

Gender and IT – Preliminary findings from the GaIT Project

The *Gender and IT* (GaIT)¹ project is coming to the end of its third and final year. Researchers from Deakin University (Julianne Lynch, Catherine Harris & Leonie Rowan), the University of Western Sydney (Margaret Vickers, Susanne Gannon, Carol Reid & Kerry Robinson) and Charles Sturt University (Toni Downes) have worked together with the Australian National Schools Network, the NSW Premier's Department, the NSW Department of Education and Training, and the South Australian Department of Education and Children's Services, to develop a research project that would investigate the persistent gender gap in enrolments in senior secondary computing and information technology (CIT) subjects².

This report provides a brief overview of the project – the problem it responds to and the research methods used – and a summary of the preliminary findings. Final reports will be available in June 2008.

What is the gender and IT problem?

The low level of participation of girls and women in CIT education, training and careers is an enduring problem. Despite the considerable improvements made over the past three decades in terms of gender equity in other areas of education, female enrolments in CIT subjects and courses continue to be low in schools and universities. A GaIT-commissioned review of female participation in post-compulsory CIT subjects in NSW, South Australia and Victoria found that female participation in year 11 and 12 information technology and software development subjects have been in decline since 2002. In particular, software development subjects are extremely unpopular with girls, with females contributing to only 8% of total enrolments in 2006 in both NSW and Victoria (Kleydish & Downes 2007)³. Subjects focusing on information processing fare a little better, with females contributing to just under 30% of enrolments in 2006 in both NSW and Victoria, and to 18% of enrolments in South Australia in that year (Kleydish & Downes 2007). At the university level women make up less than 30% of undergraduate CIT enrolments (James, Baldwin, Coutes, Krawse & McInnis 2004). It seems that both boys and girls are losing interest in pursuing CIT studies, but that female enrolments are dropping at a faster rate and from a very low starting point. This is seen as an equity issue and also as a problem for the IT industry, which anticipates worsening current shortages in specialist skill areas if more school students (both boys and girls) cannot be recruited into CIT education pathways and careers (Department of Communications, Information Technology, and the Arts 2006; Multimedia Victoria 2004).

¹ This research project was funded as a Linkage Project by the ARC in the 2005 round of competitive grants. Its full title is *From High School to Higher Education: Gendered pathways in information, communication and computer technology education*.

² This report was written by Julianne Lynch. The views expressed may not reflect the views of the Industry Partners.

³ The content of IT subjects offered in NSW and Victoria is closely aligned. The South Australian curriculum does not include an equivalent subject to those software development subjects offered in these states.

Much of the existing research in this area has focused on reducing female attrition at the university level. The GaIT project builds on research at the school level that has begun to document complex gender differences in the nature and level of computer use by boys and girls, as well as the relations between computing as a field of practice and the gendering of identities within this field. The GaIT project sought to identify how the CIT curriculum is socially constructed as an area of study and how this influences the decisions boys and girls make to pursue, or to avoid, CIT education pathways.

Data collection

The data collection commenced in late 2005 and was completed by early 2007.

The selection of participants for the study was driven by the selection of schools. In the recruitment of schools to the project, we sought to vary the level of female CIT enrolment, the socioeconomic profile of the schools, and the location (urban, rural and metropolitan) of the schools. In total, 26 schools participated in the study (12 from NSW, 7 from SA and 7 from Victoria).

The study confined its school-based data collection to teachers involved in the delivery of CIT subjects and students undertaking the latter part of their secondary schooling: those in Year 10 in 2005 about to embark on their post-compulsory secondary school studies (who may or may not have elected to pursue future post-compulsory studies in CIT), and those in years 11 and 12 in 2006 and 2007 respectively who had had varying degrees of opportunity to reflect on their senior secondary subject choices. The data collection methods employed included semi-structured teacher interviews, a (largely quantitative) student survey (with 1430 responses), and semi-structured interviews with groups of students.

To complement this school-based data, we also commissioned a review of Year 11 and 12 CIT curriculum documents in each participating state, as well as a summary of female and male enrolment trends.

An important data source that was not included in this study was the direct observation of CIT classroom. We have relied upon the reports of students and teachers to provide insight into what goes on when current CIT curricula are implemented in classrooms.

