



WHAT IS NEEDED  
TO MAKE AUSTRALIA  
A KNOWLEDGE-DRIVEN  
AND LEARNING-DRIVEN  
SOCIETY?

JUNE 2001

## A Position Paper prepared for the Business/Higher Education Round Table by a Task Force of its Members.

Written by **Professor Ian Reid**, Deputy Vice-Chancellor (Teaching and Learning), Curtin University of Technology

This paper has also benefited from comments by:

Mr Trevor Gorey, Partner, Gorey & Sinclair

Mr Richard Hein, Managing Director, P&O Australia Limited

Mr Richard Keith, Research Officer, Griffith University

Dr Gale MacLachlan, Honorary Research Associate, Macquarie University

Professor Millicent Poole, Vice-Chancellor, Edith Cowan University

Professor Malcolm Richmond, Graduate School of Business, Curtin University of Technology

Professor Alan Robson, Deputy Vice-Chancellor, University of WA

Professor Paul Rossiter, Deputy Vice-Chancellor (R&D), Curtin University of Technology

Professor Mike Wood, Executive Dean, Curtin Business School, Curtin University of Technology

### Business/Higher Education Round Table

A.C.N. 050 207 942

Shell House, 1 Spring Street

Melbourne Vic 3000

Ph: 61 3 9654 8824

Fax: 61 3 9654 8835

Email: bhert@ozemail.com.au

Website: www.bhert.com

# WHAT IS NEEDED TO MAKE AUSTRALIA A KNOWLEDGE-DRIVEN AND LEARNING-DRIVEN SOCIETY?

*B-HERT Position Paper*

## EXECUTIVE SUMMARY

**Purpose:** *This paper aims to identify major public policy challenges that stem from a proper understanding of the nature of knowledge and learning.*

**Scope:** *The question under consideration has two aspects:*

- *Are our prevailing notions about “knowledge” and “learning” adequate to the demands of contemporary society?*
- *Are our systems of education appropriately structured to maximise their potential social and economic benefits?*

While implementation of the following proposals would involve some targeted allocation of resources, most of them do not depend on a substantial overall increase in government funding for education. This is not to underrate the necessity for such an increase. The case for it has recently been put forward elsewhere (for example, AVCC 2000, Chubb 2000, Batterham 2000 and Miles 2000). Widely acknowledged as cogent, that set of arguments will not be reiterated here. There is no doubt that the cost pressures on Australian universities have resulted in a serious “brain drain”, a severe deterioration of staff/student ratios, and a struggle to maintain the infrastructure for scholarly information. Current levels of public investment in higher education are plainly inadequate for a country that wishes to have a significant role in the competitive global economy of the “knowledge age”.

The present paper assumes a recognition of that fact, but places its main emphasis on the fundamental importance for Australia’s future of reconceptualising the nature of knowledge, identifying its main social benefits, and eliciting from that reconsideration some practical options for education policy. The policy options outlined make no attempt to cover the field comprehensively. They are complementary to various existing and currently proposed initiatives (in relation to science education, for instance), and for the most part they involve making better use of human and financial resources already dispersed within the community.

**Policy Priorities:** *The following priorities are suggested for consideration:*

- *establishing, on the model of the government’s present literacy program, a national program for schools that focuses on information literacy;*
- *funding a national scheme for coordinating and training volunteer retirees as tutors in literacy and numeracy, including information literacy;*
- *commissioning an inquiry into the capacity of design education to contribute to the national innovation agenda;*
- *commissioning an inquiry into the languages capability needs of this country over the next 20 years, and the adequacy of existing policies to meet those needs;*
- *providing financial incentives for schools to give core status to LOTE programs and for teachers to acquire the expertise to conduct immersion classes;*
- *providing scholarships for students who undertake double degrees in a foreign language and a business/professional discipline, and for language majors to spend a semester of their study program overseas;*
- *commissioning a detailed proposal for a HECS-style system of income-contingent loans for VET students;*
- *commissioning a detailed proposal for enhancing the long-term vocational utility of VET programs by integrating liberal studies within them;*
- *commissioning an inquiry into the feasibility and desirability of a closer structural relationship between CSIRO divisions and national networks of university research centres;*
- *devising university management policies that enhance the interaction and integration of high-quality teaching and research activities;*
- *ensuring that the Commonwealth operating grant formula for universities contributes to strengthening the teaching/research nexus;*
- *establishing substantial numbers of selective high schools in order to provide proper opportunities for the intellectually gifted and recruit excellent staff by offering enhanced salary and career opportunities to those who teach there. ■*

# WHAT IS NEEDED TO MAKE AUSTRALIA A KNOWLEDGE-DRIVEN AND LEARNING-DRIVEN SOCIETY?

*B-HERT Position Paper*

## 1. THE NEED TO REMOVE CONFUSION BETWEEN INFORMATION, SKILLS AND KNOWLEDGE

Beyond such familiar slogans as “knowledge economy” and “learning society” there is a cluster of overlapping concepts that ought to be clarified as a basis for policy development.

