

Introducing Young Females to Information Technology

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INTRODUCTION

The difficulties in recruiting females into information technology and computer science (CS) have been well documented. Engineering disciplines have faced the same problem for many years. Some of the main underlying issues include unsupportive classroom environments (Hall & Sandler, 1982), gender-related perceptions of performance, a lack of role models, and inadequate peer communities (Zappert & Stansbury, 1984). Other contributing factors are the amount of positive computing experience gained prior to enrollment at the university level (Robers, Kassianidou, & Irani, 2002) and self-confidence. Research provides significant evidence to indicate that, even though females perform at the same levels as their male counterparts, they have less confidence in their abilities (Arnold, 1993; Fisher, Margolis, & Miller, 1997; Sax, 1994; Strenta, Elliot, Matier, Scott, & Adair, 1994). This lack of confidence keeps many females out of the technical classes. Finally, those females that do enter IT or CS courses may come to the discipline with multiple interests and, consequently, feel out of place at times among their more single-minded male counterparts (Widnell, 1988).

While it is predicted that 8 of the 10 fastest growing occupations from 2000 to 2010 will be in the IT or CS fields, it is expected that women will not be equally represented within these occupations (<http://www.bls.gov/oco/ocos267.htm>; Camp, 1997). The underrepresentation of women in computer science was given priority in the June 2002 special issue of *SIGCSE Bulletin* dedicated to women and computing, bringing focus to previous and current research regarding this dilemma. One particular factor highlighted in this bulletin is that changing this male-

dominant field requires the crucial step of targeting young females in an effort to dispel stereotypical ideations and gender bias associated with computer science, thus attracting more women to the profession (American Association of University Women Educational Foundation, 1999).

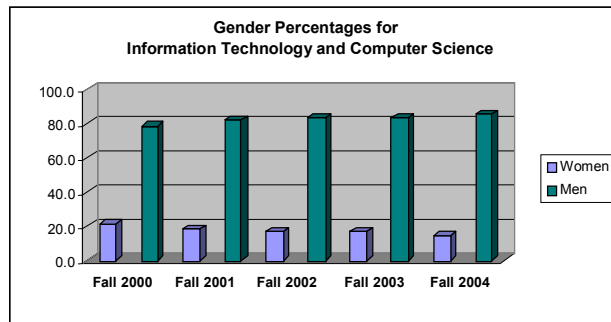
Girls in Science and Technology (GIST) is a free science and technology camp at East Tennessee State University (ETSU) making efforts to change these trends. The primary goal of the girls-only GIST camp is to introduce females to the fields of information technology, computer science, and math by providing discipline-related activities, enhancing teamwork competency, connecting females with women mentors working in the field, and creating a challenging yet fun atmosphere free from male competition. The hope is that this exposure will instill technical confidence and aptitude in the young females that will last through their college careers, giving them a positive outlook on information technology.

BACKGROUND

The enrollment statistics at ETSU for undergraduate degree-seeking students indicate that women are underrepresented within the IT and CS majors. In fact, these statistics show that women lost ground over the last 5 years. Note the downward trend in the percentages of females enrolled in IT- or CS-related majors at ETSU shown in Figure 1.

An analysis of data from the Office of Institutional Effectiveness and Planning at ETSU shows female enrollment at 21.4% vs. male enrollment at 78.6% in the fall of 2000. However, in 2004, female enrollment dropped by 6.3% compared to an in-

Figure 1.



crease of 6.7% in male enrollment (Baxley, 2004). The underrepresentation of women in IT and CS at ETSU parallels nationwide research suggesting that women are not equally represented in computer-related fields (Camp, 1997). It is our goal to provide exposure and opportunities to females, especially rural, underprivileged females in East Tennessee, and help reverse this trend.

The GIST camp offers a different perspective in introducing young females to IT. Previous research targeting females, primarily between the ages of 12 and 16, has shown the effectiveness of science and technology camps in providing a climate free of male competition and gender bias (Countryman, Feldman, Kekelis, & Spertus, 2004). Additionally, other research notes the importance of implementing science and technology programs within elementary schools so young females will not lose interest or feel less competent in IT and other predominately male areas when reaching middle and high school (Entwistle, 2002). Based upon research and prior experience, leaders of the GIST camp are now targeting females between the ages of 10 and 13 by providing a free science and information-technology camp for middle-school females.

MAIN THRUST OF THE ARTICLE

GIST Camp Activities

Participants in the GIST camp are divided according to age to accommodate the developmental stages of the different age groups. Each 5-day camp session is held Monday through Friday. Camp activities for each week are structured in similar fashion. Each day consists of computer lab time, team-building

exercises, and a science experiment or science tour, with female professional speakers visiting several times per week. The order of activities varies slightly during the week to accommodate the schedules of speakers and departments hosting science tours. However, there is a deliberate alternation between time spent in front of the computer and time spent physically active. Figure 2 contains a schedule from a sample day in the camp. The camp activities lead to our desired outcome of participants gaining exposure to science and information technology in an atmosphere encouraging uninhibited exploration and experimentation related to these fields.

Evolution of the Camp

A pilot summer-camp program was initiated by two faculty members from the Department of Computer and Information Sciences at ETSU in 2000. The camp consisted of two week-long sessions and included a broad age range of females, from 9 to 16 years. Beginning in June of 2002, the camp was started on an annual basis, targeting females ages 10 to 15.

After the pilot camp was completed, the researchers formulated two important questions: (a) What is the appropriate age range for this kind of program, and (b) what are the appropriate kinds of activities for the selected age ranges? After holding the camp for 4 years, the researchers feel they have a working answer for both of these questions.

The researchers decided to approach the question of an ideal age range for a summer IT camp in multiple stages. The first stage would be to target the age group of 12 to 13 years. If this proved to be successful, the program would then be expanded incrementally to include younger and older females. As long as each new session was successful, then new groups would be added to expand the range of girls included in the program.

Figure 2.

Lab Time	9:00 a.m. – 9:50 a.m.
Team-Building Exercise	10:00 a.m. – 10:50 a.m.
Lab Time	11:00 a.m. – Noon
Lunch	Noon – 12:30 p.m.
Speaker	12:30 p.m. – 1:15 p.m.
Science Tour	1:30 p.m. – 2:15 p.m.

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