

COLLEGE CARETAKERS: FEMALE ENGINEERING STUDENTS AS VOLUNTEER RECRUITERS¹

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If we didn't do it, who would? There is nobody challenging us for the jobs.

Female Engineering Student's Comment on *EEE* Activities

ABSTRACT

The research for this paper is part of a doctoral dissertation which examines aspects of engineering education, especially as it applies to female students, at the University of Saskatchewan. The paper analyses the role female students play in organizing the work of the College of Engineering's outreach/recruitment committees. In a survey of a first-year cohort more women than men indicated that they were interested in becoming involved with the *Engineering Students' Society (SESS)*. However, that group has been dominated by male students. In contrast, the various outreach initiatives are organized almost exclusively by female students. The data for the paper are based on a group discussion with six upper-year students who chaired the *Encouraging Enrollment in Engineering (EEE)*, *Discover Engineering* and *Sci-Fi* committees and the fund-raising *Student Activity Fund (SAF)* committee.

INTRODUCTION

Since the mid-1980s governments and industry have encouraged women to seek education and employment in non-traditional fields and professions. For example, the Federal government introduced the Canada Scholarships (now defunct) to promote science and technology education. One half of these scholarships were allocated to male students, the other half to female students. Because women's participation in science and technology had been considerably lower than men's, it appeared to many that a disproportionate number of the scholarships were awarded to women.

This pressure to include more women in science and technology education, combined with human rights legislation, gave rise to various recruitment strategies at the College of Engineering at the University of Saskatchewan. The *Encouraging Enrollment in Engineering (EEE)* recruitment committee was established in 1988 with a mandate to increase female enrollment. The program has affected the first-year female enrollment: From a low of 4.8% first-year female students in 1987, there was a high of 24.4% first-year women registered in 1995. Recent college statistics indicate that the proportion of first-year female enrollment has stabilized, or

¹ An earlier draft of this paper is being published as a monograph by the Women's Studies Research Unit at the University of Saskatchewan.

stagnated, at roughly 21%.

TABLE I: PER CENT OF WOMEN REGISTERED IN FIRST YEAR AND TOTAL FOUR YEARS, 1987-1997

Year	1987	1989	1991	1993	1995	1997*
Year 1	5	10	14	22	24	23*
CollegeTotal	6	9	12	16	21	22*

Sources: University Studies Group, 1993 and 1997. The * derives from College statistics.

However, there is a loss of female students throughout the four-year program. The greatest attrition, which at times has been close to 40%, has taken place between year one and year two. But women, as well as men, also leave the program in the following years. On the other hand, coinciding with the increased enrollment, the overall graduation rate for women has increased over the years, from 6% of total degrees awarded in 1989 to 20% in 1998.

TABLE II: PER CENT OF FEMALE STUDENTS IN EACH YEAR AND GRADUATION, 1994-1997

Year	1994/95	1995/96	1996/97	1997/98
First	23	24	21	23
Second	22	21	24	25
Third	14	19	20	21
Fourth	11	16	17	19
Graduates	11	19	18	20

Source: Office of the Dean, College of Engineering.

TABLE III: DEGREES AWARDED 1988 - 1998

Year	1988	1990	1992	1994	1996	1998*
Total	179	160	161	183	189	162*
Female	14	14	14	22	36	33*
Percent female	.8	9	9	12	19	20*

Source: University Studies Group: Statistics 1992, 1993, 1994, 1997. The * indicates College estimate.

In this paper I will address the work of the female students on the College of Engineering recruitment/outreach committees, which is an aspect of one of my research questions: *In light of the high attrition rate for women (close to 40%), what kind of cultural, educational, and social influences do women experience during their tenure as students?* These issues were discussed during a meeting I arranged with a group of six female students who were executive members on several of the college outreach committees: the *Encouraging Enrollment in Engineering (EEE)*, *Discover Engineering*, *Sci-Fi* and *Student Activity Fund (SAF)*. The women talked about their reasons for participation and they explained the benefits they derived from the activity. I will first give a brief overview of the purpose of the *SESS* and the outreach committees before turning to the narrative data from the group meeting.

