THE PROMISE OF DIVERSITY

GENDER EQUALITY IN THE ICT PROFESSION

DECEMBER 2015

FOREWORD

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There are two global trends which have significant implications for our economic growth prospects. Both shine the spotlight on the critical role women must play if Australia is to fully harness its human capital and achieve the standard of living to which we aspire.

Trend 1: The rapid advance of digital technologies, combined with the exponential growth in computing power, is redefining the world in which we live. On one hand, it is disrupting industries, organisations and careers, while on the other, it is creating an enormous array of new economic opportunities for businesses, start-ups and for people with suitable skills in the innovation space.

Trend 2: We are facing a potential crisis in human capital – an inadequate supply of the people and skills needed to sustain the growth levels that would be achievable through technology and computing power. The Boston Consulting Group (BCG) predicts that across the 25 major economies representing 80 per cent of world GDP, shortages of human capital and skills will result in lost GDP of $10 trillion between 2020 and 2030.[1] The European Commission estimates that by 2020 there will be 900,000 Information and Communication Technology (ICT) jobs in Europe that remain unfilled due to a lack of appropriately skilled workers.[2] In Australia, BCG estimates labour shortages will be around 3 per cent of labour supply in 2020 and up to 18 per cent by 2030. Much of the shortage will be in ICT. A recent report by Deloitte Access Economics for the ACS called "Australia's Digital Pulse"[3] estimated that demand for ICT workers in Australia will increase by 100,000 over the period to 2020. At present, indications suggest that we will simply not be able to meet that demand from domestic labour supply sources without making significant changes to key factors that influence ICT participation rates in Australia.

So how do we tackle the skills shortage problem and fully capture the benefits and opportunities of digital technologies? A critical component of the response must involve increasing the participation of women in the ICT workforce. The G20 Leaders in November 2014 committed to reducing the gap in participation rates by 25 per cent by 2025, bringing 100 million more women into the workforce and adding one trillion dollars to global GDP.[4] Grattan Institute analysis[5] suggests that if Australia was to lift its female labour participation rate by 6 per cent to be roughly comparable to Canada, our GDP would be $25 billion higher. In the critical ICT profession, female participation rates in Australia are substantially lower than the national average. The Deloitte report noted above finds that women are significantly underrepresented in the ICT profession, accounting for only 28 per cent of workers compared to the broader workforce where women comprise 43 per cent of all individuals in professional roles.

The key message is that, as a nation, we are significantly underutilising women in our workforce at a time when labour shortages, particularly in the ICT profession, loom as a major constraint on growth. What can be done to tackle this problem? This paper explores the life cycle experience of female participation in computer science and ICT to identify the key issues, when they emerge and how they might be addressed. The paper has been prepared by the ACS Women's Board for the ACS. I want to acknowledge and thank that Board for their outstanding work and their ongoing commitment to promoting the cause of women in the ICT profession. Our hope is that this paper encourages policy makers, employers, educational institutions and leaders in our community to take practical action to resolve gender imbalance, recognise the promise of diversity and unlock the productivity dividend that women can offer our economy. The ACS, the representative body for the Australian ICT profession, stands ready to take a leadership role on this critical issue.

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1 EXECUTIVE SUMMARY

A key challenge for all nations as they strive for increased productivity and a higher standard of living is to harness the full potential of their entire citizenry. In this context, one of the most recognised and acknowledged gaps is in relation to gender. Essentially, we need to encourage greater participation by females in our workforce. Analysis by Goldman Sachs[6] concludes that "closing the gap (between male and female employment rates) would boost the level of Australian GDP by 11%." As Annabel Crabb suggests in her book "The Wife Drought"[7], this would be like adding another mining sector to the Australian economy.

Yet despite the considerable gains on offer, we as a nation are a long way short of where we need to be on the gender equality challenge, particularly in the ICT profession. Data presented in this paper shows that the gender pay gap across the economy is almost 19 per cent and in the ICT profession is around 20 per cent. Female participation in the national workforce is about 43 per cent, but in the ICT profession it is only 28 per cent. The percentage of women in management roles across the economy is only 36 per cent, with the data suggesting it is even lower in the ICT profession. And despite the widely acknowledged skills gap looming in digital technologies and ICT, enrolments and completions of ICT degrees and vocational qualifications have dropped significantly in recent years.

The immediate, short term challenge is to urgently address the barriers to greater female participation in the ICT workforce. Gender equality is clearly an important principle and must be pursued. But in an era of growing shortages of skilled ICT people, there are also compelling economic and national wealth reasons why we need to increase the number of professional ICT women. Moving the gender numbers and ratios in the right direction will require collaboration across relevant stakeholders and a genuine commitment by individual employers to implement practical and effective workplace initiatives. No single organisation can by itself orchestrate and deliver the quantum change needed. It will require a coalition of organisations and leaders working within an agreed strategy with clearly defined goals and targets. Many employers are making significant progress. And there are many groups advocating and urging changes in our workplace cultures, structures and governance. We need to more effectively harness this collective energy, knowledge and goodwill in order to create a wave of change across the entire economy of employers and professionals engaged in the practice of ICT.

RECOMMENDATIONS AND FURTHER ACTIONS

1. In consultation with key partners and stakeholders, develop a strategy to deliver better gender equality outcomes for ICT professionals.

2. Reduce barriers to increased female participation in the ICT workforce by addressing the following issues:

- Leadership, culture and accountability;
- Flexible work practices;
- Mentoring and sponsorship;
- Gender pay equality;
- Targets and quotas; and
- Role models.

3. Develop a coalition of stakeholders – ICT industry and profession, educators, employers, governments and career advisors – to address issues occurring in the primary and secondary education systems that discourage girls from engaging with ICT and computer science. The ACS is prepared to take a lead role in facilitating this approach.

4. Support changes to school educational settings and approaches that make ICT and computer science more appealing to young females, including:

- Provide better advice to female students about ICT career opportunities and provide access to role models;
- Promote the introduction of a Digital Technologies curriculum including coding and computational thinking;
- Provide greater support for groups which provide girls with access to computer coding experiences; and
- Improve the way maths, science and computing are taught to boost the self-confidence of young females.

5. Address issues in the Vocational & Higher Education Sectors that discourage young women from engaging in ICT by collaborating with the Australian Council of Deans of ICT (ACDICT) and other stakeholders to:

- Improve marketing of ICT careers to potential students;
- Establish stronger links between educators and employers to improve information about job opportunities;
- Improve course content, structure and delivery to make them more attractive to female students.

The ACS suggests that it may be most helpful to start this process with a Summit of relevant industry and employer bodies, governments, other professional associations, recruitment organisations and gender equity advocacy bodies aimed at developing strategies and action plans to address gender inequity in the ICT profession. The ACS is equipped and ready to take a lead role in organising this Summit. Furthermore, the ACS recommends in Section 2 of this paper a number of specific initiatives be pursued across five key areas of concern: leadership, culture and accountability; flexible work practices; gender pay equality; the effective use of role models; and mentoring and sponsorship.

The longer term solution to the gender equality issue requires a focus on our education system, and particularly the primary and secondary school systems. This is where the problem first emerges. The research indicates that by the time talented and high achieving girls reach the age of 15, most have essentially dismissed the notion of pursuing an ICT career. This must change. It is a handbrake on our long term ability to capitalise on the economic rewards that digital technologies offer. It is also denying girls and young women the opportunity for rewarding and fulfilling roles in the ICT profession. In Section 3 of this paper, the ACS recommends a number of initiatives to address this situation. Perhaps most important is the recommendation to establish a campaign to educate and inspire young girls about the exciting opportunities available to them in the ICT profession. The use of role models must be one dimension of this campaign but it also requires ensuring that the people who most influence the thinking and aspirations of young female students – their parents, teachers and career advisors – fully understand the career opportunities that ICT offers. The ACS also recommends significant changes to the school curriculum to introduce female students to computer coding and computational thinking at a young age, and a review of the pedagogy to look at how maths, science and computing can be taught in ways which boosts the self-confidence of young girls.

In both our vocational and tertiary education sector, there have been significant falls in ICT enrolments and completions in recent years. This is a matter for serious concern. Our current heavy reliance on importing the ICT skills we need in an extremely competitive global skills market represents an unacceptably high risk for Australia. We can help mitigate against this risk if more of our female population can be motivated to pursue a career in ICT. The ACS recommends initiatives to help reverse this trend, including more effective marketing of ICT careers to potential vocational and tertiary education students; establishing stronger links between universities, the vocational sector and employers to help female students better understand where the job opportunities are; and improving course content, structure and delivery to better encourage and support female participation.

