



**Australian  
Information  
Industry  
Association**

## **AIIA Submission to the Senate Inquiry into the Capacity of Public Universities to meet Australia's Higher Education Needs**

**July 2001**

The Australian Information Industry Association (AIIA) is the peak national body representing suppliers of information technology and communications goods and services. AIIA has over 370 member companies which generate combined revenues of more than \$40 billion, employ over 100,000 Australians, and have export earnings of over \$2 billion.

The Association believes that Australia requires a world class national university education system to ensure the Australian information and communications technologies (ICT) industry is internationally competitive.

In presenting this submission, the Association is principally representing the suppliers of ICT goods and services in the context as employers of ICT graduates. However, many companies and government agencies which are not ICT suppliers also employ ICT graduates.

The Association also complements its submission by appending a copy of its recently released study "Breaking the Skills Barrier: demonstrating the benefits of investment in ICT higher education in Australia".

We have outlined our key recommendations against the Terms of Reference:

**(a) The adequacy of current funding arrangements with respect to:**

Australian higher education institutions face capacity and capability constraints in providing the quantity, and in some instances, quality of graduates demanded by the ICT industry. These constraints principally relate to the public funding system to which universities are bound and to trends in the level of public funding.

**(a) i The capacity of universities to manage and serve increasing demand**

The expansion in ICT industry, both in Australia and across the globe, has fuelled a large increase in demand for skilled IT workers, both in terms of total numbers, and of various employment specialisations. The rapid growth of the industry has led to a shortage of skilled people to work in the ICT industry and users of the ICT industry's goods and services.

The most comprehensive and current examination of the demand for, and supply and shortfall of, IT&T people in Australia is the report "Market for Australian IT&T Skills 2000-2002" recently released by the IT Skills Hub.

The IT Skills Hub report estimates the demand for additional people to work in core IT&T occupations and supporting role would be 24,000 in 2001 and a further 27,500 in 2002. In examining the 2002 demand estimate, the report estimates that of the 27,500 additional demand for IT&T people 18,400 of those would be required to have a university degree or higher IT&T qualification.

Looking at the supply side, the IT Skills Hub report suggests that Australian universities will supply 7,899 (in 2001) and 9,143 (in 2002) university graduates who would be working in the IT&T industry.

The IT Skills Hub drew the conclusion that there will be a shortfall of between 7,000-8,000 university-level graduates or equivalent in 2002.

The Association's study "Breaking the Skills Barrier: demonstrating the benefits of investment in ICT higher education in Australia", which was completed before the IT Skills Hub report, more conservatively estimated the size of the shortfall to be in the order of 27 500 ICT graduates over five years, or 5,500 per year.

Accordingly, university completions in ICT courses continue to fall well short of industry demand. Over the past 10 years, completions in higher education in IT&T courses have grown at an annual rate of 12.6 per cent, but still only reached 8700 students in 1999 — well short of industry demand. Much of the growth has also been from international students, most of whom do not remain in Australia (either because they have not been permitted to stay or choose not to stay). Growth in completions by local students has been just over 9 per cent per annum (6000 students in 1999), but has averaged over 30 per cent per annum for overseas students.

Contributing to the shortfall of graduates is the existence of unmet student demand for places at Australian universities. The trend in demand for places in ICT university courses, measured by applications, has been growing at a faster rate than offers of places.

**Recommendation:**

An increase in the number of subsidised HECS university places in ICT will be required to overcome the ICT skills shortage of tertiary graduates.

**(a) ii Institutional autonomy and flexibility**

Current Commonwealth Government funding for higher education is in the order of \$5.7 billion. Institutions receive the majority of their funding in a single block operating grant from the commonwealth government, which is allocated according to 'the Relative Funding Model (RFM)'. The RFM attempts to link the level of funding to the costs incurred by each institution in the provision of higher education.

Tertiary studies in ICT are relatively new when compared to other well-established disciplines, with most universities still without a dedicated ICT faculty. This is changing and ICT is gaining increasing prominence within universities; being one of the highest growth areas in terms of student demand and university revenue generation. However, there is a general frustration among ICT faculties that ICT is not receiving the internal funding allocation it requires.

Transferring places from other faculties to ICT is not financially viable, partly because the funding ratio for ICT places under the RFM is too low to adequately cover the true cost of ICT student places.

**Recommendation:**

Tertiary funding model and allocation mechanisms need to be more market sensitive.