THE OUTREACH INITIATIVE

The *Saskatoon Engineering Students' Society (SESS)* is part of a long standing masculine tradition within engineering education and the engineering profession. The executive is the liaison between the student body and the administration on academic issues. In addition, the purpose of the *SESS* is to arrange activities for the students while they are at the university. In the past, the *SESS* has published a very sexist, racist college paper, the *Red Eye*, which has offended many.² It arranges an annual *Pie Throw*³ and a street hockey tournament, both for charity, as well as collecting food for the local Food Bank. Since the early 1960s, the *SESS* has organized the triennial *Spectrum* public exhibition, an all-out college display of work produced in the college. A major activity in the early fall is *Hell Week*,⁴ featuring the *Red Eye Stomp* and the *E-Plant* event, pub crawls and other beer nights. The *Lady Godiva Ride*, where a woman rides naked on a horse and which was a part of the *Hell Week* activities, was ordered discontinued by the university administration in the early 1990s and the *Red Eye* was forced to tone down its sexism.

In contrast to the *SESS*, the recruitment initiatives are a relatively new venture and are administered by the student run *Encouraging Enrolment in Engineering (EEE)* Committee, which is funded by the Office of the Dean. The programs consist of (1) *High School Promotions* where students make presentations to Saskatchewan high schools and act as role models to demonstrate that the engineering profession is an option for women. (2) *On-Campus Tours* of the college are offered to interested high school students, and during (3) *On-Campus Days* students may attend first-year lectures and be exposed to lab demonstrations. (4) A sub-committee that the *EEE* started in 1993, organizes the *Discover Engineering* weekend conference for grade 8 girls. During this conference, the girls tour the college and attend seminars and workshops which expose them to various “hands-on” applications of science and technology in a non-competitive environment. (5) Another outreach program, inaugurated by the *EEE* in 1991, is the summer *Sci-Fi* camps for grades 5 to 8. These are week-long, co-educational day-camps where the participants learn how to make age-appropriate items that feature and apply scientific principles. Organization of the *EEE* and *Discover Engineering* committees are based on volunteer participation, while the *Sci-Fi* co-ordinator and instructor positions are paid summer employment for students. The *Student Activity Fund (SAF)* solicits industry funding for the *Discover Engineering*, *Sci-Fi* and *Spectrum* programs. The college itself also arranges *What is Engineering?* day where faculty, students and invited speakers present the many facets of engineering to invited high school students and teachers from across Saskatchewan.

TABLE IV GENDERED DISTRIBUTION ON SASKATOON ENGINEERING STUDENTS' SOCIETY

	1993-94		1994-95		1995-96		1996-97			
	1997-98									
	M	F	M	F	M	F	M	F		
President		0	1	1	0	1	0	1	0	
Executive	5	3	5	3	7	1	6	2	6	2
Total	5	4	6	3	8	1	7	2	7	2

Source: Joeline Mackay, 1997/98 coordinator of *EEE* Committee.

² In the 1980s, the *Red Eye* faced a Human Rights complaint that, in the end, was dismissed by the Supreme Court.

³ *Pie throw* (in algebra, $\pi = 3.14$, is a concept and a number necessary for calculating the circumference and the area of a circle) is a charitable fund-raiser in the college whereby a cream pie is planted in the face of unsuspecting “victims.” Pies can be bought, redirected for a fee or accepted “in the face.”

