THE FUTURE OF ENGINEERING: A STUDY OF THE GENDER BIAS

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ABSTRACT. Women are under-represented in the engineering field. Although more than 50% of Canadian university students are female, they represent less than 25% of students enrolled nationally in engineering programs. Our study found that female high school students are as aware of engineering as a discipline as their male counterparts but are significantly less interested in pursuing a career in the field. Knowledge about engineering was correlated to having an engineer in the family but not to the type of schooling (co-educational *vs.* all-girls) the girls received. Our study also shows that our high school outreach program, Discover Engineering, has a positive effect on the interest of students, particularly female students, to consider engineering careers.

L'AVENIR DE L'INGÉNIERIE : UNE ÉTUDE DU SEXISME

RÉSUMÉ. Les femmes sont sous-représentées dans le domaine de l'ingénierie. Bien que plus de 50 % des étudiants des universités canadiennes soient des femmes, elles représentent moins de 25 % des étudiants inscrits à l'échelle nationale dans les programmes de génie. Notre étude a révélé que les filles fréquentant l'école secondaire sont tout aussi au fait de l'ingénierie en tant que discipline que leurs homologues masculins mais sont significativement moins intéressées à poursuivre une carrière dans le domaine. Les connaissances au sujet de l'ingénierie ont été corrélées avec la présence d'un ingénieur dans la famille mais pas avec le type de scolarisation des filles (école mixte c. école de filles). Notre étude montre également que notre programme de découverte de l'ingénierie dans les écoles secondaires a une incidence positive sur l'intérêt des élèves, particulièrement des filles, à considérer une carrière en ingénierie.

INTRODUCTION

Twenty to thirty years ago, the fields of medicine, law, and engineering were male dominated. Today, however, while medicine and law approach 50% participation by women, the field of engineering still remains less than 25% (*Women in science and technology*, 1991; Frize, 1992; *Canadian engineers for tomorrow*, 2003). There is little consensus among researchers about why this discrepancy still exists. Nor is it clear precisely when or at

what stage girls decide that engineering is not for them. Many studies have cited reasons for girls not choosing engineering as a career, such as the lack of role models, low self-confidence in the teenage years, streaming out of basic math and science, the lack of course preparation, the masculine image of engineering, the stress and isolation of being a minority, negative attitudes of male peers, lecturers and other staff, narrow course material, and concerns about combining a career with having a family (Hyde, Fennema, & Lamon, 1990; Lopez & Lent, 1992; Cronin & Roger, 1999; Wharton, 2001; Wolcott, 2001). Furthermore, as Tobias (1992) has argued, girls are not exposed to the same play environment as boys during their informative years. Finally, it has been suggested that a lack of exposure to toys such as mechanic sets and construction blocks leads to a reduced understanding of what engineering is all about (Lohan & Faulkner, 2004; Mellstrom, 2004). This lack of experience and hence knowledge could inhibit young girls from regarding engineering as a viable career choice. In order to increase the number of young women who choose to follow a career in engineering, it is important to ensure that they are as aware of opportunities in engineering as their male counterparts. Through the use of educational tools, such as mentoring programs, outreach projects, and career awareness conferences, it may be possible to increase the interest of young women in the engineering field (Hazzan, Levy, & Tal, 2005).

At Ryerson, we were interested in knowing what young women in the Toronto area knew and felt about careers in engineering. Therefore, in this study, we set out to collect the following information: the level of knowledge of high school students (boys/girls) about engineering; the percentage of boys/girls interested in pursuing a career in engineering; and the effect of co-ed *verses* all-girl high school environments on young women's decision to pursue engineering as a career. We also examined the effect of having an engineer in the family and, lastly, the effect of increasing the students' knowledge of engineering through a high school workshop program. The responses obtained from the females at co-ed and all-girls schools were compared and also compared to the male responses to see if gender bias towards engineering exists in high schools today.