The full set of ACS Recommendations is listed in Attachment 1 while Attachment 2 comprises a detailed Table showing target groups, potential collaboration partners, desired outcomes and suggested achievement dates.

In summary, the lack of women working in ICT is a significant problem which Australia must address, not only for reasons of equality but also because the economic payoff will be significant if we can more fully utilise our human capital. The solution will require a mix of short and long term initiatives. In the short term, we must fundamentally change the cultural mindset and attitudes to women in the workforce. This will require leadership – genuine, committed, outcome-focused leadership. We must also remove various operational and structural barriers that currently exist in the workplace, many of which are legacy issues that have built up over many decades. In the longer term, we need to make some fundamental changes at primary and secondary school which is where the equity issues first emerge. While there is a long gestation period between change at this level and outcomes in the workforce, the changes we recommend will in our view help secure a much larger pipeline of female ICT talent for Australia into the future.

The ACS, as the peak representative body for the ICT profession, seeks to play a constructive leadership role in addressing all aspects of the gender equality challenge.

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2.1 THE TRENDS

This section looks at the trends and current state of play in relation to women's participation in the workforce generally and in the ICT profession in particular. It draws primarily on two data sources - the Australian Bureau of Statistics (ABS) and the Workplace Gender Equality Agency (WGEA). WGEA is an Australian Government statutory agency created by the Workplace Gender Equality Act 2012 and is charged with promoting and improving gender equality in Australian workplaces.

The Act requires non-public sector employers with 100 or more staff to submit a report to the WGEA between 1 April and 31 May each year for the preceding 12 month period (1 April – 31 March reporting period). This legislative requirement means that WGEA is a rich and ongoing source of data on gender equality issues.

2.1.1 Women in the Workforce

The ABS commenced its Labour Force data series[8] in 1978. Since that time, women's participation in the workforce has increased from 35 per cent to just over 45 per cent today.[9] A notable change within the female workforce during this period has been the increase in part-time/casual work. In 1978, 66 per cent of women who worked did so full-time. Now that figure is down to 54 per cent.[10] In terms of representation in management, WGEA data shows that while women account for 48.5 per cent of the workforce, they only represent 35.9 per cent of management roles. This percentage is even lower in the Information Media & Telecommunications and Professional, Scientific & Technical Services sectors (where most ICT professionals work), which both have 31 per cent of management roles held by women.

In an international context, PwC produces an annual Women in Work Index.[11] The third annual update of the Index shows that Australia dropped six places to 15th position out of a sample of 27 OECD countries in 2013. This compares to eighth place in 2011 and ninth in 2012. This drop is due largely to the widening gender pay gap in Australia, which grew from 14 per cent in 2012 to 18 per cent in 2013.
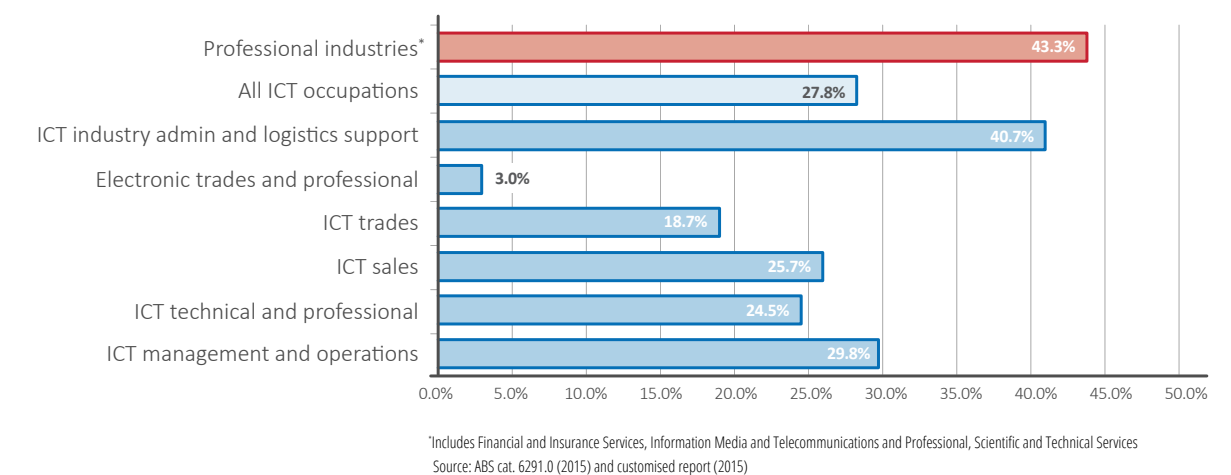
2.1.2 Women in ICT

WGEA's November 2014 Report "Australia's gender equality scorecard"[12] shows that the female percentage of the workforce across all industries is 48.5 per cent. In the Information Media & Telecommunications sector and the Professional, Scientific & Technical Services sector, the female participation levels are below the national level at 40 per cent and 39.3 per cent respectively.[13]

The recent Deloitte Access Economics report, "Australia's Digital Pulse"[14] shows that women are significantly underrepresented in Australian ICT occupations. As shown in Chart 2.1.2 below, compared to the wider professional industries where women represent 43 per cent of the workforce, women represent only 27.8 per cent of the ICT workforce.

Chart 2.1.2 – Share of women in ICT occupations, 2014

Source: Deloitte Access Economics report, "Australia's Digital Pulse"– June 2015 – page 11

Occupation	Percentage
Professional industries*	43.3%
All ICT occupations	27.8%
ICT industry admin and logistics support	40.7%
Electronic trades and professional	3.0%
ICT trades	18.7%
ICT sales	25.7%
ICT technical and professional	24.5%
ICT management and operations	29.8%

*Includes Financial and Insurance Services, Information Media and Telecommunications and Professional, Scientific and Technical Services
Source: ABS cat. 6291.0 (2015) and customised report (2015)

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[9] Australian Bureau of Statistics - Source: ABS 6202.0

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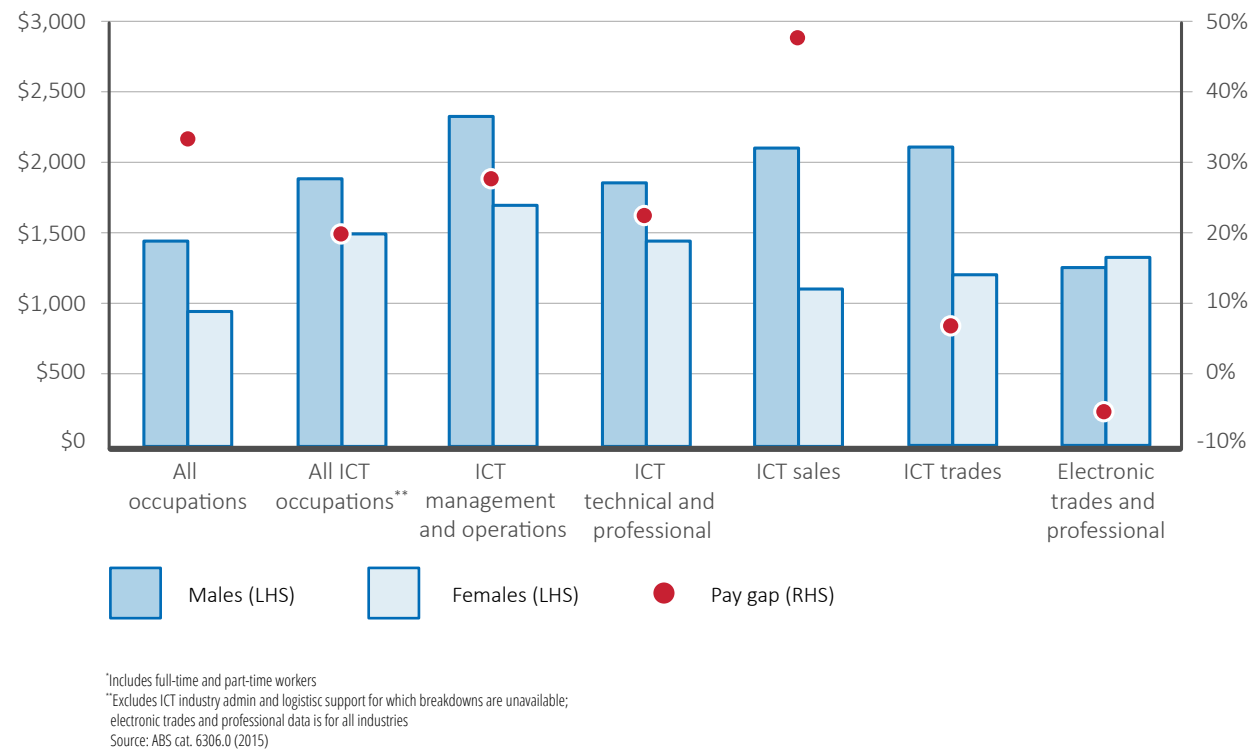
2.1.3 The Gender Pay Gap

