High school girls’ perspectives of and attitude towards computer science courses: An exploratory study

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Introduction
The low enrollment of female students in high school science and technology courses is a phenomenon that draws attention of school teachers and researchers. Inspired by a local high school computer studies teacher, who observed that there was a very low enrollment of female students in computer studies courses, this study was designed to find out the factors that affect female students’ decision in their choice of courses. The goal of this exploratory study was to understand such factors by listening to the perspectives and attitudes of secondary school girls’ at the target school regarding enrolling in science and technology courses in general, and taking computer studies courses in particular.

Literature review
In the past few decades, females “have made great progress in increasing their performance and participation in science and technology studies” (Thom, 2001, p. 6), but there seems to be a persistent issue that women are severely underrepresented in high school and college computer science programs (Butler, 2000; Jobe, 2003; Olivieri, 2005; Rodger & Walker, 1996). Studies have been conducted on this topic and have identified possible causes of this phenomenon, such as lack of female role models, a predominantly male environment, lack of encouragement from parents and others (Butler, 2000; Olivieri, 2005), the attitudes of the secondary school girls (Thom, 2001), school characteristics (Xue & Burnett, 1999), or family background (van Langen, Rekers-Mombarg & Dekkers, 2006). To address this equity issue, researchers have made different suggestions, including programs specifically designed for females (Rodger & Walker, 1996), using female role models (Evans, Whigham, & Wang, 1995), pairing girls with mentors (Reis & Graham, 2005), etc.

Research methods
Research participants: Female students from grades 9 and 10 at a local secondary school (N = 218) were invited to voluntarily complete the survey and 147 completed copies of questionnaire (67.4%) were returned. Eighteen (n = 16) participated in focus groups discussions.
Survey: A questionnaire was designed to collect the baseline data on the participants’ demographic information, the courses they had registered, their future career plans, and their perspectives of and attitudes towards computer studies courses. The survey contained multiple choice questions, rating scale checklists, and open-ended questions. Focus group discussions: Based on the questionnaire responses, semi-structured interview questions were designed for the 4 focus group meetings in April, with 4 - 6 participants each. The discussion questions were tailored to further determine the participants’ perspectives of and attitudes toward high school computer studies classes. The discussions were carried out on campus of the school. For confidential purposes, the
school teachers were not present at the site of focus group discussions. The focus group discussions were recorded with a digital voice recorder.

**Data analysis:** The survey data were coded and entered into SPSS software for analysis. Recordings of focus group discussions were transcribed with assistance of the software package Transana 2.3. Analysis of the quantitative data was focused on participants’ demographic background including age, family background, previous educational experiences, socio-economic status, etc. This analysis was aimed to obtain some emerged themes that would help modify questions for focus group discussions.

**Preliminary findings**

This is an exploratory study that was designed to obtain participants’ perspectives of and attitudes toward computer studies courses at their secondary school. Because of the diverse demographic backgrounds and social conditions of the participants, such as age, family background, previous educational background, and social and economic status, there was a big variety of responses to the semi-structured focus group discussion questions. Major factors influencing the low enrollment of female students in the courses were identified as follows:

- Learning environment: the course content, equipment (computer hardware, software and network), and teaching methods were perceived as not up-to-date so students found the course “boring” or “not interesting”;
- Perceived benefits: participants had a variety of future career plans but most of them thought that since they were not going to work in the field of IT they did not need to know much about computer studies;
- Family influence: depending on the profession and educational background of their parents and other family members, some participants had a broader and more in-depth understanding of computer studies courses then others.

**Discussion**

Due to the lack of professional development of teachers and the advancement of ICT infrastructure in the school, the learning environment was not perceived to be motivating and participants thought they could not enjoy the course. This tells us that schools need to improve their ICT infrastructure and computer studies teachers need to update (and upgrade) their teaching methods to meet the needs of students who belong to the Net Generation. Students did not have a good understanding of the fact that ICT have become part of our daily lives, so they did not realize the importance of ICT literacy, and they did not think they could learning something very useful from this course for their future career. Many of the participants developed their understanding of the importance of ICT literacy based on what they learned from their families, which means for those whose families could not avail the source of knowledge would be put in a marginalized position in this regard. Therefore, schools have the responsibility to take measures to promote the importance of ICT literacy through workshops and other relevant activities. One of the assumptions we made before the data collection was that peer pressure or influence played an important role in the participants’ choice of courses, but very few of them reported that as a factor, which was different from findings of previous literature.
References