Preliminary findings

Student misconceptions

Students were generally unaware of employment and career opportunities available in the CIT industries, with many students saying they believed there were not sufficient jobs available to warrant them making educational investments in this area, and others saying that, although many jobs required computing skills, they believed they had attained a sufficient level of skill during their compulsory years of schooling. The source of these beliefs was often reported to be parental advice. In some cases, such beliefs were shared by IT teachers.

Students generally held quite narrow beliefs about the content of senior CIT subjects, with many holding misconceptions about what senior secondary CIT studies would involve. It must be remembered that participants had very little (in many cases none) direct experience of Year 11 and 12 CIT subjects, with many electing not to pursue

these subjects, and others (at the time of interview) having only recently elected or started to study them. A common belief was that the Year 11 and Year 12 CIT subjects would have a similar focus to CIT subjects already experienced in the compulsory years, or to cross-curricular ICT initiatives, that is, having a focus on general ICT literacy skills and how to use popular software applications. Very few students seemed to have an appreciation of CIT as it might relate to the disciplinary studies of information technology and software engineering.

These misconceptions appear to have a more adverse affect on girls' interest in CIT subjects than on boys.

Failure to capture student interest

Many students reported that they found school CIT subjects (those they have had exposure to – in our study, compulsory years CIT) uninteresting and irrelevant. These perceptions tended to colour their expectations of senior CIT subjects. When classroom experiences were recounted that were seen as interesting or enjoyable, these were usually described as an exception amongst what was otherwise constructed as a fairly uninteresting subject area. Many students, when asked about their experiences of school-based CIT learning, described a combination of bookwork and individual work on a computer. Girls appeared to be particularly averse to classroom environments that were constructed by students as *theoretical* and lacking opportunities for social interaction.

Interestingly, popular leisure and lifestyle technologies such as iPods, mobile phones, and social applications of the Internet, were seen to be quite remote from the study of CIT at school.

Of particular note in relation to this study, those students who reported having high level computing skills were no more likely than others to pursue senior CIT studies, and most of this group of students also reported that they learn more about computers at home than at school.

Problematic positioning of the subject area

The purpose of those CIT subjects which lead to a year 12 qualification (eg., VCE subjects in Victoria) appears to be unclear to students and to some teachers. Senior CIT subjects do not seem to be constructed by teachers or students as a pathway to university studies in CIT, nor are they prerequisites for any Australian undergraduate courses. They are also seen as being less advantageous in terms of students' high school scores than other subjects. Many teachers and students saw VET subjects as a more strategic choice for those students with an interest in CIT, and this perception manifests in some of our participating schools in higher enrolments in VET CIT subjects than in the senior CIT subjects which lead to a year 12 qualification. The CIT subject area is often spoken about in vocational, rather than disciplinary, terms, and the VET options available to students in each state are consistent with this vocational viewpoint.

Even for those students with a stated interest in, and demonstrated aptitude for, computing, there seems to be very little provided in terms of rationales for electing to study these subjects. Career advice around this area was lacking in some schools, and, as a subject area that bids for a share of post-compulsory student enrolment, CIT does not appear to have a unified group of teachers, at the school or state levels, who

might promote the interests of the discipline. At all levels, specific studies in CIT compete with ICT initiatives for ‘air time’. In fact, CIT teachers’ time is often divided between these two competing agendas.

Persistent stereotypes and prejudice

Interest in CIT education is still associated with being a geek or nerd. The popular image of a student who has a high interest in computing is still one of a socially marginalised, emotionally immature male who has no investment in those social activities constructed as *normal* for adolescents. Similarly, this stereotype continues to paint a picture of studies and work in CIT as involving a solitary and intense connection with a computer for long periods of time. As such, CIT education is not constructed as appropriate for girls or for most boys. Students reported negative consequences of an overt interest in computers, such as social exclusion by peers and bullying. While girls seemed to fare less badly than boys in terms of these types of negative consequences, students participating in our study repeatedly said that girls were less suited to CIT subject than boys, or, conversely, that CIT subjects were less suited to girls than they were to boys. These types of explanations for the CIT-gender gap were often couched in an understanding of CIT studies as lacking opportunities for social interaction or for undertaking *creative* activities.

References

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