The gender pay gap (GPG) is the difference between women's and men's average weekly full-time equivalent earnings, expressed as a percentage of men's earnings. WGEA calculates the national GPG using ABS Average Weekly Full-Time Earnings data (cat. no. 6302.0). According to WGEA's May 2015 Fact Sheet "Gender pay gap statistics",[15] the national GPG is currently 18.8 per cent. Unfortunately the gap has widened in the last 10 years from 14.4 per cent in 2004.[16] WGEA analysis of pay gap by industry sector indicates that for the Information Media & Telecommunications and Professional, Scientific & Technical services sectors, the GPG is virtually at or above (18.1 per cent and 28 per cent respectively) the all industries figure of 18.8 per cent.[17] The Deloitte Access Economics report, "Australia's Digital Pulse" reports similar pay gap results for ICT workers, noting an average pay gap of around 20 per cent. See Chart 2.1.3 below.

Chart: 2.1.3 – Average Total Weekly Earnings of ICT Occupations by Gender, May 2014

Source: Deloitte Access Economics report, "Australia's Digital Pulse"– June 2015 – page 13

Males (LHS)   Females (LHS)   ● Pay gap (RHS)

*Includes full-time and part-time workers
**Excludes ICT industry admin and logistisc support for which breakdowns are unavailable; electronic trades and professional data is for all industries
Source: ABS cat. 6306.0 (2015)

2.1.4 The "Leaky Pipeline" Problem

As outlined in Section 2.1.2 above, female representation in the ICT profession is well below female representation in other professions. Compounding this problem is what is often referred to as the "leaky pipeline" problem. The number of women leaving the ICT profession is significant. A Harvard Business Review (HBR) study[18] in the United States in 2008 found that over time 56 per cent of female ICT workers in the private sector leave their roles. Some pursue ICT employment elsewhere. However, of that 56 per cent, around 50 per cent leave the profession entirely.

The HBR study attributes this high drop-out rate to a mix of factors, but principally cites a hostile macho culture, isolation in the workforce, unclear and/or stalled career paths, inferior systems of rewards and extreme work pressures. The study goes on to note that the female attrition rate accelerates and peaks when women are in their mid to late 30s, which is generally 10-15 years into their career. This is generally the period when women find both family and career pressures increasing simultaneously. The HBR report refers to it as "the fight-or-flight moment."

While the HBR study is somewhat dated, more recent analysis by the United States National Centre for Women Information Technology[19] suggests the same dimensions of the "leaky pipeline" problem persist today. There are, unfortunately, no similar studies on the female attrition rate in ICT in Australia. However, given that the trends in other key indicators of gender imbalance in ICT are broadly similar here and internationally, the ACS believes it is safe to assume that Australia suffers from a similar "leaky pipeline" problem. Applying the attrition rates from the HBR study, the ACS estimates this means that over time, we are losing somewhere between 35,000 and 40,000 women from the ICT talent pool. Even if we could reduce that attrition rate by only 25 per cent that would mean up to another 10,000 female workers would be retained in the ICT profession.

2.2 UNCONSCIOUS GENDER BIAS AND STEREOTYPING

The key factors contributing to the gender inequality outcomes (including the "leaky pipeline" phenomena) are unconscious gender bias and stereotyping. Gender stereotyping starts essentially at birth and continues through school years, into work and career and then has impacts in retirement years. The WGEA paper "Different genders, different lives"[20] summarises the biases and stereotyping behaviours that occur throughout the key phases of the female life cycle.

- **From birth and into school years** - 'appropriate' behaviour for boys and girls is defined early. "Boys are encouraged to be tough and play competitive games whilst girls should be more caring, gentle and look after others."[21] Research identified by WGEA suggests these 'gendered behaviours' are not so much built into our DNA but develop over time. So they are more a function of environmental and social factors than being innate.

- **The career phase** – upon entering the workforce, the gender pay gap emerges for graduates. According to the Graduate Careers Australia GradStats 2014,[22] the median full-time employment starting salary for graduate men in Australia was $55,000, compared to $52,000 for women. For computing science graduates in 2014, the median full time starting salary for men was $55,000 and for women $53,500. Even after completing an MBA, women were likely to start jobs at a lower level and lower salary than men.

- **In the workforce** - women are less likely to be assertive in the workplace than men. This impacts on their negotiation skills and therefore their ability to advance their careers and improve their remuneration. Why are women less successful negotiators? The WGEA references three factors, drawn from a variety of studies and discussed in its paper, "Negotiation: how it works (or doesn't work) for women and why it matters".[23] First, according to a study by Genat, Wood and Sojo[24] "women are generally perceived as communal (caring, communicative and encouraging) and men as agentic (ambitious, assertive, decisive and self-reliant)." Negotiation is usually associated with agentic behaviour. Therefore, when employers negotiate with women, they tend to offer less and are more likely to resist attempts to influence. Second, women's reluctance to enter negotiations is partly because they are often penalised more than men for doing so. Women who are seen as assertive or aggressive can experience resistance and even backlash for doing so. So unsurprisingly, some women will avoid negotiation. And thirdly, research into bargaining and negotiating practice finds that when there is little or no contact between the men and women, outcomes are comparable. It is mostly in face-to-face negotiations that outcomes suffer.

- **Balancing career and parenthood** - 'human capital' is a person's accrued knowledge, skill, experience and ability. A person's human capital accumulates over time and impacts on remuneration and career paths. The growth of human capital stops or slows without continuous employment. So when women drop out of employment or take reduced employment while raising children, their human capital "value" is reduced.

- **Retirement phase** – career gender biases can limit the ability of women to secure a financially healthy retirement. The Australian Human Rights Commission presents estimates from 2009/2010 indicating that the average (mean) superannuation payouts for women are just over half (57 per cent) of those of men: $198,000 for men compared to $112,600 for women (based on superannuation balances for the age group 60-64 years).[25] However, the average measures do not reveal the significant proportion of women who have little or no superannuation. It is estimated that 50 per cent of women approaching retirement (aged 55-59 years) have superannuation balances of $25,000 or less. In addition, in 2010-11, just under half of retired women in Australia had made no contributions to a superannuation scheme compared to 25 per cent of men.

The challenge women face to secure a healthy retirement income is further highlighted in a 2012 Income and Wealth report prepared by the National Centre for Social and Economic Modelling (NATSEM) for AMP Financial Services.[26] The report found that "a postgraduate woman aged 25 years can expect to earn $2.49 million, just two-thirds of her male counterpart's lifetime earnings ($3.78 million). More striking is the fact that women with post-graduate qualifications would earn only as much on average over their lifetime as men with a certificate or Year 12."

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2.3 ADDRESSING GENDER INEQUALITY

Effectively addressing gender inequality will require simultaneous action on a number of fronts. The ACS suggests the five key areas are: leadership, culture and accountability; flexible work practices; gender pay equality; the use of role models; and mentoring and sponsorship.

2.3.1 Leadership, Culture and Accountability

In any organisation, the Chief Executive Officer (CEO) and leadership team can have the biggest impact on cultural change through their own actions and through the governance and accountability systems they set up internally. The best starting point is a clear acknowledgement at the leadership level that gender equality is a critical strategic business issue. It is not a Human Resources issue, but must be seen as a critical factor in achieving the organisation's strategic goals. Good outcomes on equality translate into good outcomes for the business and the bottom line. Gender equality must be "built in" to organisational thinking, not "bolted on." All layers of management must be given clear accountabilities to deliver against the gender equality KPIs. This will require identifying the key barriers, implementing action plans to address the barriers, being clear on targets and consequences for non-achievement, and having systems in place which allow transparent reporting of progress against targets.

2.3.2 Flexible Work Practices

If we were to start today with a blank sheet of paper and design a workplace that reflects the society in which we now live, it would look very different from most of the workplaces that currently exist.