BACKGROUND

Ryerson University has addressed the question of how to recruit and retain women in university engineering programs for more than a decade. The Women in Engineering (WIE) Committee at Ryerson was formed in 1989 with the objective of providing education to students, especially young women, about the fields of engineering and showing them that it can be a suitable career choice. The WIE Committee initiated the Discover Engineering (DE) program in 1991. Our first initiative was the Discover Engineering Summer Camp for high school girls, which aimed to introduce girls to the

challenges and rewards of engineering through the use of hands-on, brains-on activities and to thus motivate them to choose engineering. We found more than three-quarters of the girls indicated that the program made a significant difference to their awareness of what engineering was all about (Gilbride, Kennedy, Waalen, & Zywno, 1999). Follow-up surveys on these same girls three to five years later indicated that approximately 60% had gone on to pursue engineering undergraduate degrees (Gilbride & Gudz, 2000). Discover Engineering has been very successful and continues to provide a valuable resource to girls who may be inclined to pursue engineering but need some reassurance that this is a valid path. At Ryerson, we have seen a significant increase in female undergraduate engineering enrollments, from 7% in 1990 to 17.2% in 2001 (*Canadian engineers for tomorrow*, 2002). This increase is in part due to the enrolment of many girls who had previously attended the camp program.

The WIE committee also initiated several other activities within and outside the Faculty of Engineering and Applied Science to provide support to the young women who had already chosen engineering as their undergraduate program. These activities include a welcoming soirée, an e-mail-based mentoring program (Mentor-Link), a one-day career conference for high school girls, and a staffed WIE office for drop-in consultations. These activities have been discussed elsewhere (Anderson & Gilbride, 2002; 2003).

Although all the programs have been highly successful, the WIE committee also felt that all high school students should be exposed to engineering career information and therefore launched a high school workshop program which brings Discover Engineering directly to the classroom (Zywno, Gilbride, & Gudz, 2000; Anderson & Gilbride, 2003). This initiative was designed to raise awareness about careers in engineering among all high school students (both male and female), to break down related stereotypes (by having the workshop lead by female professors, engineers, and students), and to promote opportunities for women in "non-traditional" fields.

Since the DE high school program reaches more than 1000 students every year, the program created an opportunity to survey the knowledge and interest of high school students towards engineering and allowed us to compare responses between boys and girls. The study design consisted of a pre-test-post-test group (Frehill, 2003) that included comparisons by gender and by school environment (single-sex or co-ed). Through the use of questionnaires and evaluation forms, we were able to study the level of knowledge about engineering and interest in pursuing engineering careers that the students already possessed before they participated in the workshop and whether they believed there was an increase in their knowledge through their participation. Secondly, since environment can influence knowledge (Chan, Stafford, Klawe, & Chen, 2000), we also looked at two environmental factors in the

students' lives – the presence of a role model (an engineer in the immediate family), and whether the educational setting of the young women (co-ed *vs.* all-girl schools) had an effect on their knowledge or interest. We focused on these factors because these are among the issues that recent research has shown to influence women's career development (Triplett, Husman, & Hong, 2005; Townsend, 2002). Although we realize that this study would not address all of the issues cited as reasons for women not to choose engineering, to ensure that the questionnaires and evaluation forms would be completed during the program we also had to use questions that would be easy to answer and not take up too much time to fill out. This also limited the number of issues that could be addressed.

The DE high school workshop program is delivered to both male and female high school students from grades 9 through 13 in a classroom setting. Although some research indicates that young women need to be introduced to engineering at a younger age to influence their career decisions, Blaisdell's (2000) study of 245 high school students showed that the intent to major in engineering often occurs during high school, and therefore interventions that target that age group are an effective technique for recruiting women into engineering. Therefore, we felt that the high school age group was often still undecided about their future career choice and could be influenced by receiving career information.

Although providing information to students was our intention, we also wished to monitor the attitude of the participants towards engineering both before and after the workshop. We felt that obtaining the information that we sought from a younger age group would be difficult. We also felt that part of the reason that girls may not be entering engineering programs at the university level is their lack of knowledge about the profession and its opportunities for women. Lastly, although our specific concern was the attitudes of young women, the boys in the class were also polled to assess their attitudes and the influence of an intervention program such as ours. Therefore, during our initiative we hoped to address several questions:

1. How knowledgeable of and interested in engineering were Toronto-area high school students (boys/girls) ?

2. How did having an engineer in the family increase knowledge of or interest in engineering?

3. How did girls' educational environment (all girls *vs.* co-ed) influence knowledge of or interest in engineering?

4. Lastly, did participation in the workshop help increase the students' knowledge of or interest in engineering?

Our overall objective was to educate students about engineering; our research goal was to survey the attitudes and knowledge of high school students and to determine if there was a gender-related difference among responses.

