

International Perspective of Women and Computer Science

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1. Summary

The topic of women in computer science has recently been getting more and more attention. The special issue of the SIGCSE Bulletin *inroad* (Volume 34, Number 2, published in June 2002) is one of the milestones that indicate this trend. However, a review of this special issue reveals that though the topic is examined from different angles, only one paper addresses it from an international point of view. By presenting statements derived from four countries on four different continents, our panel aims to highlight the topic from this multi-national perspective. Throughout the discussion with the audience we hope to identify common interests and to check whether an international agenda with respect to the topic can be formulated.

2. Panelist Position Statements

Elizabeth S. Adams, USA

For a long time, I have been concerned that although the women computer science majors I encountered were among the best students in my classes there were not enough of them. In discussions with colleagues at my institution, this was a common situation in almost all the science majors with the exception of biology. Two courses we created at James Madison University to attempt to understand why and to raise the consciousness of women on our campus are described in [3].

In recent years we have had more students wanting to major in computer science than we could comfortably handle. This semester, along with a number of other American institutions, we have seen a significant drop in the number of freshmen who indicate a desire to major in computer science. We are very concerned that this will further decrease the proportion of women CS majors. Recent research by J. McGrath Cohoon [2] examined the possible causes of female attrition in Virginia's 23 coeducational CS departments. She found that female students were retained in the major in the same proportion when a number of conditions held, among them women faculty, a stable department, a strong local market for graduates, sufficiently large number of female students in each class for them to support each other. Some of these factors are beyond our control. Others deserve our attention.

Orit Hazzen, Israel

In the 1990s, Israel emerged as a leading center for technology start-ups and innovation. In the hi-tech pick, with its about 3000 startups, and the highest number of engineers per capita in the world, the hi-tech sector comprised 15% of Israel's overall economy and Israel had the third (after the U.S. and Canada) highest number of companies listed in Nasdaq. Currently, as a result of the worldwide crisis and the political situation in the Middle East, foreign investment in Israel decreased. However, quantitative data indicates that even in the hi-tech pick days women's role in this niche was under representative. As a result we started a research its main aim is to explore why high-school girls and women in the universities and in the industry do not choose being computer scientists. The research is supported by two Technion funds (the Samuel Neaman Institute Fund and the Fund for the Promotion of Research at the Technion).

At the moment our research focuses on the high-school population. Formal and informal data indicate that the percentages of the high-school girls who study computer science at the highest level of the matriculation exam remain relatively low. For example, in the years 1998, 1999 and 2000 the percentages of girls who took the highest level of the computer science matriculation exam was 26%, 27% and 29% respectively. Our activities aim to increase the number of girls who choose to learn in the highest level of the matriculation

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exam in computer science. One of the leading activities of the research is the recruitment of teachers to join the research by inviting them to be involved in data collection and its analysis. In my presentation some findings and additional activities will be described in detail.

Hrafn Loftsson, Iceland

Reykjavik University was established in 1998. The first 4 years the university had two schools, a Business school and School of Computer Science. In fall 2002, a Law school will start its first year. In both year 2000 and year 2001 the percentage of female applicants to the School of Computer Science was about 31%. This ratio is, in my opinion, quite acceptable, if one bears in mind that in many other Computer Science schools the ratio is quite lower. It is, however, quite interesting that during the same years the percentage of female applicants to the Business school was about 59%. For fall 2002, the total number of applications to the School of Computer Science dropped 45%, compared to fall 2001. Other Computer Science schools are experiencing a huge drop in total number of applications compared to the last couple of years. This is in most cases explained by the current problems of the computer industry.

What is interesting at Reykjavik University is the fact that the economic downswing seems to have much greater affect on the women applicants because the percentage of female applicants to the School of Computer Science for fall 2002 is now only about 15%. In comparison, the percentage of female applicants in fall 2002 at the Business school and at the Law school at Reykjavik University is 54% and 55%, respectively.

At least two questions arises from this compilation:

1. Why does the ratio of female applicants drop from about 31% to 15% when the computer industry is experiencing problems?
2. Both the Business school and the Law school have more female applicants than male applicants. Obtaining a 50% ratio of female applicants to a Computer Science program is a difficult task but what needs to be done to obtain a 30% ratio again?

Alison Young, New Zealand

Much has been written in the past decade on the number of women entering computer science programs and also the number of women staying in the profession. However the "Incredible Shrinking Pipeline", [1] is still shrinking. Various strategies have been offered to address the imbalance [5] yet we can only assume the strategies have not been implemented or are not working. At UNITEC Institute of Technology in Auckland,

New Zealand the Bachelor of Computing Systems, a degree that encompasses the overlapping areas of computer science, software engineering and information systems, was first introduced in 1997. At the introduction of the undergraduate degree program 30% of the first cohort were female, this contrasts with the current enrolment of just under 20% in 2002. Also an important point to note here is that the number of indigenous (Māori) women who represent 14.5% of the total New Zealand population, are less than 1% of the enrolments [4]. These numbers are in contrast to the Bachelor of Business which has majors in accounting, management and finance and are consistently at 60% female enrolments. The situation at postgraduate level in computing and information technology is currently slightly better but hardly acceptable, with 32% of the students being female, and as there are fewer female students coming through this level is also bound to decline.

"Successful competition in international markets in a highly technological world requires the development of the maximum potential of each individual member of society, irrespective of whether the individual is male or female." [5]. It is critical again now that the national and international research projects identify the underlying issues that continue to turn our young women away from careers in computer science and that we also not only identify strategies to educate their career decisions but also implement and monitor those strategies to address the imbalance.

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