

July 30, 2008

Secretariat
Review of Australian Higher education
GPO Box 9880
Canberra ACT 2601

Re: *Submission to the Review of Australian Higher Education, Discussion Paper, June 2008*

Dear Professor Bradley,

The Australian Council of Deans of Information and Communications Technology (ACDICT) welcome the opportunity to respond to the Review of the Australian Higher Education. We believe that this review is timely and represents an excellent opportunity for Australia to assess and reposition its higher education system to enhance its competitive advantage in the global environment.

Each member of the Australian Council of Deans of ICT has been officially endorsed by their respective Vice Chancellor as his or her senior nominee responsible for representing the various ICT educational offerings at each respective University. In other words, the council enjoys unanimous support across the entire Australian higher education sector as the peak body representing the following broad disciplines in no particular order:

Computer Science, Information Technology, Information Systems, Software Engineering, Telecommunications Engineering, Electronic Engineering, Computer Systems Engineering, Electrical Engineering, and other ICT related disciplines

The ICT Higher Education sector is facing a number of very serious challenges which together with the ever widening ICT skills shortage serves to compound and acerbate its position in terms of its ability to respond to change and ultimately remain viable as a robust provider of leading edge skilled professionals and innovators within a major sector of the national economy and our social fabric. We ask the review panel to consider our submission (predominately in reference to Section 3.1 of the discussion paper) and endorse our recommendations for positive change.

Yours sincerely



Professor Joe Chicharo
President of the Australian Council of Deans of Information and Communications Technology

Australian Higher Education Review: A submission from the Australian Council of Deans of Information and Communications Technology

Information and Communications Technology (ICT) – an overview

The core elements of the ICT higher education sector include the following disciplines:

- Computer Science
- Information Technology
- Information Systems
- Software Engineering
- Telecommunications Engineering
- Electronic Engineering
- Computer Systems Engineering
- Electrical Engineering and other
- Other related ICT disciplines

The very breadth of ICT, stretching across Engineering and manufacturing, Science and Economics, and contributing substantially to health and global business, illustrates both the scope and foundational role that ICT plays in our current and future knowledge society. Furthermore, ICT will play an increasing and vital role in addressing sustainability and climate change issues including its monitoring and management as we move forward.

ICT as the economy backbone

Australian universities have always been mindful of industry needs and recently a new era of university and industry partnership has begun with the establishment of an Australian Council of Deans of ICT (ACDICT) with every Australian university as a member. This Council will bring together this diverse sector to speak as one voice with industry and government to address the national crisis in supply of skilled ICT workers. A key partnership is with the Australian Information Industry Association (AIIA) which has provided the following information.

Computers, computing and communications play an important role in our daily lives as well as in every part of our economy. ICT is a vital input into banking, healthcare, telecommunications, education, transport, resource exploration, manufacturing, tourism, primary and mineral production, security, and now the sustainable environment.

Our industry delivers around 6% of Australia's total GDP. In fact, ICT makes a greater contribution to Australia's GDP than agriculture,

forestry, fishing, defence and education. ICT has delivered the major share of Australia's productivity growth over the last decade with our manufacturing sector gaining 85% productivity growth through its use of ICT.

With more than 100,000 new ICT jobs created in the past decade, approximately 385,000 workers are now employed in ICT occupations in Australia.

Skilled people are the most important component of the ICT industry as they provide the genesis, implementation, and support for the technologies delivered by the ICT industry. However, Australia is facing a widening gap between the demand for ICT skills and the supply of qualified ICT workers.

Industry demand for ICT graduates

Industry demand for skilled ICT workers has been increasing steadily over the years whilst high school and university enrolments in ICT have been declining dramatically. For example, from 2001 to 2007 the number of domestic enrolments in ICT courses dropped by 50%. Meanwhile, in the five years to June 2008, the ICT Vacancy Index (published by the Department of Education, Employment and Workplace Relations - DEEWR) rose by **237%** to 251.1% (January 2002 = 100). The number of ICT vacancies has more than tripled in this period to a weekly average of **around 23,200** in June 2008.

Industry reports confirm that employers are experiencing great difficulty in recruiting across a wide range of ICT skills. Employers are reporting large numbers of vacancies which cannot be filled by local or even overseas personnel. Unless this trend is reversed there will be serious consequences for the future well-being of Australia.

Falling enrolments

The decline in enrolments in ICT in high schools and universities is markedly affected by the perception in the community of the ICT profession and career prospects particularly those of parents, high school teachers and careers advisors. It is clear that the broad ICT education sector and industry must work together to address persistent erroneous perceptions of the profession and jobs. The falling enrolments have generally been across the board in terms of ICT disciplines. A major key concern is that the sector is also attracting a smaller component of the brightest and most talented students and the number of women taking up ICT, as well as other minority groups, has also decreased markedly.