METHODS

Study design

To accomplish our goals, we asked the students to fill out short questionnaires before the workshop and a short evaluation at the end. The survey was conducted over the academic year 2000/2001, and included almost 1200 high school students representing 20 different high schools in the Toronto area. The students represented the fundamental demographic characteristics of the multicultural city; however, no race/ethnicity or socioeconomic data were collected for this study. The gender ratio was 48% male to 52% female. Of the female students participating, 66% attended co-ed schools and 34% attended all-girl schools.

Design of workshops and modules

The program was delivered to students during regular class time and had not been previously advertised to or selected by the students. The workshops were approximately one hour, each beginning with a questionnaire, followed by a brief presentation describing the purpose of the workshop, defining and giving examples of engineering at work, and outlining opportunities in engineering today. The presentation was followed by a hands-on classroom activity (described in the following section) and, finally, the students were asked to fill out an evaluation form. The workshops were led by female engineering students, engineers, and faculty to provide positive role models for the high school girls in the audience.

Either of two modules was used in the workshop format. Restrictions placed on the design of a structure to be built in the module or on the individuals doing the activity were implemented to mimic real life situations where money, time, and individual expertise can affect the overall outcome of the engineered designs. Both modules were designed to show how cooperation within an engineering team benefited the overall outcome of the activity

In the Engineering Design Activity, the students were divided into teams of three or four, given a problem, and asked to design and test their solution. In this exercise, the teams were required to budget, draft a design, and build a structure that would contain an egg and protect it from cracking when dropped from a ten-foot height. They were given 30 Discover Engineering dollars and could only purchase items from the Discover Engineering store for their structure. This exercise promotes group work and problem-solving skills.

In the Engineering Challenge Activity, the students were divided into groups of four and given drinking straws and marshmallows with which to build a structure. Each one within the group was assigned a specific role, i.e., use of left hand only, inability to talk, use of scissors only, use of marshmallows only, etc. Each person had to adhere to her/his job description or the team lost points. The object was to build the tallest free-standing structure possible within a specific time limit while retaining points. This exercise promotes co-operation within the group, teamwork, and problem solving skills.

Evaluation of pre-workshop knowledge of students

The pre-workshop questionnaire consisted of six questions. The first two asked students their gender and current level of high school. The third question asked them to rate their interest in becoming an engineer by checking one of the following responses: yes; probably; not sure; not likely; no. The fourth question asked them to indicate how many people in their immediate families were engineers by checking all of the responses that were applicable: none; 1 female; 1 male; 2 females; 2 males; other. The fifth question asked them to indicate how much money they thought an average engineer makes per year: $30,000-40,000; $40,000-50,000; $50,000-60,000; $60,000-$70,000; $70,000-$80,000; >$80,000. This question was removed from the evaluation after we looked at the data, since we had not specified at what stage the engineer was in her/his career, and therefore the students were not basing their answers on the same scenario. The last question assessed the knowledge of the student by asking them to describe in their own words what an engineer does; if they were not sure, they were asked to write "not sure." Of the students who gave responses, we categorized those responses into: correct; not correct; not sure.

Evaluation of the effect of the workshop on students

Once the students had heard the presentation and completed the modules, they were asked to fill out evaluation forms. They were again asked (questions 1 & 2) to indicate whether they were male or female and their grade level so that responses could be grouped by gender and year. The next two questions (3 and 4) were rated from 1 to 5, with 1 being "not at all"; 2 was "a little"; 3 was "so-so"; 4 was "yes"; and 5 was "very much." Questions 3 and 4 asked if they found the workshop interesting and if they found the presenters enthusiastic and helpful respectively. Question 5 asked the participants to rate whether they thought the workshop had increased their knowledge about engineering and what an engineer does. And question 6 asked the participants to rate their interest in engineering as a career option now. The evaluation form finished with asking the students if they would recommend participation in the workshop to a friend (yes or no) and if they had any comments or suggestions.

Statistical analysis of data

Percentages were calculated for all categories. Positive responses were calculated by including both "yes" and "probably" percentages. Chi-Square analysis was preformed to determine whether there were significant differences between groups of students in the responses given.

