The Invisible Society of Women in Technology: Young Women's Reluctance to Enter the Technology Field

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Abstract

In April of 2000 the American Association of University Women (AAUW) published a startling report about how our young women are not only falling through the cracks of the information superhighway, but are not even interested in the technology field. The worry has been that our girls are computer-phobic. What the Commission on Technology, Gender, and Teacher Education discovered is that girls are computer reticent. The Executive Summary of *TECH-SAVVY—Educating Girls in the New Computer Age* focused on key themes to investigate and offered suggestions for creating mentorship programs and educational curricula that would address these issues.

With the creation of programs that offer different strategies to attract more females to the technology field, the issue of our young women falling through the cracks of the information superhighway will at least be addressed. We need cooperation between academic institutions, middle, high school and university, and our corporate world. Mentorship programs, leadership workshops, and committed leaders need to take action now to stop the trend that's not only lowering the glass ceiling, but also once again creating an invisible society of women.

Keywords: Women, technology, computing, computer reticent, mentorship programs, glass ceiling

In April of 2000 the American Association of University Women (AAUW) published a startling report about how our young women are not only falling through the cracks of the information superhighway, but are not even interested in the technology field. The worry has been that our girls are computer-phobic. What the Commission on Technology, Gender and Teacher Education discovered is that girls are computer reticent. The Executive Summary of the *TECH-SAVVY—Educating Girls in the New Computer Age* focused on key themes to investigate. These key themes were:

1. Girls have reservations about the computer culture—and with good reason.
2. Teachers in grads K-12 have concerns—and with good reason.
3. Statistics on girls' participation in the culture of computing are of increasing concern, from the point of view of education, economics and culture.
4. Girls' current ways of participating in the computer culture are a cause for concern (AAUW, p.ix-x, 2000)

> Girls in the focus groups explain that building human relationships is as intellectually complex and valuable as understanding machines; they question boys' absorption with computers as a substitute for social skills. As one high school student put it, "Women are into talking to each other and building these relationships, and guys—they are not as comfortable with themselves or with each other. They just like to build a relationship by putting it into the computer." (AAUW, p.9, 2000).

Girls want to make a difference within the social structure, rather than playing with machines. Girls are not making the connection that technology is integrated with all aspects of life—social, philosophical, financial, and cultural. By not making this connection, girls are missing the opportunity to fulfill their need to contribute to society by avoiding entrance into the technology field.

In a project conducted by Suzanne Silverman and Alice Prichard—Connecticut Women's Equity Research—in 1996, other startling findings were discovered that contributed to the gender gap. The authors discovered that middle school girls were discouraged from taking more technology education in high school because of two major factors that tend to reinforce each other. First, technology has until recently, been a field dominated by men. They found evidence that traditional stereotypes about male/female occupations

are still operating are strong enough to outweigh girls' positive feelings about their experiences in technology education classes.

Second, they found that girls were uninformed about economic realities and the world of work. They lacked basic information about careers, including any sense of salaries, promotion prospects or the amount of education and training needed to pursue different occupations. While boys and girls may share this lack of information, for girls it is combined with stereotypes about technology as a male occupation, which reinforces their reluctance to consider nontraditional occupations (Silverman & Prichard 1996).

The lack of information and the emergence of sexism among peers at the middle school level are influencing girls to more readily accept stereotypical roles. Because of this gender-pressure fewer girls are pioneering the information superhighway. Our electronic covered wagons are unfortunately being lead by a stereotypical profile of a white male nerd. Females are delegated to the back of the wagon, out of sight and out of mind, invisible. Research by Hill and Wheeler (1991) for STEM (Status of Women in Science, Technology, Engineering, and Mathematics) has revealed the following stereotypical profile for scientists and technicians is a male Caucasian with wild hair wearing glasses. In the rare case where a woman is projected, she appears plain and innocuous. This profile is not very appealing to a young woman wanting to enter into society to change the world. Our girls are not only pressured early in their education to avoid the science field, but unfortunately also lack education about technology that includes strong women leaders established in business or education. Girls are achieving or exceeding technology requirements but are not making the connection between what they are learning and the real business world.

These startling results are causing institutions across the nation to analyze the numbers of girls entering their programs and the retention rates. At Purdue University, Calumet, the Information Systems Computer Programming (ISCP) Department recently completed a report reflecting graduate student information. This analysis showed that while the Calumet Campus showed a student graduate population of 43% male and 57% female, the ISCP department graduated 60% male and 40% female (Appendix A. Table 1). These numbers add to the evidence that we are losing our young women to fields other than technology.

This gap in the education of young women is a major concern in groups of educators. One way to correct this gap is to provide a program of mentorship between girls and professional women. One of the key recommendations offered by the AAUW is to "support efforts that give girls and women a boost into the pipeline." (AAUW, p.3, 2000).

The Women's Studies Program at Purdue University Calumet answered this charge by creating the TEAMS Leadership Institute. The mission statement of TEAMS is:

> Our Mission is to aid current and future leaders in the fields of technology, engineering, architecture/construction, mathematics and sciences in overcoming gender-related issues common in business environments by providing pertinent education and information, appropriate networking opportunities and experiences, and general support in aiding leaders as they develop essential skills to support lifelong success (TEAMS, p.1, 2000).

