

# Australian IT Enrollment Trends and Model of Contributing Factors

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## INTRODUCTION

Australia, like other western nations, is experiencing a *downturn* in overall *enrollments in higher education information technology (IT) degree courses* as well as in the proportion of females selecting these courses. The percentage of women enrolled at a university in Australia, as a proportion of all enrolments, has increased steadily over the last decade from 52% of the total student body in 1993, to 54% in 2003 (DEST, 2004). This increasing number of females on campus is not reflected in *IT degree course enrollments*, where the number of female commencing students is steadily declining.

## BACKGROUND

In Australian universities, IT courses cover a range of specialties: information systems, computing, computer science, software engineering, computer graphics, and database management are some example titles. The many names associated with the discipline, its relatively new nature, and the continuing growth in its application into new fields may account for this range of university courses offered in the discipline. The broad classification provided by the associated government department that gathers statistics divides the discipline into thirteen areas, which have been grouped in to four main categories for the purpose of this article: computer science, information systems, information technology, and information technology not elsewhere classified<sup>1</sup>. Figure 1 clearly shows the declining popularity of all IT courses with young women.

The downturn in popularity of IT degree courses is also evident in statistics related to student selec-

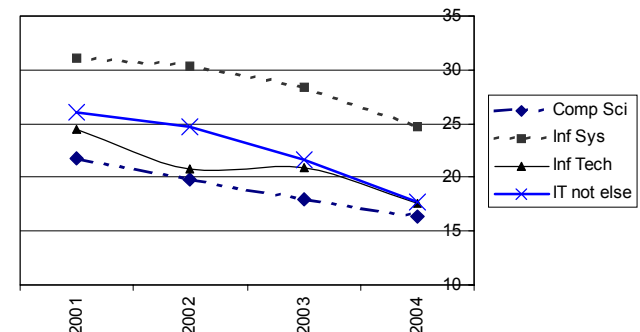
tion of university courses. Since 2001, there has been a decline of 46% in the number of students choosing IT as their first preference university course (VTAC, 2004). Divided by gender, there is an overall decline of IT course popularity of 65% in females and 40% in males (VTAC, 2004). This trend of declining popularity of IT degree courses is against the trend of young women embracing university education in general.

This apparent under representation of women in IT raises two questions. Why is the under representation an issue and why is there an under representation? An examination of the literature in this field and further discussion of these two questions is covered in the next section of this article.

## WHY FEMALE UNDER REPRESENTATION IS AN ISSUE

A primary concern of IT academics and IT professionals as a result of the under representation and apparent declining interest in IT courses amongst

Figure 1. Female commencing students as % of total commencing students (within IT streams)



women is that the pool of talent being attracted to this discipline is not diverse enough and there is a “latent IQ” being overlooked (Richardson, 2003). The discipline is poorer because the under-utilisation of women results in a lack of the female perspective being reflected in IT projects in general (Richardson, 2003). Arguably women are excluding themselves, or being subtly excluded by social norms, from the opportunity to influence and shape future applications of IT in business, health, industry and education through not being involved in its design and application to an equivalent extent as men. The international women and computing literature expressing this concern can be traced back over twenty years, and provides information of government, education and industry funded programs to attract females to the discipline since the 1980s (Craig, Fisher, Scollary, & Singh, 1998; Wardle & Burton, 2002).

## **WHY THERE IS FEMALE UNDER REPRESENTATION**

Efforts and intervention programs to attract women to IT appear to have had limited success and often negligible impact beyond the local area. Some programs implemented at secondary and tertiary levels in Australia and overseas have produced increases in enrolment numbers (Jewell & Maltby, 2002; Margolis & Fisher, 2002), but have not led to increases in the enrolment statistics in Australia in general. One particular study at a Victorian university found that a government funded Australia wide program initiated in 1990 to attract and retain women in IT fell well short of its aim of 40% female enrolments in higher education IT degree programs by 1995 (Byrne & Staehr, 2003). At the Australian Women in Computing conference in 1997, a collection of data from participating institutions showed that only two universities had met the government target of 40% female participation in only two of their degree programs (Byrne & Staehr, 2003).

The explanations given for this under representation will be discussed in the following sections. They have been logically grouped to provide a hierarchal overview of the extent of their influence. Overriding all is culture, which influences family, then education experiences, and last of all, the individual.

## **Culture**

An overview of the cross cultural aspects of gender and IT is provided by Galpin who uses the “internal self-selection” model to explain why the lack of females in science in the U.S. cannot be applied to countries like India for example, where the family and not the individual is the decision maker (Galpin, 2002). While there is no evident pattern across countries, the expected role for females in the society, who the main decision makers in the family are, religious beliefs and education opportunities of females vary between cultures and all influence the decision to pursue a science or IT career (Galpin, 2002). An earlier study found that Asian women are less discriminated against and encouraged more by parents to follow career paths in IT (Clark & Teague, 1994). Preliminary results of a study across three countries (Australia, Hong Kong, and England) found a common perception of the IT discipline (male, isolated) held by both genders. This perception, rather than perceived academic difficulty, was the main reason given by participants for not choosing an IT career path (Craig, Paradis, & Turner, 2002).

Nielson, von Hellens, Greenhill, and Pringle developed a useful diagram that summarised factors affecting student perception of IT careers (1998). They included the key factors of gender, life history and cultural values that were influenced strongly by cultures of collectivism and cooperation (an aspect of Eastern cultures) or individualism and competition (an aspect of Western cultures). They concluded that national culture appeared to strongly influence perceptions of IT, more strongly than gender factors (Nielson et al., 1998). The strength of influence however cannot be measured and with the evidence in enrolments of fewer western females studying IT than females from Eastern cultures, the influence of culture appears quite strong.

## **Family**

Family expectations are intertwined with culture and are a contributing influence to account for why women choose to study IT. The education level of parents influences whether girls decide on engineering, science or computing career path. This seems to be more applicable to females than males and the education level of the mother tends to be more

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