**(a) iii The quality and diversity of teaching and research**

The shortage of ICT teachers in universities is a barrier to increasing the supply of ICT graduates, particularly in the short term. The teacher shortage is attributable to several factors, not least of which are the income disparities between teachers and industry practitioners (partly related to limited practical teacher training), and the reduced quality of life of the academic as work loads and class sizes increase to unsustainable levels. This issue is also related with the level of funding for ICT courses. Universities are not funded at a sufficient level, for ICT students, in order to be able to pay the appropriate salary levels for teaching staff.

The shortage of ICT teaching staff inevitably affects the quality of teaching, be it as a result of higher staff work loads and stress, the lack of time available for keeping knowledge up to date, or just as a result of the limited size of the teaching pool. The effect on the quality of the teaching pool then adversely affects the capacity of ICT faculties to bid for research funding.

While it is important to maintain a high standard in the quality of academic staff, consideration must be given to making recruitment and promotion practices more flexible to accommodate potential entrants from private industry, and structured in a way that will attract them. Turning around the teacher shortage will be difficult, if not impossible without changes to salary determination and promotion protocols.

The Association considers the quality, relevance and currency of ICT teaching is determined partly by the quality of the teachers recruited into the ICT teaching staff, and partly by the continued professional development of the teaching staff. The Association believes that the areas of teacher recruitment and teacher professional development requires urgent attention.

The Association has noted the increasing 'casualisation' of university staff. The effects of this trend are not clear and the Association is not in the position to draw conclusions. But the Association does consider that the trend does need to be considered in its own right in terms of the quality of ICT teaching staff and the availability of people to be ICT teachers.

**Recommendation:**

Recruitment, promotion and remuneration practices must be more flexible to maintain a high standard in the quality of ICT academic teaching staff. Substantial government investment is necessary to underpin the quality of teaching and learning.

**(b) The effect of increasing reliance on private funding and market behaviour on the sector's ability to meet Australia's education, training and research needs, including its effect on:**

**(b) i The quality and diversity of education**

Experience across Australia and around the world shows that the strength of the links between ICT faculties and industry is an important component of improving the quality of university graduates as well as teaching staff. These links are important in terms of ensuring that the syllabus taught is up to date given that the bulk of technology research is undertaken by private industry, and that graduates are as 'employment ready' as possible having been exposed to the application of their teachings in the ICT sector.

Universities still need to maintain, if not increase the quality of qualifications and the rigor of their credential systems. Input from industry might assist here.

Graduates from ICT programs with some industry involvement are highly sought after by the market, and such programs reflect positively on those institutions able to offer them. However, the Association considers that the links between educators and industry can be improved.

The Association believes the benefits of industry involvement and contribution to Australian higher education institutions outweigh the perceived compromise of academic independence and excellence and commercialisation of research. It is a matter of universities and industry to establish the relationship which does not compromise academic independence and excellence. In fact the leading academic institutions in the US are characterised by the involvement of industry in pure and applied research as well as in the teaching areas of academic institutions.

One result will be better market signals (particularly if aggregated by government) will be provided by industry involvement and this will help government and universities adjust and improve the quantity and quality of graduates.

This may provide greater incentives for top graduate to continue their studies and research at the post graduate level and thereby substantively contribute intellectually and innovatively to encourage developments in ICT technologies within Australia.

***Recommendation:***

Universities should be encouraged to develop industry advisory boards and other links as one mechanism for improving the pace of curriculum development.

**(b) ii The production of sufficient numbers of appropriately-qualified graduates to meet industry demand**

At present there is little in the way of any mechanism to determine the level of internal funding for ICT faculties which will mean they are more responsive to market signals calling for an increase in ICT graduates. Universities are not required to respond to market signals in order to receive their operating and capital funding from the Commonwealth Government. A recent review of the Commonwealth funding framework for public universities was highly critical of

the block grant approach to funding, and the incentives that are, and are not, instilled onto the university system.

Under the present system, the allocation of resources within universities is independent from government. However, it is clearly strongly influenced by the model of federal funding. Moreover, governments do spend considerable amounts of public money on higher education, and therefore have a responsibility to ensure funds are allocated in a way that is consistent with broad community goals.

However, private funding may well be a good indicator of demand for graduates, and universities will benefit by producing more employable graduates in ICT. It is argued that private funding should supplement public funding allocation, which is seen to provide a more stable basis to meet perceived long term national needs.

