

# Attitudes Towards ICT in Australian High Schools

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## INTRODUCTION

Information and communication technology (ICT) is integrated into almost every daily activity. Yet, few females today are choosing ICT based careers; a large percentage prefer to work in “pink collar” jobs such as childcare, education, and nursing. A recent report (Queensland Government, 2004) states that the average weekly earnings of full-time female workers in ICT, personal services, education, and health careers are \$883.30, \$513.10, \$802, and \$854.20 respectively. Furthermore, even though females consistently earn less than males, female ICT workers record the highest average earnings for all female occupations. Not only are females rejecting the financial rewards associated with ICT careers in favor of jobs that are seen to have a high human concern, they are also denying their voice in the creation and development of future technologies and applications. However, why are they shunning ICT study and careers? How does their educational environment and their perceptions of ICT impact ICT study and career choices? This article explores these questions through the 2003 case study of Year 9 and 12 students, teachers and guidance officers at two co-educational schools in Queensland, Australia. Data was collected from 490 participants through questionnaires and six students and four teachers took part in interviews. Two theoretical frameworks, organizational culture and information quality, were used as a lens to view the situation.

## BACKGROUND

The longstanding debate over whether females are not engaging in ICT careers because they are biologically not suited to technical work (essentialism), or that they have been nurtured to believe that they are not suited to technical work (social construc-

tion), continues to be contested. However, new theories, including Trauth’s (2002) theory of individual differences, are emerging to address the flaws and gaps within these theories. The underrepresentation of females in ICT is also not a global phenomenon; there are cultural pockets in the world, including Mauritius, where females represent a relatively equal proportion of the ICT vocational and educational cohort (Adams, Bauer, & Baichoo, 2003). However, it is a well-documented problem in Western cultures, including Australia.

Research shows that females are methodically guided away from technical fields during school through classroom culture, traditional gender roles and other societal pressures (Gorski, 2002). Some of the enduring ICT stereotypes are that ICT professionals are Caucasian males with antisocial tendencies (Countryman, Feldman, Kekelis, & Spertus, 2002; Güner & Camp, 2002) and that ICT is boring and “geeky” and involves working long hours in social isolation, (Joshi & Kuhn, 2001; Myers & Beise, 2001; Newmarch, Taylor-Steele, & Cumpston, 2000). Popular media has enabled mass reinforcement of these established and often undesirable ICT stereotypes and there is a distinct lack of both fictional and real ICT role models who are given media coverage (Multimedia Victoria, 2001). Job security is also important to senior school students (Multimedia Victoria, 2004). Today’s youth witnessed the “dot-com” boom and skills shortage followed by mass redundancies and unemployment in ICT during the bust. This episode was highly publicized by the mass media, but the recovering ICT job market has not been given the same level of publicity. According to the Oliver Group director, the technology sector grew almost 56% in the twelve months from March 2004 (Foresheaw, 2005). Anecdotally, many students and their parents believe that the ICT job market is still depressed and express surprise when informed about the recovering market.

Many students lack information about ICT work and exhibit little understanding of the nature of ICT jobs (von Hellens, Nielsen, & Beekhuyzen, 2004). They do not know about established ICT occupational roles, such as being a computer scientist, let alone the new opportunities that are being created and thus do not know how their talents and skills apply in that field (Jepson & Peri, 2002). However, describing the ICT area, including job roles and areas is a non trivial exercise, even for experts in the area (Spencer, 2003). Australian students are also receiving limited information about ICT subjects and choices available to them (Van Der Vyver, Crabb, & Lane, 2004). Students have been exposed to ICT integrated into the general school curriculum, but few have a clear idea of what is involved in ICT subjects (Sheard, Lowe, & Markham, 2001). Compounding the issue within vocational education, career advisors often admit to struggling to understand ICT jargon and job descriptions (Standley & Stroombergen, 2001) leading to the lack of confidence in giving ICT career advice (Multimedia Victoria, 2001).

The way that the ICT curriculum is introduced and the learning environment impacts on the ICT attitudes of students is of high concern. It is imperative that the curriculum provides future ICT students with coursework which interests both sexes whilst providing them with the appropriate skills to enter ICT career paths (Gürer & Camp, 2002). Yet, many students report negative opinions of ICT specific subjects and general dissatisfaction with the ICT curriculum (Carey, 2001; Multimedia Victoria, 2001). These opinions could be partially because the predominant content of ICT subjects in schools involve word processing and spreadsheets (Downes, 2004) providing the students with a skewed perception of the true nature of ICT careers (Multimedia Victoria, 2001). ICT educators must not only focus on good teaching, but they must also evaluate whether the subject is seen to be challenging, useful and interesting (Mitchell, Sheard, & Markham, 2000). The ICT learning environment has a number of unique features including a predominantly male teaching cohort, who usually have a science or mathematical background, and a curriculum and associated assessment and exercises driven largely by masculine interests (Logan, 2004). Also, according to Carey (2001), teachers presently receive little or no train-

ing in the ways that technology can be used to create an equitable, innovative and engaging learning environment.

## **IMPACTS ON ICT PERCEPTIONS**

### **Organizational Culture**

Culture is the product of a social environment and evolves through the course of social interaction (Hofstede, 1997, p. 5; Morgan, 1998, p. 130). Cultural influences can shape perceptions about ICT, how ICT is used, and in turn the potential entrants to vocational and occupational areas in ICT and related fields (Harris & Wilkinson, 2004). Allaire and Firsirotu (1984) created a conceptual framework to assist in the analysis of organizational culture that consists of three inter-related components: a cultural system; a socio-structural system; and the individual actors.

The cultural system is a system of shared and meaningful symbols, which is shaped by its surrounding society and organizational history (Allaire & Firsirotu, 1984). There were a number of symbolic artifacts specific to ICTs that were observed amongst the responses from teachers and students, including terminology such as “hacker,” “geek,” “nerd,” and “square” when talking about ICT workers. The students linked ICT success with these symbolic artifacts when 24% of Year 9 students and 41% of Year 12 students stated that it was necessary to be nerdy/geeky to be successful in ICT careers. However, these symbolic artifacts are commonly used in a negative social context and tend to deter students from engaging in activities that would have them labeled as such. Other common beliefs repeated in teacher comments were that computers are seen as toys for boys and tools for girls. Female teachers also identified with these beliefs and one commented: “[computers are] strictly a tool to be used, not to be aspired to.” If computers are continually portrayed as something serious, rather than enjoyable, this may explain the reluctance of students to become involved in ICT. Students and teachers often regarded ICT subjects as being difficult with some students rejecting ICT subjects out of concern for their academic results and university entrance scores.

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