In particular, it would take into account factors such as:

- the greater emphasis by parents on shared caring for their children;

- two income families becoming the norm;

- the increasing importance placed on achieving better work/life balance;

- the economic imperative that requires higher participation by women in the workforce; and

- technology platforms which allow us to work from virtually anywhere at any time.

For most of the population, their current workplace reflects the cultural attitudes and mores of past generations. Changing those workplaces will be a significant challenge requiring genuine, committed leadership and an investment of time and resources. However, the challenge must be met. We need to build a new paradigm that encourages both genders to contribute to their full potential.

2.3.3 Mentoring and Sponsorship

Mentoring and sponsorship both seek to improve a person's career and are often recommended as tools for addressing gender inequality issues. However, there are important differences between the two. Mentoring essentially involves providing psychological support through friendship, guidance and counselling. Sponsorship is direct, career-related support provided by a person in a more senior position who can provide direct access to opportunities and who can be a strong advocate within the organisation. Sponsorship is increasingly seen as the most effective strategy for fast-tracking the careers of high-performing individuals. A 2011 report by the Catalyst group[27] notes that - "Sponsorship matters. In fact, high-level sponsors can help make or break a woman's career and can tip the scales for high-potential executives. At the same time, sponsorship benefits the organisation, so it cannot be left to chance. It's not enough to say "it's a good thing"; organisations must create an environment where sponsorship thrives."

2.3.4 Targets and Quotas

Targets and quotas both aim to improve gender equality in an organisation. However, targets are voluntary while quotas are mandated by an external organisation. While both can be effective in addressing gender inequality, the ACS favours the use of targets. In essence, we see quotas as a blunt instrument which can have unintended adverse outcomes. The principal advantages of targets over quotas are:

- Targets can be tailored and monitored on an individual company basis appropriate to the circumstances, culture and environment of that organisation. Quotas take no account of the individual organisation's circumstances.

- Companies setting their own targets will likely take greater ownership of the target and the leaders are more likely to buy in to the objectives. Quotas, because they are imposed from outside, can create resentment and are seen as a cost imposition.

- Targets can be applied at various management levels within an organisation and as such promote a genuine whole-of-business change in philosophy and approach. Quotas, on the other hand, are easiest to set for Board or CEO level positions only.

- Quotas can undermine the important workplace principle of progression through individual merit. For example, quotas may result in good male candidates being overlooked or disadvantaged. They may also mean that some women who progress may be regarded unfavourably because they are viewed by some as simply being a beneficiary of a quota requirement.

2.3.5 Role Models

A key reason girls and women do not pursue careers in ICT is that the profession has an image problem. The stereotypical ICT person is seen as "…a 25-year-old, hoodie-clad dude who wears glasses, is antisocial, and loves to hack strings of code in the basement of his parents' home, eating stale pizza and drinking Red Bull until 3 or 4am."[28] This stereotype image must be changed. One way to do that is to identify successful females in ICT and use them as role models. The Business Dictionary defines a role model as "…someone who other individuals aspire to be like, either in the present or in the future."[29] What then are the qualities we need to be looking for to identify appropriate role models in Australia? Based on a survey of students, research by Marilyn Price-Mitchell PhD,[30] suggests the top five qualities which define a role model are:

- Passion and Ability to Inspire;

- A Clear Set of Values;

- Commitment to Community;

- Selflessness and Acceptance of Others; and

- The Ability to Overcome Obstacles.

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2.4 CREATION OF A COALITION

The ACS is seeing an increasing willingness amongst employers, governments and the wider community to actively address the inequity issue. This is clearly encouraging and gives us hope that, as a nation, we are genuinely on a trajectory to improve gender equality outcomes.

The challenge, however, is how to harness and leverage the emerging good intent and actions for maximum impact for the ICT profession. Since no single organisation can by itself materially move the equity indicators and outcomes in the right direction, collaboration amongst the key stakeholders is critical for success.

Thus, an important first step is a Summit where the key stakeholders - employers, the profession, recruiters, governments and key advocacy bodies such as WGEA – can come together and develop a strategy to deliver better gender equality outcomes for ICT professionals. The ACS is equipped and ready to take the lead role in this and proposes organising a Summit within six months of the launch of this paper.

In terms of the specific issues identified above and which must be addressed at the Summit, the ACS recommends the following:

Leadership, culture and accountability

Leadership, culture and accountability – the ACS believes there is much to be learned from the approach taken by the Male Champions of Change (MCC) group established in 2010 by Elizabeth Broderick, our most recent Sex Discrimination Commissioner. The essence of the MCC model is that men of significant power and influence can, by working in coalition and with genuine commitment to gender equity, make very significant changes to gender equality outcomes. And that is certainly proving to be the case. Drawing on the experience and results being achieved by the MCC, the ACS recommends the following to employers of female ICT professionals:

- Leaders must reflect on their own attitudes and practices, and question whether they are sending the right signals around gender balance to their organisations. This goes to the heart of setting the right culture.

- Leaders must build gender equality and gender awareness in their senior management ranks.

- Commit to transparency. Publish equity targets and performance against those targets.

- Ensure that suppliers understand the organisation's commitment to gender equality and encourage them to pursue similar equality outcomes. The ACS supports the MCC suggestion that this be done via a Supplier Code of Conduct which sets expectations around gender equality.

- Set gender balance targets in the recruitment process.

- Implement parent-focused career strategies. Culturally, this involves organisations celebrating and embracing parenthood. Operationally, it means reviewing the parental leave process and outcomes, staying in touch with those on parental leave, monitoring career progression after parental leave to identify cases where roadblocks seem to be occurring, and assessing the appropriateness and affordability of child care options.

Flexible work practices

Flexible work practices – there needs to be a significant mindset change here. The ACS recommends that the fundamental change required is for employers or managers to ask the question: "What work can't be done flexibly?" Most employers today ask the opposite: "What work can be done flexibly?" Companies such as Telstra, ANZ and the ASX have now adopted a policy called "All Roles Flex". Telstra led the way with this initiative in March 2014. In essence, it means that flexibility in some form is available and open for discussion in all roles. Flexibility can include part-time work, different working hours or working from different locations. As a minimum, the ACS recommends organisations benchmark their flexible procedures against best practice. WGEA, for example, has a set of criteria in order to be recognised as an 'employer of choice' which the ACS endorses and encourages organisations to embrace. The ACS also believes there needs to be change in attitude on the issue of part-time versus full-time work. The focus needs to be on employee outcomes rather than simply hours worked and/or where the work is performed (ie at home or at the office).

Gender pay equality

Gender pay equality – the ACS recommends organisations implement internal reviews to ensure that women performing roles similar to men, and at acceptable levels, automatically have their salaries adjusted to bring salaries to parity. Encouragingly, the ACS understands this is currently being done by a number of large organisations in both the ICT sector and beyond.

Targets and quotas

Set KPIs or targets at all management levels to deliver improved equity outcomes. The ACS favours targets as opposed to quotas for the reasons outlined in section 2.3.4 above.

Role models

The ACS recommends establishment of an Ambassador-style program which involves successful women in ICT participating in a mix of advocacy and marketing activities aimed at inspiring females to pursue a career as an ICT professional. The campaign should also encourage women to "call out" discrimination and other obstacles which retard career progression. The ACS already promotes female role models through its membership and is keen to take a leadership role in establishing an Ambassador program more widely.