⁴ “*Hell Week*” is a week of concentrated fun, games and beer drinking that is supposed to create community spirit among the students in the College of Engineering. The *Red Eye Stomp* consists of large numbers of red-clad and red-painted engineering students running through the other buildings on Campus, making noise and attracting attention to their superiority as engineering students. The *E-plant* is an event where the engineering students “capture” an executive member of the agriculture students, strip him (girls are never stripped) down to his underwear and tape him with duct-tape to a large E. Other, blue-painted, agriculture students are then expected to “rescue” him, during which a “battle” takes place. The weapon is spray cans of shaving cream liberally aimed in all directions. During this “battle” there is an attempt to strip clothes off the male combatants in a process called “*pantsing*.” Again, girls are never “*pantsed*.” If the Agros manage to release their E-planted member, they have won; however, this does not happen very often! This *E-plant* battle is a general university “entertainment” event watched by large numbers of “neutral” students.

TABLE V PARTICIPATION IN *EEE* RECRUITMENT COMMITTEE

	<u>1996-97</u>		<u>1997-98</u>	
	Male	Female	Male	Female
Coordinator	0	1	0	1
Executive	0	8	1	7
Total	0	9	1	8

Source: Joelene Mackay, 1997/98 coordinator of *EEE* Committee.

TABLE VI PARTICIPATION IN ORGANIZING *Discover Engineering* CAMP FOR GRADE EIGHT GIRLS

	<u>1994/95</u>		<u>1995/96</u>		<u>1996/97</u>		<u>1997/98</u>	
	Male	Female	Male	Female	Male	Female	Male	Female
Coordinator	0	1	0	1	0	1	0	1
Executive	3	5	2	5	0	7	1	6
Total	3	6	2	6	0	8	1	7

(In 1994/95 there was one extra position on this executive)

Source: Joelene Mackay, 1997/98 coordinator of *EEE* Committee.

As the tables show, there was a gendered division of labour in the composition of the college committees. The women had concentrated their extra-curricular efforts on outreach committees and carried a disproportionate load there while they were under-represented as executive members of the *SESS*. *Spectrum* requires an all-out effort on the part of both faculty and students, and it, too, relies heavily on the work of the female students. During the last production in 1998, a male co-ordinator assisted by 18 female and 24 male students worked to prepare for the exhibition, with additional student help during the show itself.

Women appeared to be excluded from positions of power within the *SESS* with the exception of the 1993/94 executive which had a female president.⁵ While the *SESS* has traditionally been a male enclave, the opposite is true of the *EEE* which has become a niche for women. Have these committees been designated “women’s work” and therefore accorded lower prestige and priority than the *SESS*? Although one female informant did not hesitate to place the *SESS* in a more prestigious position than the outreach committees, another believed that the two were equal, saying that “if you’re involved, it doesn’t matter how.” The latter thought that because women are considered better communicators than men, the outreach focus was ideally suited to women. She also suggested that “a female voice is more nurturing.”

THE GROUP MEETING

During the meeting with the six women organizers of the *EEE* committee they expressed their loyalty and dedication to their college and to their work. They believed that their volunteer work made a difference to the college by bringing in new students, and that the recruitment programs were needed. They also agreed with the almost 50 students I interviewed during my research that women had a place in engineering. However, most of those students, both female and male, expressed the view that gender did not matter. They were all *engineers* because they had received the same education, had attended the same classes, had read the same texts, and had done the same lab exercises. They were thus qualified to be *un-gendered* engineers. In other words, the women had denied their gender in order to be accepted and to succeed in a masculinized college.

On the other hand, the organizers felt that they personally benefited from their work, although not monetarily. Rather, their benefits would be much longer lasting, lasting them through their life time. These women had learned to cooperate to achieve their goals. They also realized that they needed the support of their male classmates for the school visits and in order to establish any new outreach programs. They insisted that they were not excluding male students, but they could not force them to work on the committees⁶ and indicated that they expected four male members the following year. As for the lone wolf that year, “[he] does not impede our

⁵ The committee women told me that women were elected to the *SESS* executive by default when nobody else was running for the positions. Although I completed my data collection in 1998, I know that the *SESS* president during the 1999/2000 academic year is female. Updated data indicate a more equal distribution of male and female student on the *SESS* executive since 1998.