Information, in itself, is merely an inert resource. Skills, in themselves, have merely an instrumental utility. But knowledge involves the skilled use of information within an active, purposeful process of selection and interpretation. The best learning occurs when these differences are well understood.

Of course the categories cannot be absolutely separate, and the relationships between them shift as information becomes more and more of a commodity and circulates in ways that depend on new skills. In a society that is all too ready to dismiss such matters as “academic” (meaning pedantic and precious), it is vital that across both public and private sectors the changing nature of knowledge should be vigorously discussed and the socio-economic consequences fully appreciated.

In a report published by DETYA, Johnston (1998) identifies five current issues concerning the nature and application of knowledge:

- Changes in the relationship between knowledge and wealth creation, as companies recognise that marketable knowledge is the ultimate organisational capability;
- The emergence of the “knowledge economy”, and consequent importance of “knowledge management” and “knowledge skills”;

- The impact of information technology on productivity through knowledge acquisition and management, independent of physical location;
- A new economics of knowledge in which business under-invests in science because its findings are not commodities, and expects government to do much of the investing on behalf of business;
- The nature and basis of reliable knowledge, as positivism gives way to an emphasis on the social contexts that determine what needs to be known.

Implicit in Johnston’s analysis of the current situation is an awareness that knowledge involves considerably more than the gathering of information or the exercise of skill. Confusion of knowledge, information and skill seems to have increased since electronic communication technologies began to dominate the way we do things.

The ease with which vast quantities of information can be gathered electronically is by no means an unmixed blessing. We have too much undifferentiated information and not enough knowledge about how to sift it and select what we need. “At a certain level of input the glut becomes a cloud of data smog that no longer adds to our quality of life but instead begins to cultivate stress, confusion, and even ignorance” (Shenk 1997). A recent study of US and Australian workforces by consultants Kepner-Tregoe (2000) has found that two in every three workers and three in every four managers believe that the number of decisions they are required to make in a typical working day has increased over the last three years. Most also say that the time they can spend on each decision has decreased. Sheer profusion

of information is seen as the major factor, and because much of it is computer-channeled there is an increase not only in speed of delivery but also in the expected speed of processing and response.

The internet is an indiscriminate medium. Hype about the Information Age seldom acknowledges that knowing how to manage information judiciously is more important than ever in an online environment. Much of the information conveyed through the internet is unreliable, since it can easily be posted on a website without the vetting and verifying procedures usually expected of printed sources.

Australia will not become a learning society by saturating itself uncritically with mere information. Its priority must be to become information-literate. There is a vital need for educational programs at all levels, and especially in universities, to equip students with the ability to locate, retrieve, decode, appraise, and apply information in a range of contexts and media (Candy et al. 1994). Along with the common failure to recognise that information literacy must underpin developing knowledge is a tendency to mistake the useful basic skills of computer literacy (comparable to being able simply to drive a car) for the tasks of managing information in a purposeful way (comparable to being able to use complex roadmaps for making clever choices that will lead to the desired destinations).

To insist on these distinctions is not to lessen the importance of information itself. Unless ample information is readily accessible, knowledge cannot develop in a way that confers rapid and widespread social benefits. Therefore the urgency of Australia’s need to develop a more secure and elaborate information infrastructure cannot be doubted. Improved technical architecture and service frameworks are necessary to maximise access to scholarly information. Learning for the Knowledge Society (2000), a set of action plans developed in consultation with all parts of the education and training sector, rightly emphasises the fundamental need for improved technical

infrastructure, including high bandwidth, to ensure affordable access to information. And a recent Strategic Directions paper prepared by the Coalition for Innovation in Scholarly Communication in partnership with the Australian Research Council recommends that a pilot program be established to create a distributed digital pre- and post-print repository of Australia’s research output (CISC 2000).

While such initiatives are indeed enormously important and must be pursued, the present paper argues that they are insufficient. Policy development needs to focus on knowledge rather than on information alone. It must recognise that people learn well only when they acquire the habit of asking astute questions and evaluating answers. Information technology is a great vehicle; it cannot be a great driver. Knowledge and learning should drive Australia into the future.