Mentors and sponsors

The ACS recommends employers give serious consideration to establishing mentoring or sponsor programs. Done properly, they have proven to be an effective way of providing career support for female ICT practitioners. As noted in 2.3.3 above, sponsor programs in particular are now generally regarded as the more effective of the two approaches. The ACS itself has considerable experience in running mentoring programs and plans to enhance the breadth of its program over coming years, including the possibility of working closely with individual employers.
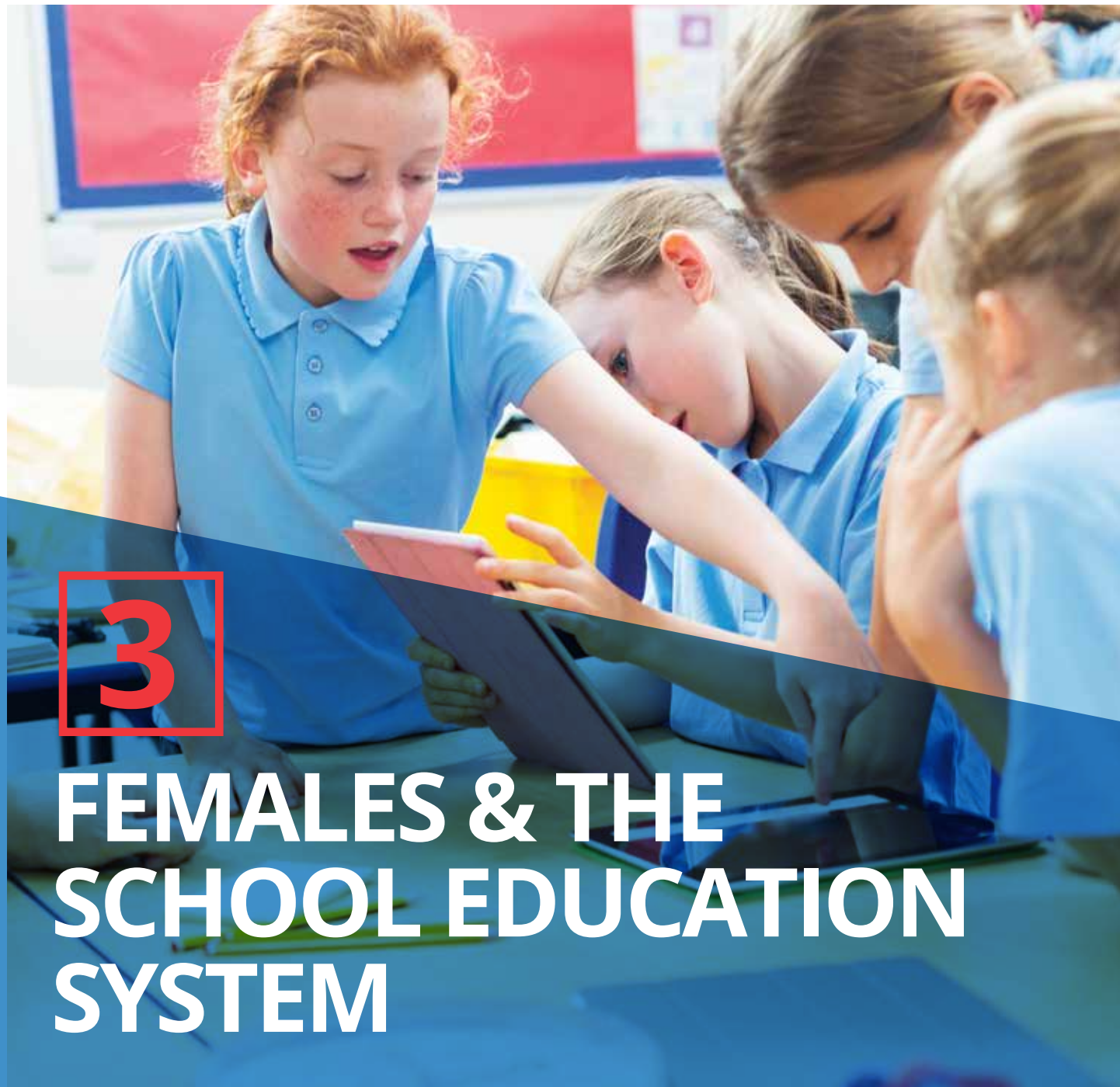
3

FEMALES & THE SCHOOL EDUCATION SYSTEM

3.1 INTRODUCTION

Gender equality in learning and education is an area that has received relatively little public attention and policy focus. Yet outcomes in our education system are critical to our end goals.

The years spent in the education system are where so many of our aspirations are shaped, our aptitudes are identified, and our skills and competencies are developed. Gender equality outcomes at the career and employer level are shaped very much by factors at work in the education system. This is certainly the case in relation to careers in ICT. There is strong evidence that the underrepresentation of women in the ICT profession can be traced back to the school education system and factors which impact on the career aspirations of young girls. An OECD 2015 report "The ABC of Gender Equality in Education: Aptitude, Behaviour, Confidence"[31] captures data on the expectation of school students about future careers. It shows that, on average among OECD countries, only 4.6 per cent of girls contemplate pursuing careers in engineering or computing compared to 18.2 per cent of boys. In Australia, the numbers are 2.8 per cent and 16.3 per cent respectively.[32] Furthermore, there is no OECD country where the number of girls thinking of computing and engineering as their future career exceeds the number of boys contemplating such a career. On average, there are almost four times as many boys as girls who expect to be employed in engineering and computing in OECD countries.

3.2 WHAT IS HAPPENING IN SCHOOLS AND WHY?

The ACS used three sources of data in order to explore this topic:

1. The OECD report, "The ABC of Gender Equality in Education: Aptitude, Behaviour, Confidence", which is noted above in section 3.1;
2. An extensive literature review conducted by the ACS Women Board; and
3. A 2014 study by Google titled, "Women Who Choose Computer Science – What Really Matters"[33]

OECD Study

This study provides an extensive international comparison and analysis of barriers to gender equality in education outcomes. Maths and/or science proficiency is generally regarded as a key requirement for someone wishing to pursue a career in ICT. A core finding from the OECD report is that amongst high performing students, girls do worse than boys in both mathematics and science. The average difference across the OECD in the top 10 per cent of maths students is 19.5 score points. In Australia, the difference is 20.2 score points. In no country do girls outperform boys at this level of maths. The average difference across the OECD in the top 10 per cent of science students is 10.7 score points, however in Australia, the difference is 11.7 score points. Why is this happening? The OECD report concludes that the key contributing factors are a mix of the following:

1. **Lack of self-efficacy and self-concept** - girls in general have lower levels of confidence in both maths and science. Across OECD countries, the self-efficacy difference in maths is 49 score points (55 score points in Australia) and in science, 37 score points (44 score points in Australia). The OECD suggests this is the equivalent of one year of school. In terms of self-concept across the OECD, boys were 11 per cent more likely than girls to agree or strongly agree that advanced science would be easy for them (in Australia the difference is 9.6 per cent).

2. **The influence of parents** - parents were more likely to expect their sons, rather than their daughters, to work in a science, technology, engineering or mathematics (STEM) field.

3. **Teacher gender biases** - teachers need to help build self-confidence in girls by, for example, providing positive reinforcement for the maths and science work girls do well and offering them opportunities to "think like scientists" in situations where making mistakes does not have consequences for their marks.

4. **Career advice** - schools need to place a higher priority on providing quality, contemporary and well-informed career advice to students. This is particularly important in relation to careers in ICT where the stereotype is along the lines of a 25-year-old antisocial male working on coding and programming in a remote back office. The reality is significantly different. Changing perceptions of ICT will require the involvement of teachers, parents, career advisors and the business community.

ACS Women Literature Review

The Board of ACS Women has also undertaken an extensive literature review on the gender inequality outcomes in education. The summarised conclusion is that the literature suggests the key factors behind females' underrepresentation in ICT include self-efficacy, stereotypical image, single-sex settings, misconceptions of ICT, and influential factors for choosing computer science such as parental influence, classroom climate and the effect of gender-roles.

> "...teachers need to help build self-confidence in girls by, for example, providing positive reinforcement for the maths and science work girls do well and offering them opportunities to 'think like scientists'"

References

[31] OECD, 2012, The ABC of Gender Equality in Education – Aptitude, Behaviour, Confidence - http://www.oecd.org/pisa/keyfindings/pisa-2012-results-gender-eng.pdf

[32] OECD, 2012, The ABC of Gender Equality in Education – Aptitude, Behaviour, Confidence - http://www.oecd.org/pisa/keyfindings/pisa-2012-results-gender-eng.pdf - page 114

[33] Google, 2014, Women Who Choose Computer Science – What Really Matters - http://static.googleusercontent.com/media/www.wenca.cn/en/us/edu/pdf/women-who-choose-what-really.pdf

Google Study

Google conducted its study in response to the negative trends they were seeing in relation to women pursuing computer science degrees. As noted by Google, the US National Science Board's report "Science and Engineering Indicators for 2012" found female participation in Computer Science had declined to 18 per cent from a 37 per cent peak in the mid-1980s.[34] The Google study, based on a survey of 1,000 women and 600 men, concluded the top four factors are, in descending order by level of influence:

- **Social encouragement** – positive reinforcement from family and peers comprises 28.1 per cent of the explainable factors influencing a young woman's decision to pursue computer science.

- **Career perception** – how a young woman perceives computer science as a career comprises 27.5 per cent of her decision. Figure 3.2 below from the Google study neatly summarises the perception issue. As noted by Google – "...young women unfamiliar with Computer Science and its broad applications have difficulty visualizing it outside the narrow scope often presented in popular media. They may be unable to perceive Computer Science as a career that fulfils both the academic passion (inventing, problem solving, exploration, etc.) and the intangible, social passions (helping people, conservation, medical breakthroughs, etc.) that make a profession personally rewarding."