⁶ The *Discover Engineering* committee has had a number of male members, as well as instructors (Table III).

progress.” All the women believed that because the committees had been established, it was up to the students to keep them functioning. As one woman remarked, “If I don’t do it, who will? Very few people in the college are willing to do all the (non academic) work that’s involved.” They were also concerned that, although they never had difficulty finding volunteers for a single project or a single school visit, “after us, there are [sic] nobody lined up to take over” the work of what they considered an essential service to the college.

Although the women took great pride and pleasure in their volunteer work, performing it came with a significant personal cost to their academic work, which, after all, is the “real” work in the college. “After Spectrum was over, my grades improved by 10%. Doing this work has compromised my grade point average. How will that affect my employment prospects?” said one *EEE* member who was graduating at the end of the term. She continued:

I had a job interview with [company], they were mean! It was intimidating, there was one of me and four of them - one female HR officer and three male engineers. The three of them,- the first two asked me questions relating to my extra-curricular activities, and the third was so horrific, I could barely believe it. He threw my résumé on the table and leaned back in his chair and said ‘I can’t even believe we are interviewing you! Look at your marks, you are such an oxymoron, all this extra-curricular activity, and your marks are just terrible.’ He asked the others why they had picked me and why they were interviewing me, ‘this is insane.’ I told him that my extra-curricular activity was important and that I learned more from that than I did from school. I explained that the skills I had in management, organization and communication were applicable to any situation, and that some of my courses were so specific that they couldn’t be applied to just any job. When it was my turn to ask questions, I asked why this marvelous company would condescend to interview me if all they looked for was marks. One of the other men admitted that he had once been required to withdraw, not because of extra-curricular work but because he was partying and failing. I never was required to withdraw! . . . I finally got up and left, I am not prepared to be belittled. I want to be valued for my skills. I took the next train home!

In other words, it is acceptable for a man to fail and rise from the ashes to become successful, while lower marks are detrimental to a woman’s career in spite of her other skills and abilities.

Even at the cost of some grade points, the women found the committee work rewarding, not least because of the friendships and social relationships they built within the groups. They also discovered that while they might be considered “insignificant” separately, when they worked together they became a critical mass and powerful.⁷ The faculty advisor for the *EEE* committee has indicated to me that this committee was absolutely essential to the recruitment of new engineering students and that it performed an invaluable service to the college. The increase in female enrollment over the years had justified the present general recruitment strategy instead of targeting female students. The fine-tuning of the school presentations, including the students’ production of a new video, and the skills the women have developed and honed over the years have exceeded the college’s expectations. According to the advisor, the work of this committee in the community outranks both in profile and prestige the efforts of the *SESS*, which essentially focuses on “entertaining” the students within the college.

Through their committee work the women developed other skills that would transfer well to their future working lives. They acquired assertiveness, and aside from the organization of the day to day work, they learned the importance of management skills such as meeting deadlines and completing projects, skills that are vital to their future work. They learned practical accuracy in budgeting and cost estimating of projects and how to present their projects for approval and funding. And above all, because each committee had a single purpose, they learned to focus on the task at hand.

One of the women illustrated the importance of communication skills by relating how her husband, also an engineering student, refused to attend social functions that did not involve engineers. She added

It is hard for all of us, and especially for the women, to maintain ‘a life’ or even normal relationships. The longer you’re here, the more isolated you become within your field. . . . If it weren’t for this committee

⁷ Former Saskatchewan MLA, Anne Smart once told me: “Around the Caucus table in the Legislature, my two female colleagues and I were told it was better if we did not sit together, as that would give us too much power.” As an MLA, Ms. Smart was one of only three women among 23 men in her Caucus. Cited with Ms. Smart’s permission.

work, we wouldn't know how to behave among 'normal people.'

Another benefit the women derived from their committee work was the recognition they received from their own college. They were recognized not because they were working within the college, and not because they took part in engineering competitions, but because they represented the college to the general public. The women also experienced a different kind of recognition when new students would approach them to ask questions and say they remembered them as having visited their school, or having guided their campus tours. "That gives you such a good feeling" one woman added. It was proof positive that her efforts were important.