Knowledge has several forms, all of which require a critical focus if they are to lead to true learning. Knowledge about facts is just information; Lundvall & Johnson (1994) call it “know-what” as distinct from “know-why” (explanatory science), “know-who” (socially related understandings) and “know-how” (skill in managing practical processes).

Much public discussion of “skills” is sloppy. The term is sometimes used in an over-particular way to refer to workplace competencies (the ability to utilise a certain technological application, for instance), and sometimes in an over-general way to refer to certain mental aptitudes regardless of disciplinary context (as if problem-solving in a laboratory and problem-solving in a political situation were the same process). Information literacy comprises three macro-generic “skills”: acquiring information, evaluating information and using information. Therefore it is an essential element in the cognitive processes that shape information into knowledge.

It follows that government action ought to lift information literacy into greater prominence at

primary and secondary levels of the education system. Filling classrooms with computers is far less important than equipping teachers through professional development to manage information knowledgeably and help their students to do so as well. This should involve arrangements for ensuring that librarians, with their expertise in information literacy (including its rapidly growing electronic scope), contribute more substantially to the learning development of staff and students.

#### RECOMMENDATION 1:

That the government establish a national program for schools, on the model of its literacy program, that focuses explicitly on information literacy.

There is a further line of action available in the light of demographic trends that indicate an under-appreciated resource and opportunity. As a larger proportion of its population becomes greyer, Australia should be utilising a neglected reservoir of expertise within the community. In particular, it can devise a systematic way of tapping the knowledge possessed by large numbers of increasingly well educated early retirees who are capable of providing voluntary mentoring for ancillary literacy programs to all age groups. Such programs can do much to spread inclusively the attitudes that create a passion for learning in the society at large.

Mentoring is pedagogically effective and can operate with great efficiency. The intellectual resource is there, potentially, in a growing volunteer sector of the community, but it needs to be organised. A national study of ways of enhancing participation in adult literacy programs recommended (*inter alia*) “that Commonwealth and state systems commit themselves to funding practices which facilitate long-term planning in adult literacy provision”

(McLain, Reid & Macaulay 1993, p. 141). This commitment can best be given substance through the TAFE system, in the form of targeted long-term resources that equip it to carry out a sustained vetting, training, coordinating and evaluating role on the model of Western Australia’s successful Read/Write Now mentoring scheme. Universities, in partnership with TAFE, can also make an important contribution to training the trainers.

#### RECOMMENDATION 2:

That the government fund a national scheme for coordinating and training volunteer retirees as tutors in literacy and numeracy, including information literacy.

## 2. THE NEED TO REMOVE CONFUSION BETWEEN NEW IDEAS AND TRUE INNOVATION

Global commerce has created what Castells (1996 p. 32) characterises as “a cumulative feedback loop between innovation and the uses of innovation”, with knowledge being applied increasingly to the generation of further knowledge. The fact that much of this is focused on skill-intensive information-processing devices and systems carries a risk of overlooking what is necessary for the most productive kinds of innovation.

If a society is to become truly learning-driven, it will need to understand that powerful knowledge, while drawing constantly on information and issuing in the exercise of practical skills, also relies on creative thinking. This means more than generating new thoughts; it means testing and applying them as well, and doing so through collaborative effort. Bright ideas may often occur to individuals, but innovative processes depend on the capacity of a community of learning to put ideas to work and rigorously evaluate them.

Innovation also depends on developing within that community a stronger culture of research commercialisation, so that knowledge and creativity will be converted into economic activity. The importance of the creative element for value-added knowledge production is not always fully appreciated.

Statistics on patent registration indicate a worrying trend. Patents are fundamental in a knowledge economy, and yet this country is clearly falling behind. Twenty years ago Australian inventors had far more patents in the market than their counterparts in (for example) Israel and Taiwan, but now they have fewer; in fact patented Taiwanese inventions currently outnumber Australian four to one, stretching across a range of fields from electronic applications to the design of textiles and apparel, and shifting towards business methods and processes (Gettler 2000 p.17).

In the final report of the Innovation Summit Implementation Group, Innovation: Unlocking the Future, Miles et al. (2000) argue the case for full-cost funding of research in order to ensure that the nation’s innovation infrastructure is developed. Batterham (2000) echoes the theme. While those funding measures are critically important, action must also be taken on another front. Both the reports just cited tend to conceive of research activity in isolation from institutional contexts and therefore to overlook its nexus with teaching and learning. Within those institutional contexts there are particular ways in which the scholarship of discovery can and should connect well with the other forms of scholarship that Boyer (1990) has identified: the scholarship of application, the scholarship of integration and the scholarship of teaching. Some fields of study have a special interconnective value for a society that is serious about learning how to use its knowledge more productively. Science and engineering are rightly highlighted by Batterham as vital for this country’s intellectual and economic growth, but

because of their focus on already-identified problems they do not always ensure a connection with productive creativity, which is the domain of design.