RESULTS AND DISCUSSION

Effect of gender on knowledge about engineering

Questionnaires completed before students participated in the DE workshop gave us information regarding the level of knowledge and interest students had about engineering prior to completing the modules. Of the students who completed the question asking them to describe what an engineer does, 49% indicated that they were not sure, while 19% gave incorrect descriptions, and only 32% knew what an engineer does (Table 1). The most common incorrect description given was that an engineer *"fixes things."* This description was deemed too vague. Other examples of incorrect descriptions included: *"I think an engineer is a person who works with engines"; "I think they fix things like cars."* The most common correct description given was that *"engineers design and build things."* Other examples of correct descriptions included: *"An engineer designs things and puts them together to make them work"; "An engineer comes up with innovative ideas and solves problems."*

Group	Not sure	Incorrect	Correct	Answered
Total Males & Females, n=1183	49%	19%	32%	51%
Males, n=569	43%	22%	36%	58%*
Females, n=614	54%	17%	29%	46%*
Co-ed Females, n=405	54%	18%	29%	47%
All-girl Females, n=209	55%	14%	31%	45%

*Significantly different at p<.01

TABLE 1. Comparison of the knowledge of engineering by gender prior to Discover Engineering High School Workshops

Overall, male students appeared to be more confident in venturing an answer, but not necessarily more knowledgeable. This is indicated by the fact that more male students attempted to define engineering (fewer male students indicated "not sure"). The percentage of male and female students that gave correct definitions, however, was not significantly different, with 36% of males and 29% of females correctly defining an engineer (Table 1). We felt that the girls might not be as likely to give a definition if they were not confident that it would be correct (Frize, 1998; Babcock & Laschever, 2003). Although this factor was not tested in our study, other research has

shown that female students indicate both lower interest and perceived ability than their male classmates in areas such as computer science, engineering, and physics (Chan, Stafford, Klawe, & Chen, 2000; Blaisdell, 2000). Francis (2002) found that although junior high school boys and girls had high occupational aspirations, both sexes upheld gender stereotypic views of careers, and only 10% of girls compared to 34% of boys reported that they were interested in technical/scientific jobs. Furthermore, Armour and colleagues (2002) conducted a survey of high school students and concluded that they have little knowledge about what a scientist is and that gender stereotypes permeate high school student perceptions of scientists. Overall, in our study, we found that only 32% of the high school students knew what an engineer did and that both the female and male students had the same level of knowledge.

Effect of environment on knowledge of engineering

The educational environment had little effect on the knowledge of the girls, with 31% of girls from all-girl schools compared to 29% of girls from co-ed schools giving correct definitions for an engineer. Although there is conflicting evidence about single-sex education, there is a general perception that girls fare better in math and science in all-girl environments (Zywno, Gilbride, & Gudz, 2000; Gilbride, Waalen, Kennedy, & Zywno, 1998; Davies, Ginorio, Hollenshead, Lararus, & Rayman, 1996). Based on these theories, it might be hypothesized that girls that do better in math and science may be more knowledgeable about careers such as engineering and, therefore, we might expect to see fewer "not sure" answers from students from all-girl school environments, as they should be more inclined to attempt to give a description. However, the level of responses was virtually the same, with 55% of female students from all-girl schools compared to 54% of girls from co-ed schools indicating "not sure."

Effect of role models on knowledge

We also examined the effect of having an engineer in the immediate family. Overall, 43% of the students knew what an engineer was when there was an engineer in the family compared to only 27% of students with no engineer in the family. This was not surprising, since exposure to role models is a key element in gaining knowledge about any career choice. The knowledge of the students was higher regardless of whether the role model was male or female (Table 2). This would indicate that any engineering role model provides adequate information about the profession. However, when males and females were examined separately, it is worthy to note that 43% of the girls knew about engineers when the role model was female compared to 40% when the role model was male. On the other hand, 46% of the boys knew about engineers when the role model was male compared to 36% when the role model was female. However, the sample sizes of students with female

engineers as role models were small, and therefore the significance of these differences could not be assessed.

Group	Not sure	Incorrect	Correct
Total males and females with no engineers, n=778	53%	19%	27%*
Total males with no engineers, n= 365	47%	22%	31%*
Total females with no engineers, n= 413	59%	17%	24%*
Total males and females with 1+ engineer, n= 377	39%	18%	43%*
Total males and females with 1+female engineer, n= 50	46%	14%	40%
Total males and females with 1+male engineer, n= 309	38%	19%	43%
Males with 1+ engineer, n= 190	35%	21%	44%*
Males with 1+female engineer, n= 20	45%	20%	35%
Males with 1+male engineer, n=163	33%	21%	46%
Females with 1+ engineer, n=187	43%	16%	41%*
Females with 1+female engineer, n =30	47%	10%	43%
Females with 1+male engineer, n=146	43%	17%	40%