The skills that this group of women acquired through their recruitment and outreach work will, in time, benefit society in general. One of them stated that the recruitment activities had become such an integral part of their daily lives, that the graduating students "didn't know what to do when it was over." Another woman responded that the committee activity had shown them the value of volunteering, and she expected that during their lifetimes, they would contribute their experience and expertise on hospital boards, fund-raising committees, alumni associations and other organizations. Through their outreach work they had found that this type of work was a source of friendships. There was power in numbers and women could do anything they set their minds to. They also realized that although an *SESS* executive position might provide more "glory," the "gut" work of their committees was as good as glory. The women had found a niche, a comfort zone, within a masculine arena.

DISCUSSION

The difference in socialization of females and males in our society has caused young women and men to choose different educational and career paths. Only recently has the College of Engineering seen a critical mass of female students. Even though the proportion of female students has increased, old attitudes are not easily erased. The more traditional *SESS* was rife with sexist and racist activities that reflected a masculine culture in the college. While forced to discontinue some of the more obviously objectionable activities, the *SESS* largely remains a male enclave. Past openly hostile attitudes toward women have left a legacy that still persists within the college. As recently as last December, engineering students were in the news in Saskatoon:

On the eve of the Dec. 6 Memorial . . . while escorting a group of children . . . on the university campus, I encountered engineering students chanting and marching. The leader shouted back: "Don't hand out the *Red Eye* just now." The rabble, dressed in red, marched military style. As the rear of the group came into contact with the young girls, one male yelled out, "Oh, it's little bitches" [1].

Pressure from government, and increased awareness of human rights issues propelled the College of Engineering to take corrective steps by using the women students already in the college to perform outreach and recruitment work to increase enrollment. This move gave the college high visibility in the community, and the women recruiters created the illusion of a large peer group of women in the college. This was a very successful and effective strategy with a minimal cost to the college administration.

There was a cost to the women, however. The time and effort involved in recruitment strategies were stolen from their course work and often resulted in lower grades. These lower grades were detrimental when seeking employment. Furthermore, the women received no money for their services, and they had taken the longer - and more costly - five-year course option to complete their programs.

For the women, being involved with the *EEE* also had a very positive outcome. They felt they were performing an important service to the college, and what they considered the rewards of their work came in the form of the skills they developed. The women noted repeatedly that the committee work taught and gave them skills that they could not and did not learn in the classroom. Among these skills was cooperation and team work. They worked well together, becoming friends and not competitors. They were able to develop communication skills because their work involved contact with individuals outside the engineering profession. They also learned practical management, budgetary and organizational skills that would make them valuable employees and community organizers. These were all work place skills that a guest speaker at the college's *McKenzie Banquet* had stressed as essential to success as engineers.

These practical skills have long been recognized as essential in the work place and it has been a lament of employers that college graduates have not been taught these skills in engineering and the sciences. How ironic, then, that some industry recruiters give so little credit to the students who have acquired them. This myopic view of the knowledge needed by engineers in the "real world" is detrimental to the education of engineers and the

profession as a whole.

The students' comments about engineers being *un*-gendered also raises issues that need examining. The development of engineering as an almost exclusively male domain has indeed *engendered* engineering--and the gender is male! Elsewhere in my study there is ample evidence that many areas of course work and the social environment retain a masculine culture. Could it be that when these women engineering students see engineering as *un*-gendered it is because they themselves have successfully become gender-*less*?

In an interview with eight professional women engineers who were academic engineering faculty and senior industrial managers, Linda Geppert [2] discussed the forces that caused female engineering students to deny their gender. As a consequence of the dearth of female mentors and role models and the denigration of women, women often believe that to be accepted in the masculine engineering profession they must adopt as many masculine traits as possible. While women in other professions and disciplines can assert that they can be both female and professionals, "women in engineering have successfully made themselves genderless. . . . They don't even recognize that they can say they have a gender, both to themselves and to others"[2 :44]. In such non-inclusive environments women are forced to deny their gender in order to succeed. In their training or education they adapt to and adopt the attitudes and values of the masculine professional culture [2].