Proactive support from Federal and State Governments is essential to address this crisis. Without a clear message from the government concerning the critical need for further skilled ICT graduates, all other efforts may be seen as furthering self interest rather than that of the national economy.

Student satisfaction and employment rates

There is ample evidence that the quality of ICT teaching in universities is at least satisfactory and that students are generally satisfied with their university experience. Graduate employment rates are high: 85% of ICT graduates in full-time employment in 2007 (83% for Computer Science and 87% for Electronic and Computing Engineering) because of the skills shortage. Clearly the industry demand is outstripping the supply in terms of quality graduates from our higher education sector.

There is no doubt that universities and industry have to cooperate at all levels to ensure not only a high quality education but also graduates who are industry ready. A major challenge being faced by the ICT Higher Education sector is rapid obsolescence of ICT laboratory infrastructure naturally arising from the fast pace of technology change. The present levels of funding do not account for the need to provide students with state of the art experience with the latest technology.

Staff dissatisfaction

While students may be generally satisfied there is considerable staff dissatisfaction in the higher education ICT sector. The lack of enrolments in ICT in high schools and the flow on to universities has resulted in loss of university staff and reduced capabilities. This in turn leads to further reduction in the ability to attract students.

Coupled with the rapid rate of change of technological advances, the demand for resources required for teaching students is ever increasing. Equipping laboratory classes with necessary up-to-date resources is increasingly difficult as capacity is reduced.

A serious concern is the real threat that many ICT departments/schools may not survive this downturn ironically at a time when industry demand for skilled graduates is increasing. Downsizing and even closures of academic ICT units is already taking place throughout the sector. This diminishing capacity to provide the necessary graduates, in quantity and quality, will become unrecoverable, or at best, remain inadequate for meeting present and future industry requirements.

There is also a clear reduction in the number of PhD students enrolling in ICT, which does not bode well for the future state of the nation's innovation workforce both in academia and industry. In other words, the ICT skills shortage is exacerbating the problem as increasing incentives (such as salary) come into play to attract ICT staff away from academic positions and into the industry sector.

Furthermore, the academic population is aging with little if any augmentation by new recruits to academia. While industry demand and remuneration is high, there is little incentive for students to pursue an academic career. The long term health of ICT academia requires incentives, in terms of funding and industry cooperation.

This negative spiral has resulted in the enrolment of less skilled students and the remaining academic staff having to do more with less funding resulting in increased workloads. In such a climate, a substantial proportion of academic staff find that they no longer have the time to keep up to date with technology change and that their skills are in danger of becoming less relevant. This in turn affects the quality and industry readiness of graduates.

Addressing the educational and enrolment shortcomings in ICT

There are three priorities requiring urgent attention:

- Learning and teaching facilities for ICT
- Incentives for student enrolments in ICT
- Incentives for greater industry contribution to education

Learning and teaching facilities

ICT is currently banded with education, architecture and mathematics. When the bands were set, computing was seen as most closely allied with mathematics, and that's why that level was chosen. Today it's widely understood that ICT is more similar to the experimental sciences and engineering in the way it's taught and in the costs of delivery, so it should be in the same band as engineering and science.

The higher level of funding would also facilitate work integrated learning in an effort to enhance the students' practical experience and job readiness. Wherever possible and relevant, the work integrated learning should also be available to academic staff to enable them to keep up to date with rapid technological advances and develop more industry-integrated curricula.

Incentives for student enrolments

An increase in incentive for students to study ICT could occur through a similar arrangement as currently provided for mathematics and science whereby the university stills get the full HECs but students when they graduate and work (including teaching) in the area get a 50% reduction in their HECS debt.

A Government announcement to this effect, coupled with statements on the fundamental importance of ICT to the nation, would reverse the negative perceptions of ICT as a career.

Reversing the decline in enrolments with appropriate incentives would help universities maintain or improve capacity for up to date learning and teaching.

Greater student numbers should also lead to an increase in graduates pursuing an academic career (particularly if supported by industry) which would help maintain academic staff numbers.

Incentives for industry contribution to education

Given the approach in many areas, including ICT, for work integrated (or practice integrated) learning it would help if companies could claim the costs of supervising/mentoring/arranging such placements as a tax deduction.

Likewise, the time spent working with academic staff to develop and update industry-integrated curricula could be tax deductible.

Source of information

Labour Supply and Skills Branch, Australian Government Department of Education, Employment and Workplace Relations

Further ICT workforce information can be found at the Australian Government's SkillsInfo website or www.skillsinfo.gov.au/skills/SkillsIssues/ICTSkills/

For further Information please contact:

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