Cultivating Greater Acceptance of Women in Technology: A Pilot Study

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ABSTRACT

Many Western nations face a critical shortage of skilled professionals in science, technology, engineering and mathematics (STEM). However, despite abundant opportunities, few women prepare themselves for careers in these fields. Several of those concerned with the problem have proposed that new media programming, such as television dramas with women engineers, computer professionals and/or engineers in leading roles, might help attract more women to STEM fields. This article identifies a theoretical rationale for a media-centered strategy, and describes a pilot study whose data suggest that a media-centered approach might have some success in producing greater interest among women in pursuing STEM careers, particularly information technology (IT) careers.

Keywords: gender; information technology; media; STEM careers; women

INTRODUCTION

“It is still news whenever women tackle any job American society traditionally has seen as male” (Vavrus, 2002, p. 11). In July 2005, 15 major American business groups, led by the Business Roundtable, issued a joint statement decrying the declining prominence of the United States (US) in STEM, and calling for the nation to double the number of college graduates in those fields by 2015. The statement cited data indicating that more than 50% of the current US science and engineering workforce is approaching retirement age and that by 2010, if present trends continue, the vast majority of all scientists and engineers in the world will be living in Asia. The report claimed that the scientific and technical capacity of the US has already begun to atrophy, threatening America’s standard of living at home and leadership in the world (Business Roundtable, 2005). Corresponding concerns for their nation’s welfare and standing in the global political economy have
been expressed in many countries throughout Western Europe (Femtec, 2002).

It is widely understood that part of the solution to the escalating problem of the shortage of well-trained technical personnel in all advanced industrial nations involves attracting considerably more women to careers in STEM disciplines. In the US, there is substantial occupational segregation by sex. Although women constitute 46% of the labor force, less than one-quarter of the scientists and engineers in the country are women (Mervis, 2000). Precise international comparisons of occupational segregation are difficult, because nations seldom use comparable detailed occupational coding systems (Jacobs, 1993, p. 133). However, available data indicate not only the existence of such a gendered division of labor throughout Western Europe, but also the likelihood of its persistence. For example, while half of all university students in Germany are women, women represent only 34% of all students in the natural sciences and 19% of all students in engineering (Femtec, 2002, p. 2). Similarly, men were found to be over-represented among computer science graduates in all 21 industrial nations considered in a recent study. In the US, the “male over-representation factor” is 2.10; United Kingdom, 3.10; France, 4.57; and Germany, 5.58 (Charles & Bradley, 2005).

Approximately half the potential STEM talent pool consists of women. Therefore, in 2000, a US government commission was charged with developing strategies to attract more women and minorities in STEM careers. The commission reported to the Committee on Science of the House of Representatives that significant barriers to these goals persist (Committee on Science, 2000). Such deterrents range from differing male/female attitudes toward science and technology that begin to diverge as early as elementary and middle school to the absence of women faculty, mentors and fellow students in college and university classrooms that create a “chilly climate for women” in these areas (AAUW, 2000; Seymour, 1999).

In the field of IT, career opportunities for women abound. Yet despite the obvious advantage of entering this area, there has been a steady decline in the number of computer science bachelors degrees awarded, particularly to women (Camp, 1997). In 1983-'84, more than 37% of the bachelors degrees in computer science were awarded to women. Ten years later, the percentage had fallen to 28%, and it has held relatively steady through the new millennium (Camp, 2002).

An examination of research on women in computer science revealed that emphasis at the post-secondary level is on the social psychological factors that prevent women’s inclusion (Dryburgh, 2000). Margolis and Fisher (2002) used the metaphor of a “clubhouse” to describe the extent to which women are excluded from the male purview of computing, and “dreaming in code” as “emblematic of a male standard of behavior in this computer-oriented world.” The authors no longer want to try to fit women into this male culture. They issued a call to arms for a revolution in the culture and curriculum of computer science that will encompass and respect the contributions women can make to the discipline.

As young women grow older, fewer of them express interest in studying STEM subjects. The literature refers to a “leaky” pipeline of women from elementary school through graduate studies and employment, eventually leading to their under-representation in the STEM professions. (Freeman, 2004; Jones, Howe, & Rua, 2000.)

A 2003 US National Science Foundation publication described 211 ongoing projects in the country designed to attract and retain women in STEM courses. More than $90 million had already been poured into these projects. Given the proliferation of such efforts, some measurable effect on the entry and persistence of women in these professions should be expected. However, studies indicate no substantial gains (Freeman, 2004; Huang, Tadolese & Walter, 2000). In fact, much of the progress that women have made in these areas has stalled or eroded (National Council for Research on Women, 2001). Such findings indicate the importance of developing additional new strategies for
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