* Significantly different at p<.01

TABLE 2. Effect of having an engineer in the family on the knowledge of engineering among the students

Effect of knowledge on interest in pursuing an engineering career

We examined whether the students who gave correct definitions of engineering were more likely to be interested in pursuing engineering as a career (Table 3). Overall, 30% of the students indicated that they would be interested in pursing engineering; however, the students that had knowledge of what an engineer does were more inclined to express an interest (36%). Forty-six percent of the male students compared to 16% of the female students indicated that they were interested in pursuing engineering, and having knowledge significantly increased the likelihood that they would choose engineering, to 49% in males and 23% in females. However, knowledge itself was not enough for the female students to indicate as much of a desire to enter engineering as their male counterparts, since half as many girls as boys wanted to pursue engineering as a career. Furthermore, only 16% of girls in either all-girl academic environments or co-ed environments indicated that they would choose engineering; and, although knowledge increased their interest, it did not have more impact in one environment compared to the other, with 21% of the girls in all-girl schools and 23% of girls in co-ed schools indicating an interest in choosing engineering as a career.

Effect of role models on interest in pursuing an engineering career

A previous survey of girls who attended the Ryerson Discover Engineering summer camp indicated that family had been the number one influence on their career decisions (Zywno, Gilbride, & Gudz, 2000). Other studies have cited socialization within a family, such as having a parent or close

Group	Yes	Probably	Y+P	So-so	Not likely	No
Total males and females, n=1197	16%	14%	30%	30%	21%	19%
Total males and females with knowledge, n=381	21%	15%	36%	30%	18%	16%
Total males, n=574	27%	19%	46%*	30%	13%	11%
Total males with knowledge, n=202	34%	15%	49%*	30%	12%	9%
Total females, n=623	5%	11%	16%*	30%	28%	26%
Total females with knowledge, n=179	7%	16%	23%*	30%	23%	24%
Co-ed females, n=414	5%	11%	16%	28%	27%	29%
Co-ed females with knowledge, n=120	6%	17%	23%	30%	22%	25%
All-girl females, n=209	6%	10%	16%	33%	31%	20%
All-girl females with knowledge, n=65	8%	13%	21%	30%	27%	22%

* Significantly different at p<.01

TABLE 3. Comparison of the interest in pursuing engineering of students in general, students who knew what engineering was, and female students in co-ed vs. all girl schools

relative who is an engineer, as likely to influence a young girl's decision to choose non-traditional careers (Baignee, 1990; Blattel-Mink, 2002). In this study, we examined that issue further by determining if there was a correlation between having an engineer in the family and a high school student's decision to pursue engineering (Table 4). Overall, 40% of students with an engineer in the family compared to 25% of students without an engineer in the family expressed an interest in pursuing engineering. However, when females were compared to males, 55% of boys with at least one engineer in the family indicated that they would like to pursue engineering compared to 40% of boys without an engineer in the family, while 24% of girls with at least one engineer in the family expressed the same interest compared to 12% of girls who had no engineer in the family. This data show that a role model in the family does have an impact on the students' desire to pursue engineering. However, regardless of the role model, boys were found more likely to choose engineering than girls. This statement is substantiated by the fact that 40% of the boys without engineers in the family indicated that they were interested in pursuing engineering compared to 24% of the girls who had engineers in the family. However, 40% of the female students with female engineers in their family were interested compared with only 22% of female students with male engineers in their family. This reinforces the importance of female role models in career decisions by female students.

Effect of participation in workshop on interest in pursuing an engineering career:

After participating in the workshops, the students completed a post-program evaluation. This allowed us to assess the impact of the program on the students' knowledge of engineering and interest in pursuing engineering as a career (Table 5). Seventy-five percent of the students indicated that the program increased their knowledge about engineering and over 40% indicated that the program increased their interest in pursuing engineering as a career. For

male students, over 70% indicated that the program increased their knowledge about engineering, and over 50% indicated that the program increased their interest in pursuing engineering as a career. For female students, 80% indicated that the program increased their knowledge about engineering, and almost 40% indicated that the program increased their interest in pursuing engineering as a career. Therefore, although the program had more effect on the female students' knowledge of engineering, they were still less inclined to indicate a desire to pursue engineering than their male counterparts.

