

## Women in Engineering and Technology Program at Purdue University North Central

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**Abstract:** A mentorship program for Women in Engineering and Technology began in the 2002 Spring Semester at Purdue University North Central. The program empowers women in technical fields. Given the high potential for women in engineering and technology and the low enrollment that engineering and technology programs have averaged, it is imperative for educators to address this issue and help female students realize and explore their potential. This paper describes how to start a program like ours, at a small college with no budget, and explains the steps, vision, direction, boundaries, benefits and ways in which to get such program started. It also assesses the tangibles and intangibles from a mentorship program like ours.

### **Introduction:**

There are a small number of female high school students that are interested in engineering and technology and enrollment in this field at the college level. However, there is a high potential for women in engineering and technology. At the end of the nineties, the percentage of women enrolled nationally was close to 20% <sup>1</sup>, with a growing rate around 0.3% annually.

It is imperative for educators to address this issue and help female students realize and explore their potential. Purdue University North Central (PNC) is aware of this issue. Traditionally we have male dominate classes in Engineering and Technology programs, and we have a high necessity to help female students withstand negative peer pressure and show the students female role models to inspire them. At PNC, we have a small female enrollment in Technology as shown on the following Table 1.<sup>2</sup>

<b>Table No. 1. PNC Technology Enrollment</b>					
	<b>Women</b>	<b>Men</b>	<b>% Women</b>	<b>% Men</b>	<b>Total</b>
<b>Summer 2000</b>	52	131	28.42%	71.58%	183
<b>Fall 2000</b>	172	375	31.44%	68.56%	547
<b>Spring 2001</b>	154	367	29.56%	70.44%	521
<b>Summer 2001</b>	59	129	31.38%	68.62%	188
<b>Fall 2001</b>	158	369	29.98%	70.02%	527
<b>Spring 2002</b>	134	355	27.40%	72.60%	489
<b>Summer 2002</b>	48	117	29.09%	70.91%	165
<b>Fall 2002</b>	146	358	28.97%	71.03%	504
<b>Total</b>	923	2201			3124
<b>Mean</b>			29.53%	70.47%	
<b>Std Dv</b>			1.39%	1.39%	

However, the general enrollment at PNC experiences the opposite situation when looking at gender as shown on Table 2.<sup>3</sup>

<b>Table No. 2. PNC. ENROLLMENT BY GENDER BY LEVEL</b>					
	<b>Graduate</b>		<b>Undergraduate</b>		<b>Total</b>
		<b>%</b>		<b>%</b>	
<b>Men</b>	3	13.64%	1,486	40.88%	1,489
<b>Women</b>	19	86.36%	2,149	59.12%	2,168
<b>Total</b>	22		3,635		3,657

PNC has a general recruitment program but there is not a specific program for retention of students in Engineering & Technology. It is common to find only one or two women in each class for fields like engineering and construction. Isolation makes many women think twice about staying in a male dominated environment. Many female students end up switching to other areas where more women are enrolled. It is easier for female students to make friends and find support and help along their academic path in non-technical programs.

After the Construction Management program lost a female student a year and half ago because she was lonely, we decided to start a program called Women in Engineering and Technology (WIE&T) in an effort to retain female students. WIE&T is dedicated to recruiting and retaining female students to enrich the engineering and technology profession, making more equitable the gender participation.

For many colleges, like PNC, there is a great need for recruiting and retention programs aimed at female students. In our case, we got started by contacting the main Purdue campus to get their support, since they have a mentoring program for female engineering students. As a result, they shared materials and strategies with us and committed to assisting our efforts with occasional visits to our campus and continued support.<sup>4</sup> Their support gave us a starting point when

designing our program; and allowed us to quickly define our mission.

The main focus of our program is to encourage women to study Engineering and Technology through the creation of an environment that helps nourish them during the completion of their studies and helps to retain them in their chosen fields. The program encourages students to succeed not only academically, but personally and professionally through seminars, talks, and discussions with guest speakers from alumni, industry and academia. The goal is to provide our female students with valuable resources, including career opportunities, and help them strengthen their skills. A mentoring segment, where second year students advise and work with first year students, is an essential part of the program.