**Recommendation:**

Tertiary funding model and allocation mechanisms need to be more market sensitive.

**(b) iii The adequacy of campus infrastructure and resources**

The level of government funding of universities today is largely based on the 1989 Relative Funding Model, which funded ICT places at a ratio of 1.6, compared to 1 for Arts places and 2.2 for Science and Engineering. In a recent study, more than half of the universities reported that they have reached physical capacity limits of existing buildings, computer laboratories and teaching space, acting as a barrier to increasing university places.

The ratio allocated to ICT is 'too low' and the level of funding for ICT faculties does not reflect the true cost of a students' education. This has led to a greater reliance on (and thereby encouragement of) international and postgraduate students, who are likely paying above the full cost of education.

**Recommendation:**

Increase Relative Funding Model ratio for ICT places.

**(b) iv & v The maintenance and extension of Australia's long-term capacity in both basic and applied research across the diversity of fields of knowledge and the operations and effect of universities' commercialised research and development structures**

Linkages between industrial and university research groups are especially important in ICT because of the need for constant innovation, and the potential for rapid commercialisation of the results of research. Other than the potential for commercial benefit, there are other very diverse benefits, ranging from improving research knowledge in industry, to giving insights into industry needs, to providing applied research experience for postgraduate students.

There are structural impediments that limit the extent of research collaboration between higher education and industry. Universities reward researchers on the basis of their published original research results. This means that there is a focus on open exchange of ideas, and a longer term focus, compared with a need for

commercial confidentiality and a time to market imperative that is especially important in a rapidly changing sector like ICT.

There are also resource constraints on collaboration. The university may not have sufficient research facilities or specialist staff to support joint projects. Australia is not producing enough top quality ICT graduates to meet current demands for research and development, much less any increase in activity. Many highly trained people are going abroad because of the lack of research funds. Australian universities are turning out an insufficient number of ICT PhDs to meet current industrial and academic needs. Another constraint is the lack of project funding for ICT research. It is inevitable that there will be strong competition between the research fields for such funding.

**Recommendation:**

Greater funding is needed and priority setting is needed for existing funds to be spent more effectively on ICT research.

The universities must do more to attract students to postgraduate studies, including higher level funding for postgraduate scholarships.

**(c) Public liability consequences of private, commercial activities of universities**

There is no reason why private funding should undermine universities achieving their roles as educators, their independence or academic standards. Australian and international universities have depended on private fees and complimentary contributions and have developed policies and protocols to ensure that they uphold their reputation as a source of independent inquiry and advice. The commercial activities of universities are essential to support the commercial development of university research and provide relevant student experience.

**Recommendation:**

The commercial activity of universities needs to be recognised as crucial to the development of an internationally competitive national education system and commercial activity between the ICT industry and universities should be encouraged.

**(d) The equality of opportunity to participate in higher education, including:**

**(d) i The levels of access among social groups under-represented in higher education**

The Association acknowledges that people in certain social groups are under represented in tertiary education for reasons such as family and prior education experiences as well as the cost and opportunity cost associated in undertaking tertiary study.

In particular, the industry remains concerned over the low participation of women in computing studies at universities. This is despite considerable efforts by many to promote ICT study and careers to young women. Similar issues are apparent in encouraging students in regional areas to consider ICT as a study and career option.

The Association believes these efforts must continue if Australia is to increase the pool of ICT professionals in the Australian community.

Nevertheless, the industry does not wish to have entry standards unnecessarily decreased. In fact, the industry is concerned that the UAI for ICT courses is low in comparison to other professional oriented courses.

**Recommendation:**

Interest of ICT in potential students, especially in regional areas and amongst women, must be raised so that any rise in undergraduate places translates into a more representative ICT graduates skills base.

**(d) ii The effects of the introduction of differential Higher Education Contribution Schemes and other fees and charges and changes in funding provision on the affordability and accessibility of higher education**

Universities were recently permitted to increase student places by 25 per cent for full-fee paying undergraduate places. The vast majority elected not to exercise this option on equity grounds. The experience of those that have is that quotas are difficult to reach given that, at a cost of \$12 500 a year without a loans scheme, demand is not significant. Potential graduates are not seeing expected wage differentials in ICT that are sufficient to cause them to make the investment. These factors combined suggest that an increase in the number of university places in ICT will require those places to be subsidised HECS places.

**Recommendation:**

An increase in the number of subsidised HECS university places in ICT will be required to overcome the ICT skills shortage of tertiary graduates.