- **Academic exposure** – previous exposure to computing science accounts for 22.4 per cent of the explainable factors. The study found that regardless of how girls were exposed to computing science (eg, through formal course work or extra-curricular activities), they were more likely to consider a computer science degree than those without those opportunities.

- **Self-perception** – a girl's interest in and perceptions of her own proficiency in maths and problem-solving comprise 17.1 per cent of the explainable factors.

The Google study concludes with the following key insight - "The most heartening outcome of the study is the limited role that uncontrollable factors play in influencing the pursuit of a computer science degree. For example...uncontrollable factors like household income and ethnicity contribute only 4.9% to the explainable factors—statistically insignificant when compared to factors that can be controlled. This means that while factors like natural aptitude and the breadth of academic exposure may influence success in the field, it is controllable factors like encouragement and topical exposure that influence and generate interest in the field and a desire to pursue educational opportunities."

Figure 3.2

Source: Google Study – "Women who choose computer science – what really matters" – 26 May 2014, page 7

Word associate by females **familiar** with computer science

Word associate by females **unfamiliar** with computer science

3.3 POSSIBLE COLLABORATIONS TO BRING ABOUT CHANGE

The clear message from the research is that by the time girls reach 15, a large proportion have either already dismissed or not even considered the option of a career in ICT. The main reasons appear to be:

1. **A lack of self-confidence compared to boys in their own abilities in maths and science, the foundation subjects for a subsequent career in ICT;**

2. **A school environment which does not actively encourage or promote the idea of a career in ICT. In particular:**

a. teachers, parents and career advisors display attitudes which effectively stereotype ICT careers as a male domain;

b. there is a lack of opportunity to engage in computing science related subjects;

c. the pedagogy tends not to teach maths in particular in a way which addresses the self-confidence issue of girls; and

d. negative perceptions persist about the opportunities and fulfilment a career in ICT can offer.

To address these issues, the ACS supports the creation of a coalition between the ICT industry and profession, educators, employers, government and career advisors to work collaboratively to develop strategies to effectively tackle the issues. The ACS is well placed through its close collaboration with ICT educators nationally to take a leadership role in this task.

In terms of specifics, the ACS recommends that the strategy should, as a minimum, include the following elements:

- A program aimed at changing perceptions of what a career in the ICT profession can offer. This will involve providing female students with accurate and contemporary advice on the jobs of the future, the increasing importance of ICT skills in this future, and the significant opportunities for rewarding and fulfilling careers for those with highly developed specialist ICT qualifications and skills. This program must involve the ICT profession and industry working closely with teachers, parents and in particular career advisory professionals. Importantly, it should also involve identifying and utilising appropriate female ICT role models;

- Stronger and more co-ordinated support for groups such as Code Club, Robogals, Go Girl, Go for IT and other such groups which are providing female students with access to computer coding experiences;

- Working with Governments to introduce a mandatory Digital Technologies curriculum as soon as possible, including providing assistance with a structured training and ongoing professional development program for ICT teachers; and

- A review of the pedagogy with a view to recommending changes which address the way maths and computer science, in particular, are presented and taught to female students.

"The clear message from the research is that by the time girls reach 15, a large proportion have either already dismissed or not even considered the option of a career in ICT."

References

34 National Science Board, 2012, Science and Engineering Indicators 2012 - http://www.nsf.gov/statistics/seind12/

4

FEMALES AND THE VOCATIONAL AND HIGHER EDUCATION SECTORS

4.1 THE TRENDS

In recent years, there has been a decline in the overall level of ICT enrolments and completions in both the vocational and tertiary sectors as well as a drop in the number of female students.

4.1.1 The Vocational Sector

Innovation & Business Skills Australia (IBSA) is one of 11 Industry Skills Councils authorised by the Australian Government to be an official voice on vocational education and training across six industries. IBSA produces an annual Environment Scan for the ICT and Telecommunications industry which provides data on the vocational sector generally and also identifies key factors having an impact on the skill needs of the workforce.

The IBSA Environment Scan 2015[35] indicates the following in relation to the vocational sector ICT training package:

- Enrolments declined by 22.7 per cent between 2010 and 2013, falling from 60,233 to 53,584.

- Qualifications issued fell by 22.4 per cent from 2010-2013, dropping from 13,515 to 13,027.

- Female enrolments in 2013 represented only 24 per cent of total enrolments.

- Female enrolments plunged 39 per cent between 2010 and 2013, slipping from 18,421 to 11,262.

While the IBSA report does not specifically address the reasons why female enrolments are declining, it suggests the fall in overall enrolments is due to a mix of the following;

- Employers are increasingly demanding multi-skilled ICT workers, such as people with a mix of technical ICT skills as well as skills in adjacent areas such as electrotechnology and engineering. The current vocational system is siloed and cannot easily deliver this skills mix.

- The value of qualifications is lessening and the value of a particular skill is increasing.

- Qualifications can take too long to achieve and are often perceived as requiring learnings that are unnecessary.

IBSA notes that the vocational sector does need to attract and retain more women, and suggests a key priority for the ICT industry is to "mentor and coach women into training and work." (pg 40)

"... a key priority for the ICT industry is to "mentor and coach women into training and work."

References

35 https://www.ibsa.org.au/sites/default/files/media/IBSA%20Environment%20Scan%202015%20Information%20%26%20Communications%20Technology%20Industry.pdf

4.1.2 The Tertiary Sector

An OECD study "Education at a Glance 2014: OECD Indicators"[36] notes that tertiary graduates in most fields of study across the OECD in 2012 were predominately female. In contrast, women were only a small proportion of those studying degrees in the fields of engineering, manufacturing and construction (28 per cent) and computing (20 per cent). The comparable computing percentage for Australia was 20 per cent in 2012 (26 per cent in 2000).

Australia's falling enrolments (male and female) in computing science or ICT degrees is also the subject of discussion in the Deloitte Access Economics report, "Australia's Digital Pulse."[37] See Chart 4.1.2 below. Deloitte noted that:
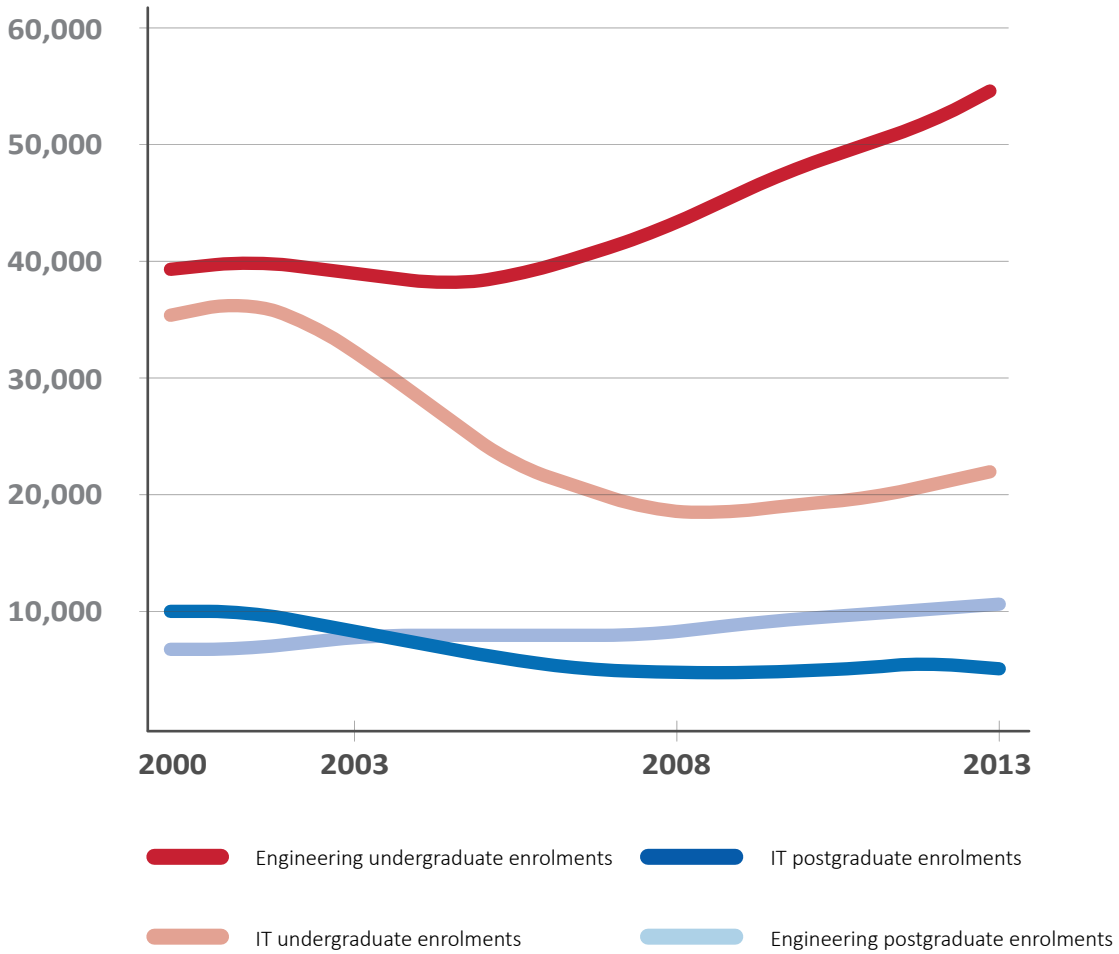
"Enrolments in IT degrees specifically have seen weak periods over recent years. Domestic IT enrolments peaked in the early 2000s during the 'dot-com boom', but declined sharply over the 2000s despite a generally prosperous period for the broader economy. Domestic IT enrolments stabilised around the time of the global financial crisis in 2008 and have gradually increased since then, though they have remained well below previous highs. Completions of IT degrees have followed a similar path to enrolments, peaking in the early 2000s before declining and stabilising over recent years."