Group	Yes	Probably	Y+P	So-so	Not likely	No
Total males and females with no engineers, n=791	13%	12%	25%*	32%	24%	19%
Total males with no engineers, n= 370	23%	17%	40%	32%	16%	12%
Total females with no engineers, n= 421	4%	8%	12%*	31%	31%	26%
Total males and females with 1+ engineer, n= 406	21%	19%	40%*	26%	17%	17%
Total males and females with 1+female engineer, n= 50	32%	20%	52%	16%	20%	12%
Total males and females with 1+male engineer, n= 310	20%	19%	49%	26%	16%	19%
Males with 1+ engineer, n= 204	34%	21%	55%	25%	10%	10%
Males with 1+female engineer, n= 20	55%	15%	66%	20%	5%	5%
Males with 1+male engineer, n=141	30%	22%	52%	24%	12%	12%
Females with 1+ engineer, n=188	8%	16%	24%*	27%	23%	26%
Females with 1+female engineer, n =30	17%	23%	40%*	13%	30%	17%
Females with 1+male engineer, n=147	7%	15%	22%*	29%	22%	27%

* Significantly different at p<.01

TABLE 4. Effect of having an engineer in the family on interest in pursuing engineering

Group	Increased knowledge	Increased interest
Total males and females, n=1152	75%	44%
Total males, n=532	71%	51%
Total females, n=620	80%	38%
Co-ed females, n=407	76%	34%
All-girl females, n=213	87%	47%

TABLE 5. Impact of the Discover Engineering High School Workshops on knowledge and interest in pursuing engineering

When the students attending all-girl schools were compared to the female students from co-ed schools, we found that 31% more young women at all-girl schools indicated an interest in engineering after the workshop, whereas only 18% more young women in the co-ed classrooms became interested. This was a bit of a surprise, since prior to the workshops the female students from both school systems showed no difference in their interest.

In order to assess the potential effect of the workshop program on future engineering enrollments, interest in pursuing engineering before and after the workshops was directly compared (Table 6). While there was a small increase in interest by male students, the interest level more than doubled from less than 20% to almost 40% for female students. This reinforces the theory that misconceptions about the true nature of engineering still act as barriers preventing women from considering such a career (Anderson & Gilbride, 2005; Knight & Cunningham, 2004; Zywno, Gilbride & Gudz, 2000; Gilbride, Waalen, Kennedy, & Zywno, 1998). Once students become aware of the broad range of engineering fields and what an engineer does, they become more interested.

Group	Pre-Workshop	Post-Workshop	Increase
Total males and females	31%	44%	+13%
Total males	46%	51%	+5%
Total females	16%	38%	+22%
Co-ed females	16%	34%	+18%
All-girl females	16%	47%	+31%

TABLE 6. Comparison of interest in pursing engineering as a career, before and after workshops

When the students attending all-girl schools were compared to the female students from co-ed schools, the increase in interest was even higher among students from all-girl schools, with 47% of the students interested after participating in the workshop. This increase brought the level of interest in line with that of the male students, of whom 51% expressed an interest after the workshop.

CONCLUSIONS

While there still exists a gender bias against pursuing engineering as a career, female engineering role models and outreach programs can significantly increase the interest in engineering among female students.

Our study has shown that while female students have the same level of knowledge about engineering as their male counterparts, their interest in pursuing engineering as a career is much lower. In particular, girls in all-girl schools were not more knowledgeable than girls in co-ed settings and no more biased towards engineering careers.

Our study found that having an engineer in their immediate family had a significant influence on the students' knowledge about engineering. Having an engineer in the family also had a significant influence on interest in pursuing engineering as a career, and a female role model provided the greater influence for the female students.

Overall, participation in outreach programs, such as Discover Engineering, has been found to significantly increase the female students' interest in pursuing engineering as a career (Hazzan, Levy, & Tal, 2005), and our study has found that an all-girl environment can bring the level of interest in line with the values for the male students.

The potential effect of the workshop program on future engineering enrollments is also significant. Of the almost 1200 students participating in the 2000/2001 program, more than 500 students indicated that they would consider pursuing engineering, with 150 of them becoming interested due directly to participation in the workshop program. When reviewed by gender, there was a small increase in interest by male students, while the interest level more than doubled for female students. Based on the number of students participating in the 2000/2001 program, there were an additional 15 male and 135 female students interested in pursuing engineering due to participation in the workshop program. Future studies should include a follow up of the high school students that participated in these programs to determine how many actually enrolled in engineering programs in university.

By providing information and role models, Discover Engineering is overcoming some of the challenges facing recruitment of females into engineering.

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