When looking at the program, we also focus on retention and ways in which to encourage women to study engineering. Because there is an active recruitment program already in effect at PNC, we concentrate on ways in which it could be enhanced to achieve our goal of reaching potential female students. As a result, Engineering and Technology faculty and advisors visit area high schools to encourage students to enter into engineering and technology fields. Female students are clearly shown the job market opportunities and the benefits of studying such fields. The academic requirements and admission process is clearly explained so they can get started on the admission process.

We also try to take advantage of career fairs held at many high schools in the area so that students can interact with faculty and advisors, allowing students to get a better idea of how WIE&T can help them with support from peers, mentors and faculty during their journey.

During the ‘Day on Campus’ sessions that are held for local high schools, students receive hands on experience with a CAD software. Students are shown how to create a drawing, and after some instructions, they are taught how to make their first drawing. We take advantage of this opportunity and try to encourage female students to consider a career in engineering & technology, and again, we explain to them about the admission process and requirements to be admitted at PNC.

Faculty and advisors are also present during registration to communicate with students and to help keep students informed about all programs. These people also participate in registration off campus, at companies where there are students already working in the field. We take advantage of this situation, encouraging female students not only to take classes, but to be part of the engineering and technology field. We explain the support they can gain through our WIE&T program.

Since the program’s main objective is the retention of female students in the Engineering and Technology programs, we offer different activities and vehicles to help our students feel supported and encouraged to continue in their fields. One of the activities that help our female students is bringing in female speakers, including alumnae, and junior and senior students to share their experiences, and in some cases, to talk about technical topics. These workshops help our students learn about career opportunities and different job profiles. There are discussions about balancing career and family, ways to improve resumes, interviewing, internships, participation in

technical clubs, i.e. PNC's Construction Club, and continuing on to graduate school among others.

There is always a question and answer session following each speaker which has shown us that topics covered are an important issue in the formation of our students. It is important for students to hear with their own ears how others have managed to succeed and grow professionally. Students are inspired when they find role models and witness how women manage to build successful careers and have accomplishments that make them proud to be women. Students feel connected to the speakers and the topics covered. They learn practical ideas from the meetings.

The mentoring program provides a 'one on one' contact that allows our mentees the opportunity to find support, and ask questions. Mentees are advised by other women that have already experienced what they are experiencing and relate to their concerns. Meetings are held two or three times each semester, so there is continuity, but not so our students feel burdened by it. There are also annual awards to highlight achievement and attendance at the meetings.

### **Making the program work:**

Although a program aimed at retaining and recruiting female students is needed at many colleges, a budget is usually a great concern. We would like to argue, however, that the most important aspect is to have a great deal of enthusiasm. There were no funds available when the Women in Engineering and Technology program was initiated at PNC.

The second semester of the program, a Recruitment/Retention Grant was written and a small amount was approved to defray the mailing cost of running the program at PNC. This money has been used for mass mailing notification and to announce the meetings and the speakers featured. It is important for the program to become publicized, so that all our women can benefit from it. For colleges that find the lack of funding an obstacle, we would like to suggest that a student volunteer club be formed to at least allow females the benefit of talking to more experienced people.

Feedback from students has been an important aspect of the program. It allows us to continuously improve. In every session, a survey is conducted to both analyze the success of the meeting and to determine the students concerns at the time so that speakers can be invited for follow-up meetings. Attendance is closely followed so that we can better understand and monitor its progress. We also keep track of attendance at our high school presentations so that we can correlate it with applications to PNC. We are currently using the surveys and attendance as an indicator of the program's effectiveness.

### **Conclusions**

It is important to know that high school visits allow us to encourage students and make them think about their futures regardless of whether they enroll at PNC or embark in technology or

engineering careers else where. We highlight the importance of a degree and how education really makes a difference in life. Education is the best legacy that parents can give to their children.

The WIE&T meetings have provided our female students with valuable information and have allowed them to interact with others and feel a part of a community that shares values and concerns. The mentorship program has allowed students to find guidance from more experienced students.

### **References:**

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<sup>1</sup> Science and Engineering Indicators 2000, Vol2; Appendix Table 4-33. National Science Board, National Science Foundation.

<sup>2</sup> PNC Technology Enrollment Summary, years 2000 – 2002. Admissions Office.

<sup>3</sup> PNC Enrollment Summary Fall Semester 2002. Admissions Office.

<sup>4</sup> Halloway, Beth M. & Rektaitis, Janine K., August 13, 2001 communication sent to PNC Chancellor Dr. James B. Dworkin.

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