graduate Student Senate, as a representative on several Faculty Committees and also served as an advocate of the students in my department. I had always been active in some arena. The philosophy of the WIE group evolving in the summer of '88 was very inviting. I had seen a number of female students go through engineering with a great deal of difficulty. Many were ill prepared to deal with technical courses due to lack of experience but were no less bright than their male counterparts. The most distressing thing was to watch them being overcome with frustration because either they were not given the training to utilize the equipment, or because those who were more adept would take over and they would never have a chance to learn. Because females lacked the technical skills they were often relegated to being recorders in labs rather than active participants. Time and grades were of the essence so very little attention was paid to the development of the female students as individuals. Watching this occur and a remembrance of my own undergraduate and work experiences made me encourage the female students to get more involved in labs and develop an assertiveness required to overcome some of these situations. They were paying for their education and yet were being limited in experiences by those around them. It was difficult sometimes to assist them in making the transition because they did not want to stand out in the crowd or were willing to let others direct them, falling into a stereotypical role. The future was going to present them with similar challenges and yet many of the females did not have the skills to deal with them positively.

Participation in WIE has been a very rewarding experience for me. Having the opportunity to work with female students to develop a supportive environment and encourage them to pursue engineering has been extraordinary. As one of the original participants, it has been a challenge to be involved in the development of the programs which WIE offers and observe first hand what the student needs are. Invariably some aspects change with each group of students, however, the enthusiasm of those who are involved is phenomenal. New ideas and efforts to assist in increasing the

numbers of women who obtain an engineering degree are numerous and it is optimistic to see many of the students take this program on as a mission. One of the most encouraging aspects of my involvement in WIE is witnessing the camaraderie developed among the students to make this program work, not only for themselves, but also for the future. It is rewarding to participate in an activity where individuals are extending themselves and reaching out to assist one another in achieving their personal goals. Learning to develop self confidence and to take on tasks in an assertive, non-aggressive, manner has been a part of my education from being involved in WIE. Following graduation this past Spring, I have chosen to remain and work for WIE as Program Coordinator for the coming academic year. I see this as an opportunity for me to assist the next generation of female engineering students achieve their goals.

Perhaps a program such as WIE at other institutions could assist the female students in gaining the assertiveness to deal with the stereo-typical way they may have been treated, as well as become a forum for the women to assist one another. It is an ideal to strive for a more balanced educational atmosphere in which both women and men can succeed in the fields they have the skills and interest to pursue rather than being shackled by some of society's archaic role expectations.

The effectiveness of a WIE type program can be measured in the number of students who continue with their education despite overwhelming obstacles and little assistance or support. Another more subjective measure is the personal and professional development gained by an individual through such a group, such as developing necessary skills and then training others in the same areas. Some examples of how the UW WIE program helped individual students follows.

1) A student has average grades, Bs, or a little below, and does not get accepted in a department. The student includes no explanation in her application letter for the lower grades due to the desire not to be singled out. Yet the circumstances are more than adequate and should be considered. She is a single mother of young children who has to work almost full-time during the week for support funds and is also caring for ailing family members. She has distractions and responsibilities that most of her classmates do not face and she deserves recognition for handling them and maintaining a 3.00 GPA. WIE helped her in realizing that her responsibilities were worthy of recognition and encouraged her to appeal including an open statement of her situation to the department.

2) A Graduate student has been pursuing a Ph.D. with little or no direction from an advisor, constantly having to overcome discrimination from foreign students in the laboratories and a general lack of commitment by the department. Failing her General Exam, the recommendation is made seven years after she began her studies that she is perhaps not Ph.D. quality and ought to leave. Thru WIE, we were able to find her another advisor in the department who recognized her potential and was willing to support her endeavors. Within two years she had mastered a new area, completed a dissertation study and received her Ph.D.

3) A student who fails the Qualifying exam for the Ph.D. study on the first attempt and is told she must stop after the Master's thesis. She is discouraged enough that she considers not even completing her Master's degree. She had to be convinced that there are other alternatives and she would only be damaging herself by not completing her M.S. degree. Assistance came in the form of peer support and counseling to help her regain her self confidence and complete her thesis. This was followed with assisting her to deal with job interviews and accepting positions when she still harbored a feeling of failure.

4) The pre-engineering students who are isolated perhaps by shyness or uncertainty but do not know where to go for assistance or feel that they are receiving incorrect information. The Support group meetings can assist them in networking, to meet others in their classes, as well as upperclass students who are more familiar with their area of interest and can give them information about faculty and courses.

5) There are usually a number of transfer students who have different needs from the general population. They are rarely prepared for the size of the classes, the stringent rules or the intense competitiveness of their classmates. Orientation programs seem to cover less of the particulars so they find out most information by chance. The transfer student is also quite often an older, new or returning, student who is very directed and goal oriented as well as being more mature in their approach to education. Their expectations of interactions with professors and teaching assistants are often not met and difficult to overcome. There are also a number of students who are still raising children, in a couples situation or as a single parent who require additional assistance. Helping them in meeting the new challenges and assimilating is part of a WIE program.

6) A WIE program can also assist the women in establishing both academic, i.e study groups and tutoring services, and emotional and social support systems to assist them in completing their educational goals.

7) A mentoring program on two levels is also of great benefit. There is matching of upperclass students with underclass students to assist them in dealing with the University environment. Also mentoring of students by practicing engineers and faculty can assist the students in being better prepared for entering the work force as well as developing their talents.

These are but a few of the many services which a Women in Engineering Program can provide to the student population. Perhaps one of the most important is assisting the students to continue to believe in their interests, abilities and talents when faced with the odds of being but one of a few in their chosen career path. As the numbers of women in engineering increase perhaps the barriers will not seem as overwhelming and some of the issues faced by women, young and old alike, will be resolved. This achievement will result in a more homogeneous task force of engineering oriented individuals who can contribute to advancing technology based on their true capabilities and not a false stereotypical perception.