In terms of the gender breakdown of the enrolment numbers, since 2001, male ICT undergraduate enrolments have declined by almost 30 per cent (from 27,034 in 2001 to 19,023 in 2013), while female enrolments have declined by 65 per cent (from 8,627 to 3,032).[38]

A Commonwealth Department of Education report on "Undergraduate Applications, Offers and Acceptances 2014"[39] noted that 227,394 offers were made in 2014, an increase of 1.2 per cent over the previous year. Applications by females represented 57.8 per cent of total applications, compared to 57.6 per cent in 2013. In terms of the applications by field of education, there was a decrease in applications for Information Technology (-1.7 per cent) and Engineering and Related Technologies (-6.0 per cent).[40] The United States' experience is similar to Australia. According to Girls Who Code,[41] women now represent 18 per cent of all computer science graduates, a fall from 37 per cent in 1984. Further, they note that "while 74% of girls in middle school express an interest in STEM subjects, when choosing a college major, just 0.3% of female secondary school students select computer science."

Chart 4.1.2: Domestic enrolments by field of education, 2001-2013

Source: Deloitte Access Economics report, "Australia's Digital Pulse"– 2015 - Section 2, page 26

Legend:
- Engineering undergraduate enrolments
- IT postgraduate enrolments
- IT undergraduate enrolments
- Engineering postgraduate enrolments

Source: Department of Education u-Cube (2015)

4.2 Future Remedies Through Partnership

Section 4.1 above highlights the significant fall in ICT enrolments and completions, particularly amongst females, which has occurred in Australia in recent years. Over time, this can be expected to improve to some extent if we can significantly increase interest among female school students in pursuing an ICT career. However, there is a long gestation period before this becomes a reality. Therefore, we need strong and immediate action by the tertiary sector to help address the gender imbalance in computing graduates.

The ACS commits to work with the Australian Council of Deans of ICT (ACDICT) and other relevant stakeholders in the tertiary sector to:

- Develop more effective ways of marketing ICT careers to potential vocational and tertiary education students;
- Establish stronger links between universities, the vocational sector and employers to help female students better understand where job opportunities exist; and
- Improve course content, structure and delivery to ensure that they encourage and support female participation and engagement.

> "… we need strong and immediate action by the tertiary sector to help address the gender imbalance in computing graduates."

References

[36] OECD, 2014, Education at a Glance 2014 – OECD Indicators - http://www.oecd.org/edu/Education-at-a-Glance-2014.pdf

[37] Deloitte Access Economics, 2015, Australia's Digital Pulse, Sydney: Australian Computer Society - http://www.acs.org.au/__data/assets/pdf_file/0006/69720/02062015-Australias-Digital-Pulse-FINAL.PDF

[38] Australian Government, Department of Education, u-Cube 2015

[39] Australian Government, Department of Education, 2014, Undergraduate Applications, Offers and Acceptances 2014 - http://docs.education.gov.au/system/files/doc/other/undergraduate_applications_offers_and_acceptances_2014_0.pdf

[40] Australian Government, Department of Education, 2014, Undergraduate Applications, Offers and Acceptances 2014 - http://docs.education.gov.au/system/files/doc/other/undergraduate_applications_offers_and_acceptances_2014_0.pdf, Section 3.5, Page 15

[41] Brown, K.V., 2014, SFGate, Tech shift: More women in computer science classes - http://www.sfgate.com/education/article/Tech-shift-More-women-in-computer-science-classes-5243026.php

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CONCLUSIONS

Access to the necessary supply of human capital is a key factor in determining whether our nation realises its full economic potential. However, numerous studies suggest that Australia faces a significant and growing shortage in ICT skills – skills which are increasingly critical in a digitally disrupted world. This shortfall, if not addressed, will jeopardise our ability to achieve our potential. One response to this challenge must be to encourage more women to enter the workforce and, in particular, to pursue careers as ICT professionals. With women currently accounting for only 28 per cent of the ICT professional workforce in Australia, this represents a significant underutilisation of our human ICT capital.

This paper highlights that the problem starts in the school system. For a variety of reasons, young girls don't consider a career in ICT. This paper contains a number of recommendations as to how we can change this, for change it we must. Inevitably, there will be a long gestation period between making school-based changes and seeing the results filter through to the workforce. So, in parallel with those changes, we must also focus on the current workforce and take steps both to retain and promote current women ICT professionals and also to encourage women in non-ICT roles to seriously consider ICT as an appealing alternative.

If we fail to effectively address the gender inequality issue, our country will be the poorer for it. The goals outlined in this paper are achievable, but we must act now. The arguments are compelling, but success will require close collaboration and a genuine commitment from all stakeholders to change legacy practices and attitudes.

"If we fail to effectively address the gender inequality issue, our country will be the poorer for it."

6

ABOUT THE ACS

The Australian Computer Society was formed in 1966 and is Australia's peak body for ICT professionals with over 22,000 members and a national footprint. A core function of the ACS is the assessment and accreditation of its members as Certified Technologists or Certified Professionals.

Assessments are conducted against an internationally accepted framework called Skills Framework for the Information Age (SFIA). To retain professional status, the ACS requires certified members to undertake ongoing professional development activities. The ACS also conducts research-based advocacy on behalf of members on ICT skills issues. For more information about the ACS, please see **www.acs.org.au.**

7 KEY RECOMMENDATIONS

ATTACHMENT 1

This paper draws on a significant body of research on the issue of gender equality in the ICT profession to paint a picture of the current state of affairs in Australia. Based on a combination of the research findings and expertise within our own ACS membership, we have made a number of recommendations aimed at significantly improving female participation in ICT.

Female Participation in the Workforce

Recommendation 1

The ACS recommends that the important first step is to collaborate with key partners and stakeholders - employers, the profession, recruiters, government and key advocacy bodies such as WGEA - to define a strategy for delivering better gender equality outcomes for ICT professionals. The ACS is equipped and ready to take the lead role in this and proposes organising a Summit within six months of the launch of this paper.

Recommendation 2

Reduce barriers to increased female participation in the ICT workforce by addressing the following issues:

Leadership, culture and accountability

The ACS believes there is much to be learned from the approach taken by the Male Champions of Change (MCC) group established in 2010 by Elizabeth Broderick, our most recent Sex Discrimination Commissioner. The essence of the MCC model is that men of significant power and influence can, by working in coalition and with genuine commitment to gender equity, make very significant changes to gender equality outcomes. And that is certainly proving to be the case. Drawing on the experience and results being achieved by the MCC, the ACS recommends the following to employers of female ICT professionals;

- Leaders must reflect on their own attitudes and practices and question whether they are sending the right signals around gender balance to their organisations. This goes to the heart of setting the right culture.
- Leaders must build gender equality and gender awareness in their senior management ranks.
- Commit to transparency. Publish equity targets and track performance against those targets.
- Ensure suppliers understand the organisation's commitment to gender equality and encourage them to pursue similar equality outcomes. The ACS supports the MCC suggestion that this be done via a Supplier Code of Conduct which sets expectations around gender equality.
- Set gender balance targets in the recruitment process.

