# Chapter 3
# GETSMART:
## An Academic–Industry Partnership to Encourage Female Participation in Science, Technology, Engineering and Math Careers

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## ABSTRACT

*This chapter reports on the development a formal social mechanism for interaction among female IT role models, such as industry executives and recent college graduates, higher education IT academicians, and female middle school and high school students. The GETSMART (Getting Everyone To Study Math and Related Technologies) program is designed to address the national issue of low female participation in the computer science and information systems fields. The goal of this initiative is to create an innovative educational and mentoring program that encourages women to pursue studies and careers in science, technology, engineering and math (STEM). The comments of the GETSMART participants serve as a feedback loop to the program executive and academic leaders and indicate the importance of teachers, parents, role models and early STEM experiences in formation of interest in STEM.*

## INTRODUCTION

Between 1950 and 2005, women's workforce participation in the United States has grown tremendously from 33.9 to 59.3 percent (Bureau of Labor Statistics 2007a). The role women play in the workforce has improved as well with women in the US holding 51 percent of all professional positions (NCWIT, 2007). However, women remain underrepresented in science, technology, engineering and math careers such as architecture and engineering (14.4 percent) and computer and mathematical jobs (25.6 percent) (Bureau of Labor Statistics 2007b).

At the same time, there is a worldwide shortage of engineering and Information Technology (IT)

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workers and strong demand for STEM specialists. In the United States employment of computer scientists, engineers and mathematicians is expected to increase by 37, 11 and 10 percent respectively between 2006 and 2016 (Bureau of Labor Statistics). Increasing the female workforce is one possible solution to overcoming the worldwide shortage of engineering and IT personnel. Such a solution, however, is unlikely unless college enrollments of women in these fields can be increased. While nearly 60 percent of all undergraduate degree recipients in US colleges and universities in 2006 were female, only 21 percent of undergraduate degrees in computing and information sciences were awarded to women (NCWIT 2007). A miniscule 1 percent of all females taking the SAT reasoning test, a major college entrance exam in the USA, in 2006 indicated that they were interested in pursuing IT related degrees in college (NCWIT, 2007).

So what can be done to encourage women to pursue science and technology degrees and careers? In this chapter we describe an academic-industry partnership that aims to educate and excite middle and high school female students about math, science and technology. The purpose of the chapter is two-fold. First, we report on the development a formal social mechanism for communication among female IT role models (industry executives and recent college graduates), higher education IT academicians, and female middle school and high school students. The GETSMART (Getting Everyone To Study Math and Related Technologies) program is a model for influencing socio-cultural factors affecting female IT career choice (role models and mentors), the need for which has been suggested by Ahuja (2002), Adya & Kaiser (2005) and Trauth et al. (2008). Second, we report the attitudes of GETSMART program participants towards a career in STEM. The girls' comments indicate the importance of teachers, parents, role models and early STEM experiences in formation of interest in STEM, and serve as a feedback loop to the program executive and academic leaders.

The next section of the chapter discusses women's attitudes and perceptions about STEM careers. It is followed by a section that identifies gender differences that are salient in choosing a technical career with a special emphasis on role models and mentors. Finally, a section on academic-industry partnerships that provide a great opportunity for community outreach is included. Because role models are especially important for female career orientation, the GETSMART program is presented as an example of an academic-industry partnership that brings academic and industry mentors together to promote careers in math, science and technology among girls. Our experiences with GETSMART and recommendations for other programs are discussed in the final section.

## WOMEN IN SCIENCE AND TECHNOLOGY

Researchers and practitioners alike have long wondered why women are significantly underrepresented in STEM fields. Various reasons have been proposed that can be grouped into three main categories: differences in aptitude, discrimination, and personal choice (Rosenbloom, Ash, Dupont, & Coder, 2008). In the field of computing this has been a topic of concern for decades with a series of articles published in a special issue of the Communications of the ACM in 1995 (Snow, 1995; Klawe & Levenson, 1995) and a follow-up review article on progress to date in 2009 (Klawe, Whitney, & Simard, 2009).

Some may argue that women simply are not wired the same way as men and they tend to perform worse on math, science and technology tasks because they have lower abilities when it comes to those areas. Women indeed report lower levels of computer self-efficacy (Johnson, Stone, & Phillips, 2008). Computer self-efficacy is the individuals' belief of their ability to perform across