**(d) iii The adequacy of current student income support measures, and**

For those looking to move into ICT, the inability to offset retraining costs through the tax system is a disincentive to moving into ICT. Retraining costs are not insignificant (\$8000 to \$41 000), but the rules for self-education expense deductions clearly state that expenses can only be claimed when they relate to current work activities.

**Recommendation:**

Taxation improvements are required to remove disincentives and introduce incentives to encourage more people to enter ICT tertiary education.

**(d) iv The growth rates in participation by level of course and field of study relative to comparable nations;**

The past decade has seen strong growth in tertiary participation rates in Australia and around the world. In Australia, the growth in enrolments in ICT has been even more dramatic, both in IT&T courses and IT&T units of study. Student enrolments in ICT courses has risen 8.5 per cent per annum over the past decade, and enrolments in IT&T units of study have risen almost 5 per cent each year over the period.

**(e) The factors affecting the ability of Australian public universities to attract and retain staff in the context of competitive local and global markets and the intellectual culture of universities;**

Rising demand for ICT professionals has led to an increase in salaries, which has drawn teaching resources out of the university, and tempted graduates (and those yet to graduate) into employment rather than further education. This has resulted in a lack of teaching resources, a lack of post graduate students, and less advanced academic research in the ICT field.

ICT faculties in Australian universities describe themselves as constantly in recruitment mode. Advertising two or three times for an academic position in ICT is not uncommon, nor is receiving no applications for an advertised position. However the staff shortage issue goes beyond the available pool of interested teachers. Anecdotal evidence suggests that the rigidity of recruitment and promotion practices within universities in particular is shrinking the size of that pool. It is certainly the case that, the higher the level of the position, the more difficult and slower it is to secure an appointment. This is at least partly due to the composition of selection panels, which become larger and more varied across faculties in line with the seniority of the appointment.

**Recommendation:**

Recruitment, promotion and remuneration practices must be more flexible to maintain a high standard in the quality of ICT academic teaching staff.

**(f) The capacity of public universities to contribute to economic growth: in communities and regions, as an export industry, and through research and development, both via the immediate economic contribution of universities and through sustaining national research capacity in the longer term;**

All industries benefit from growth and improvements in ICT, not least traditional industries. Scientific and technological developments have always been key drivers of economic performance around the world, and the ability to create, distribute information and exploit knowledge, is a source of competitive advantage. Australia's future as a knowledge-based economy will depend upon our ability to innovate – to generate new knowledge, ideas and technologies through research.

Universities are increasingly entrepreneurial, with many developing, or seeking to develop, outsourcing companies of their own that can generate funds for the university and provide work experience for students. Many of these initiatives have been established through links and funding by industry.

**Recommendation:**

Strengthen links with industry through ensuring effective taxation treatment of investment in research and development.



**(g) The regulation of the higher education sector in the global environment, including:**

**Accreditation regimes and quality assurance**

The Association considers that Australia must be able to compete internationally through a world class education and training system and that means insuring Australia has an accreditation system which is benchmarked against that of the US and other OECD countries.

The Association monitored the recent review of Australian universities' assessment systems and, while pleased with the result and notes the move to external audit, it does consider that a stronger system needs to be instituted within 12 months.

Australian universities are increasing delivering online education to overseas located students. This presents challenges in maintaining Australia's regulation of its higher education sector.

**Recommendation**

To be export competitive, we need to ensure our ICT education system is world class. We should be adopting best practices from world-wide sources, with industry being extensively consulted by government bodies.

**External mechanisms to undertake ongoing review of the capacity of the sector to meet Australia's education, training, research, social and economic needs**

The Association has no comment on this item.

**University governance reporting requirements, structures and practices**

The Association has no comment on this item.

**(h) The nature and sufficiency of independent advice to government on higher education matters, particularly having regard to the abolition of the National Board of Employment, Education and Training.**

The Association acknowledges that government has a number of avenues and sources of advice on higher education matters.

However as a general statement, the Association considers that government does not entertain sufficiently broad range of avenues and sources particularly in the new growth areas such as the ICT industry. Government consultation can be characterised as always consulting with the same group of people and organisations. The work of the Standing Ministerial Councils associated with education and employment is not communicated to industry.

Similar views apply to the avenues and sources of advice used by universities.

**Recommendation**

Governments and universities should consult a wider range of organisations and businesses.