The TEAMS Leadership Institute began as an initiative at Purdue University Calumet under the guidance of a cross-functional program, Woman's Studies. Although trends are changing, women are highly under-represented in areas of leadership in fields that are considered technical or scientific. The acronym TEAMS stands for the specific areas of Technology, Engineering, Architecture/Construction, Mathematics, and Sciences. These fields all exist as areas of academic study on Purdue's Calumet campus. The TEAMS effort has stemmed from the Women's Studies program and the personal interest of faculty in their respective fields. The faculty realized that while students are trained technically when they graduate from the Purdue Calumet program, the amount of training and leadership skills would vary, depending on the program curriculum. With this in mind, a leadership institute seemed like a logical choice for assure a technically component professionals are given the opportunity to sharpen their leadership skills. Business leaders are invited to user their resources to improve their internal organization, identify future leaders and improve their own skills by encouraging their employees to participate. The future business leaders are offered workshops, mentoring opportunities, scholarships and networking opportunities. The TEAMS Leadership Institute focuses on the technical professions of Technology, Engineering, Architecture/Construction, Mathematics and Sciences with regard to gender issues. While the institute concentrates on many general leadership applications, it will focus also on issues that apply to gender.

One of the first efforts of the TEAMS Leadership Institute was to establish an E-Mentoring Program that connected Purdue University Calumet female students with a female business leader using email and the method of communication. Eligibility re-

quirements were established to establish a framework for the student and the business leader to follow.

TEAMS Connections Eligibility Requirements for becoming a Protégé or Mentor

Basic requirements for becoming a college student protégé:

- You are pursuing or considering a degree or certification in a field related to Technology, Engineering, Architecture, Mathematics or theSciences.
- You are interested in corresponding on a regular basis with a person currently working in the field you are considering to pursue.
- You have an e-mail address that will be (at minimum) active for the remainder of this academic year.

Basic requirements for becoming a mentor:

- You are a professional with an educational or professional background in a field related to Technology, Engineering, Architecture, Mathematics or the Sciences.
- You are interested in corresponding on a regular basis with a college student who is studying (or at least considering study) in your professional area.
- You have access to an e-mail address that will be (at minimum) active from now through the end of next May (TEAMS, p.1, 2000).

After a match was made, the student and mentor communicated via weekly email for the academic year. At the conclusion of the academic year, a Sunday brunch will be hosted by the TEAMS Leadership Institute so that all participants will have an opportunity to meet face-to-face and share their experiences. It is expected that most participants will participate in this event. Commitment to participate in the program does not require any additional face-to-face contact or phone contact with your match, however many of the local participants do choose to meet at some time throughout the year. This option is left completely to the discretion of the participants and is not expected as a requirement of the program. The TEAMS Leadership Institute sponsored a workshop untitled: *Introduction to the Inner Work of the Leader. Presented by Trustee Leadership Development*. This workshop was aimed for current and future leaders especially those who want to continue to expand their leadership skills and enhance their spheres of moral and ethical influence. The main focus of the workshop was to challenge work responsibilities, participation in community service, education opportunities and take time for reflection and insight into life events and choices that have shaped who we are – all essential elements in the ongoing development of exceptional leaders. Only through such reflection and analysis can we gain the key to understanding our leadership roles and increase our awareness of self and our influence on others. Leadership skills must constantly evolve in order to meet the changing needs of our times *Introduction to The Inner Work of the Leader* is a unique way to continue to develop ourselves as leaders. Through individual reflection and analysis, discussion, and small and large group activities, this on-day workshop aided participants in defining their roles as leaders within their organizations and communities.

CONCLUSION

With the creation of programs that offer differ strategies in order to attract more females to the technology field the issue of our girls falling through the cracks of the information superhighway will at least be addressed. We need cooperation between academic institutions, middle, high school and university, and our corporate world. Mentorship programs, leadership workshops and committed leaders need to take action now to stop the trend that's not only lowering the glass ceiling, but also once again creating an invisible society of women.

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Appendix A
Table 1
Information Systems Computer Programming (PCU) Graduates by semester, average age at graduation, gender and ethnicity Fall 1995–Fall 2000

ISCP GRADUATES BY SEMESTER, AVERAGE AGE AT GRADUATION,
GENDER AND ETHNICITY FALL 1995 - FALL 2000

Semester	Year	Grads	Age	Male	Fem	Amer Ind	Wht NonH	Blck NonH	Asian PAISL	Hsp	Oth	NA
FALL	1995	26	30	14	12		24			2		
SPRING	1996	48	31	33	15		40	3	1	4		
SUMMER	1996	6	35	3	3		5		1			
FALL	1996	26	33	11	15		19	2	2	3		
SPRING	1997	31	31	13	18		22	2	3	4		
SUMMER	1997	5	35	2	3		4		1			
FALL	1997	29	35	18	11		25	2	1	1		
SPRING	1998	50	32	27	23	1	36	6	2	5		
SUMMER	1998	14	31	11	3		12	1		1		
FALL	1998	24	31	18	6		20	1	1	2		
SPRING	1999	43	30	30	13		32	2	1	6		2
SUMMER	1999	10	31	6	4		9	1				
FALL	1999	27	28	18	9	1	22		3	1		
SPRING	2000	68	32	33	33		49	6	3	7	1	2
SUMMER	2000	16	28	14	2		11	1	1	3		
FALL	2000	63	29	38	25		46	2	5	10		
Total		486	31	289	195	2	376	29	25	49	1	4
PCU												
FALL	2000	8541		3664	4842	37	5982	1041	157	1107	137	