# The Social Construction of Australian Women in IT



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## INTRODUCTION

The declining participation of women in IT education and professional work is now a well-documented research area (Adam, Howcroft, & Richardson, 2004), but the causes and remedies remain puzzling and complex. Studies have indicated that there are signs of the "shrinking pipeline" (Camp, 1997) even in the years between junior and senior high school (i.e., Meredyth, Russell, Blackwood, & Thomas, 1999) when girls' interest and confidence in the use of computers declines markedly.

A lack of clarity as to what constitutes the IT industry and the rapid rate of change complicate attempts to understand the reasons for the declining participation of women in the IT industry, as well as the declining interest in IT degrees. This is despite the fact that IT salaries compare well with other professional salaries and are superior to most traditional female occupations (Megalogenis, 2003). Our research also demonstrates that many people—especially women—enter the IT workforce via other qualifications indicating that traditional IT education is not very successful in attracting either the quantity or quality of students required to meet workforce needs. Furthermore, IT has not matched the rise in female participation in the traditionally male-dominated professions of science, engineering, and medicine.

## AUSTRALIAN SITUATION

By the start of the last decade, the proportion of females in the IT workforce was beginning to decline in most western countries including Australia (von Hellens, Pringle, Nielsen, & Greenhill, 2000).

About 20% of the members of the Australian Computing Society are women. The Australian Bureau of Statistics show that the percentage of women working in IT occupations decreased in 1996-2001 despite the total number of people (men and women) with IT qualifications increasing significantly, to around 70% (Byrne & Staehr, 2003). IT education suffered one of the highest drop-offs in students' numbers between 2003 and 2004 and the IT schools' downturn has continued in 2005 (O'Keefe, 2005). Figures from the Australian Department of Education, Science, and Training reveal a 6.7% drop in IT, from the 68,271 students (domestic and overseas) in 2003 to 63,651 in 2004. The decline was even higher with women: a 14.7% decrease. The percentage of female students in IT declined from 24.02% to 21.97%. The information systems area of IT in the business schools has traditionally had more female students than the core IT programs. However, the downturn of students and female students in particular is apparent there too (Business/Higher Education Round Table, 2004).

## WOMEN IN INFORMATION TECHNOLOGY PROJECT

To deal with this complexity, the Women in Information Technology (WinIT) research project has taken several perspectives, reflecting the multidimensional nature of the problem (von Hellens & Nielsen 2001; Trauth, Nielsen, & von Hellens, 2003). The project has surveyed and interviewed male and female high school students as well as undergraduate and postgraduate IT students. Interviews have also been carried out with high school teachers, vocational guidance counselors, IT academics, and profession-

als in the IT industry. A complete list of published research can be found at http://www.cit.gu.edu.au/~jenine/WinITProject/. This article provides an overview of the WinIT research and the findings to date.

The perspective taken in the WinIT research is based on widespread views of gender in IT:

- **"Sameness":** That women are capable of entering and succeeding in male domains by adapting to those domains.
- **Social Construction:** That in order to understand IT as a field of education and work, it is worthwhile to view it in terms of its social and political construction, in the same way that "female" domains such as child care and nursing may also be viewed.

Although the WinIT focus has been on female's perception, male students have also been interviewed and surveyed to further clarify the female experience. We have also focused on Confucian Heritage (CH) students from a range of South-East Asian countries who represent a major non-English speaking background ethnic group among IT students in the Australian education system including high school and universities, especially their female contingent.

## HIGH SCHOOL STUDENTS

Male and female high school students in the IT entry-level mathematics course were surveyed and interviewed (Nielsen, von Hellens, Pringle, & Greenhill, 1999). Both Asian and non-Asian females had similar views about the work of an IT professional, who they characterized as a person working alone with a computer and thus not requiring any communication or people skills. Females perceived computing as boring, requiring logic or mathematics skills, and involving little contact with other people. There was a strong impression that women preferred different types of work that would require personal contact and communication. Female students expected boys to be more interested in computers than girls, as computing was perceived to be a masculine pastime. There was a false perception among female students that the participation of women in IT was improving rather than declining.

The use of computers outside school was equal between Asian and non-Asian girls, but Asian females were more inclined to choose computing and IT subjects at school, despite the presence of negative perceptions. It appeared that the usefulness of computing and the favorable prospects for employment, rather than personal interest, were stronger motivating factors for Asian students than for other female students.

## FIRST YEAR UNIVERSITY STUDENTS

Research revealed that the IT degree was much harder than expected, and female students were either ignored or harassed (Nielsen et al., 1999). Males dominated the study environment physically. Although not all female students perceived this as a problem, some expressed resentment at other female students' reliance on male students and also of bad behaviour by male students in computer labs. Condescending behavior towards female students took the form of stereotyping based on intellectual achievement and physical appearance. Inclusion in the "pretty and smart female" group meant a privileged acceptance into the male-dominated setting.

There was a notable difference in the way Asian and non-Asian female students experienced gender-based discrimination. The former felt their opinions were not valued as highly as those of non-Asian students and all non-Asian people largely ignored them. As a result, they felt isolated and ignored and had to band together for guidance and assistance. On the other hand, non-Asian female students felt they were the focus for sexual harassment (e.g., via remarks and uninvited e-mails). They received unwanted positive discrimination in the form of easier marks, which was offensive to their sense of achievement. There were subtle differences in staff behavior towards female students, particularly if they were Asian. Interviewees claimed that lecturers preferred male students. Competition between students did not worry female students. Their social interactions were comfortable and they found it easy to initiate collaborations, however there was some confusion about the differences between working together, and plagiarism.