There are both encouraging and discouraging issues around the efforts the female students invest by participating in outreach committees. It is encouraging that the women are creating their own visibility while being involved in promoting a field of study they enjoy. It is also important to present the university to the general public. On the other hand, it is discouraging, and a real irony that these women who have been trained in the masculine ways of engineers are sent out to recruit students, some of them female, who will continue to be trained the same way, because an engineer is an *engineer*, no gender, please. It is discouraging that the main focus of the recruitment is to increase total college enrollment (and tuition resources) and to mold the women to the profession rather than adjusting the profession to women.

Administrative attempts to welcome the female students in the college could be interpreted as an "*Illusion of Inclusion*" as the students' and the professors' own socialization mask the reality of female students' experiences in the college.⁸ Faced with exclusion from the *SESS* and the gender denying characteristics of the masculine culture in the college, the women engineering students had created a niche for themselves in the *EEE*. The women had cited the adage that "birds of the same feather flock together." Berger's [5:101-102] continuation "not as a luxury but out of necessity" was even more evident for this group. They had discovered that while they might be "insignificant" separately, when they worked together on the committees they became powerful as a critical mass.

In contrast to the masculine culture of the classrooms, labs and *SESS*, the *EEE* echoes the feminine culture. The women were nurturing the social, communicative, co-operative outreach function for the college. Within this safe place the women felt free to exercise the characteristics more often associated with feminine qualities. The gendered division of labour in the college is further exemplified by the scarcity of men attracted to the *EEE* work. The *EEE* also exemplifies "women's work" at another level. This work was largely unpaid and under-funded, as the students themselves had to raise outside funds for the programs. There was little status given to the work when it came to measure achievement as reflected in the lack of academic credit in the college or employability in the work force. "It's all guts and no glory" and "if I don't do it, who will?" has a familiar ring. How often have not women said the same about cooking, cleaning and child care: "If I don't do it, who will?" In this way, the College of Engineering replicates the division of labour in society and the exploitation of women's work.

CONCLUSION

⁸ I have taken this concept from Jacqueline Stalker and Susan Prentice's [3] work *The Illusion of Inclusion: Women in Post-Secondary Education* where they point out the many barriers women encounter when entering non-traditional fields. They particularly highlight the language used in class rooms and labs, examples in texts that are often irrelevant to women, and "joking" that makes women feel uncomfortable. These are the same issues that Sadker and Sadker [4] expose in elementary and secondary schools. Furthermore, the professors and other instructors are most often male. There is presently only one female engineering professor in the college. A woman holds an endowed chair in Communication, and there are women sessionals teaching the oral and written communication courses in year three.

As this paper has demonstrated, the female students provide a valuable, volunteer service to the College of Engineering. Their work on the recruitment and outreach committees has coincided with the increased number of women enrolling in engineering education. All the committee women stated that there was no place they would rather be than in the College of Engineering and the engineering profession. Their committee work was time consuming and could jeopardize their academic performance and extend their educational programs, but the intrinsic rewards for the work compensated for possibly lower grades and made them valuable team players in a profession where team work is a necessity.

The data for this paper derive from a specific group of engineering students and may not generalize to the typical engineering student, female or male. Ironically, the women's efforts essentially perpetuate the maleness of the engineering profession. As long as the women have to deny their feminine gender and become "one of the guys", the complete inclusion of women in engineering is, indeed, an illusion. The activities of the *EEE*, while valuable, are also underpaid and under-valued. This gendered division of labour perpetuates the denigration of women's work in society.

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After returning to post-secondary education as a mature student I became interested in education equity for women in university settings. My initial population of interest was Mature Female Students (my M.A.), which I expanded to Female Engineering Students for my Ph.D. research. I am now nearing completion of my study and look forward to take some time off to take an active part in the lives of my three young grandchildren. It will be quite a change from academics!