- Implement parent-focused career strategies. Culturally, this involves organisations celebrating and embracing parenthood. Operationally, it means reviewing the parental leave process and outcomes, staying in touch with those on parental leave, monitoring career progression post parental leave to identify cases where roadblocks seem to be occurring, and assessing the appropriateness and affordability of child care options.

Flexible work practices

There needs to be a significant mindset change here. The ACS recommends that the fundamental change required is for employers or managers to ask the question: "What work can't be done flexibly?" Most employers today ask the opposite: "What work can be done flexibly?" Companies such as Telstra, ANZ and the ASX have now adopted a policy called "All Roles Flex". Telstra led the way with this initiative in March 2014. In essence, it means that flexibility in some form is available and open for discussion in all roles. Flexibility can include part-time work, different working hours, or working from different locations. As a minimum, the ACS recommends organisations benchmark their flexible procedures against best practice. For example, WGEA has a set of criteria in order to be recognised as an ' employer of choice' which the ACS endorses and encourages organisations to embrace. The ACS also believes there needs to be a change in attitude on the issue of part-time versus full-time work. The focus needs to be on employee outcomes rather than simply hours worked and/or where the work is performed (ie at home or at the office).

Gender pay equality

The ACS recommends organisations implement internal reviews to ensure that women performing roles similar to men, and at acceptable levels, automatically have their salaries adjusted to bring salaries to parity. Encouragingly, the ACS understands this is currently being done by a number of large organisations in both the ICT sector and beyond.

Targets and quotas

The ACS recommends setting KPIs or targets at all management levels to deliver improved gender equality outcomes. The ACS favours targets as opposed to quotas for the reasons outlined in section 2.3.4.

Role models

The ACS recommends establishing an Ambassador-style program which involves successful women in ICT participating in a mix of advocacy and marketing activities aimed at inspiring females to pursue a career as an ICT professional. The campaign should also encourage women to "call out" discrimination and other obstacles which retard career progression. The ACS already promotes female role models through its membership and is keen to take a leadership role in establishing an Ambassador program more widely.

Mentors and sponsors

The ACS recommends employers give serious consideration to establishing mentoring or sponsor programs. When done well, they have proven to be an effective way of providing career support for female ICT practitioners. As noted in section 2.3.3, sponsor programs in particular are now generally regarded as the more effective of the two approaches. The ACS itself has considerable experience in running mentoring programs and is planning to enhance the breadth of its program over coming years, including the possibility of working closely with individual employers.

Females and the School Education System

Recommendation 3

The ACS recommends that the ICT industry and profession, educators, employers, government and career advisors work collaboratively to develop a strategy to effectively tackle the issues. Furthermore, the ACS is prepared to take a leadership role in facilitating this approach through its close collaboration with ICT educators nationally.

Recommendation 4

The ACS recommends that the strategy should, as a minimum, include the following elements:

- A program aimed at changing perceptions of what a career in the ICT profession can offer. This will involve providing female students with accurate and contemporary advice on the jobs of the future, the importance of ICT skills in this future, and the significant opportunities for rewarding and fulfilling careers for those with highly developed specialist ICT qualifications and skills. This program must involve the ICT profession and industry working closely with teachers, parents and, in particular, career advisory professionals. Importantly, it should also involve identifying and utilising appropriate female ICT role models;

- Stronger and more co-ordinated support for groups such as Code Club, Robogals, Go Girl, Go for IT and other groups which provide female students with access to computer coding experiences;

- Working with Governments to introduce a mandatory Digital Technologies curriculum as soon as possible, including providing assistance with a structured training and ongoing professional development program for ICT teachers; and

- A review of the pedagogy with a view to recommending changes which address the way maths, in particular, is presented and taught to female students.

Females and the Vocational and Higher Education Sectors

Recommendation 5

The ACS commits to work with the Australian Council of Deans of ICT (ACDICT) and relevant stakeholders in the tertiary sector to:

- Develop more effective ways of marketing ICT careers to potential vocational and tertiary education students;

- Establish stronger links between universities, the vocational sector and employers to help female students better understand where job opportunities exist; and

- Improve course content, structure and delivery to ensure that they encourage and support female participation and engagement.

"The ACS recommends organisations implement internal reviews to ensure that women performing roles similar to men, and at acceptable levels, automatically have their salaries adjusted to bring salaries to parity."

8 BREAKDOWN OF RECOMMENDATIONS

ATTACHMENT 2

RECOMMENDATION	AIMED AT:	ACS PARTNERS:	EQUALITY IMPROVEMENT	TARGET DATE
ACS: http://www.acs.org.au/				
Recommendation 1 Consult and collaborate with key partners and stakeholders to develop an agreed strategy for delivering better gender equality outcomes for ICT women professionals.	Employers, CEOs and senior managers, governments, education bodies and ACS members.	Employers and employer representative bodies (eg BCA, ACCI, AiG, AIIA), Governments, industry influencers, gender equity advocacy groups (eg WGEA, Male Champions of Change), individuals, professional bodies and educators and ACS Professional Partners.	Build momentum around gender equity in the ICT profession and develop a plan for engagement by convening a Summit.	Strategy in place by May 2016 with review of progress in November 2016
Recommendation 2 As part of Recommendation 1 above, a particular focus on initiatives to reduce barriers to increased female participation in the ICT workforce by changing our workplace cultures, structures and governance and addressing: leadership, culture and accountability; flexible work practices; gender pay equity; the use of role models; and mentoring and sponsorship.			Improve diversity and generate better business outcomes through the inclusion of more ICT women in corporate structures, management and ICT roles.	
Recommendation 2 (continued) Explore opportunities to work with Male Champions of Change and develop a program with a focus on ICT as a desirable, enabling and empowering career.			Empower women in the corporate and governance structure.	
Recommendation 2 (continued) Provide professional development opportunities for women to improve their effectiveness as negotiators, create better career paths and become leaders in their workplaces.	Female ICT professionals, their employers, employer representative bodies and professional associations.	The ACS through its Future Leaders and Young IT Leadership programs, ACS Professional Partners, employers, employer representative bodies, gender equity advocacy groups, individuals and governments.	More women in ICT with the professional skills required to achieve genuine equity outcomes in the workplace.	July 2016
Recommendation 3 Consult and collaborate with key partners and stakeholders to develop a strategy to encourage more female school students to pursue a career in ICT.	Schools, the teaching profession, teacher educators, career advisors and parents.	School representative and advocacy groups, career advisors and their professional body, curriculum designers, providers of extra curricula computing experiences (eg Code Club, Robogals etc), employers and employer groups, Digital Careers group and governments.	The school system generates a material increase in the number of female students wishing to pursue a career as an ICT professional.	Strategy in place by July 2016
Recommendation 4 As part Recommendation 3 above, develop an appropriate suite of programs for classroom teachers to skill them in delivering digital technologies.	Teachers and teacher educators.	Industry partners (eg Google, Microsoft, Cisco, etc), universities and ACDICT, governments, Digital Careers group, industry advocacy bodies and the ACS Foundation.	Empower the classroom in coding, computer science and computational thinking. Improve engagement amongst students.	Full program of work underway by July 2016
Recommendation 4 (continued) Develop a suite of targeted career promotion products that demonstrate how ICT skills can be an enabler across a range of careers.	Parents, teachers, career guidance counsellors and students.	Employers and employer groups, ICT industry partners, schools and education bodies, career advisors, Digital Careers, ACS members and ACS Foundation.	Female students understand that an ICT career is empowering and can be a rewarding lifetime vocation.	
Recommendation 5 Improve the effectiveness of marketing campaigns to promote ICT careers to potential vocational and tertiary education students.	Students, career advisors, parents, educators and other influencers.	Employers and employer groups, ICT industry partners, ACDICT, ACS members, tertiary education institutions and partners.	Female students understand that an ICT career is empowering and can be a rewarding lifetime vocation.	
Recommendation 5 (continued) Establish stronger links between universities, the vocational sector and employers to help female students better understand where job opportunities exist.			Stronger linkages, more dialogue and greater information flow between our tertiary education sector and employers.	
Recommendation 5 (continued) Develop course content, structure and delivery which better encourages and supports female participation.	ICT educators and education institutions and teachers.		Increase in ICT tertiary enrolments and completions.	December 2016

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