Australia needs to give greater prominence to the role of design in stimulating innovative applications of ideas. Although an understanding of the relationship between design and knowledge is indispensable for the kind of learning that leads to innovation, our curriculum structures and teaching practices seldom foster it. Edward De Bono writes eloquently about the difference, especially as far as business development is concerned, between problem-solving and productive thinking; the latter, he argues, has more to do with creativity, imagination and speculative design than with solutions to existing problems (De Bono 1992).

The requirements of employers match this priority. A recent survey of Australian employers’ views of graduates revealed that, across all industries, “creativity” is the most highly valued attribute of all (Nielsen 2000, pp. 14-15). Mere computer skills, in comparison, are rated low in importance.

Some universities offer programs in design but many do not, and even where it is available its scope as a field of study does not always give due emphasis to creative aspects of product design and other such market-oriented applications of knowledge. Design therefore tends not to receive serious system-wide recognition at present within the university sector, and yet its potential scope may well be considerable. A commissioned inquiry into the capacity of design education to contribute to the national innovation agenda would be timely. Part of the point of this investigation would be to determine whether the way forward involves a rethinking of the present range of programs in design as a distinct curriculum area, or an integration of design within professional programs in fields such as commerce, engineering and biotechnology – or both.

### RECOMMENDATION 3:

That the government commission an inquiry into the capacity of design education to contribute to the national innovation agenda.

### 3. THE NEED TO REMOVE BARRIERS TO RECOGNISING THE IMPORTANCE OF CULTURAL KNOWLEDGE FOR BUSINESS DEVELOPMENT

Australia's geographical isolation is a natural impediment to certain kinds of knowledge that are widespread in most societies. Yet we make relatively little effort as a nation to remedy our consequent ignorance about other cultures. Though Asian countries offer enormous opportunities for Australian business to participate in their economic growth, they remain linguistically and therefore culturally alien to the experience of most Australians. And though Europe is the world's largest trading block of developed countries, its domestic languages are also opaque to many from our part of the world. It is often assumed, somewhat arrogantly, that the widespread international use of English as a lingua franca removes the need for us to be proficient in using the mother tongue of our prospective trading partners. As Stanley et al. (1990) have observed, this assumption disregards the practical importance of such things as negotiating styles and processes, the significance of the language medium in dealing with product complexity at the point of sale and in subsequent service transactions, the integration of business activities and societal conventions, the gathering of market intelligence and access to specialised publications – to say nothing of the intrinsic cognitive value of learning a foreign language. A complacently monolingual nation cannot become a well informed participant in international commerce and industry.

In a world where some forty sovereign states have at least two official languages and where multilingual facility has become the norm in most countries, Australia's lack of a comprehensive policy on language education is a serious national disability. We need to follow the example of other predominantly English-speaking countries that have identified a similar problem in their own education system and resolved to address it. Of particular relevance is the final report of the Nuffield Languages Inquiry (2000), whose members were drawn equally from business and education in the UK. If this matter is as grave for Britain as the Nuffield Report indicates, it is likely to be much graver in Australia. An independent inquiry is needed to gauge the scale of the challenge.

### RECOMMENDATION 4:

That the government commission Language Australia to undertake an inquiry into the languages capability needs of this country over the next 20 years, and to assess the adequacy of existing policies to meet those needs.

Meanwhile we cannot afford to sit on our hands. Some basic steps should be taken without delay. It is manifestly clear, for instance, that there ought to be much greater emphasis within our education system on the value of foreign language acquisition from the early years onwards. Compared with their Asian and European counterparts, where very young children are expected to begin learning thoroughly at least one language in addition to their mother tongue, most Australian schools are tardy and half-hearted in the way they introduce languages other than English. Rectifying this would lay a strong foundation for developing more advanced linguistic knowledge in secondary school and beyond.

Accordingly the government has a clear duty to provide a strong financial stimulus to the growth of languages other than English (LOTE) in schools. This in turn will have a positive indirect influence on the teaching and learning of languages in universities.

### RECOMMENDATION 5:

That the government provide funding supplementation incentives to those schools in which LOTE programs are given core status, and special award payments to those teachers who have sufficient expertise in both a LOTE and another discipline to be able to conduct "immersion" classes.

In the late 1980s the Australian Institute of Management sponsored a national research study to identify the main requirements for this country's managers operating in a global environment. One of the findings was that Australian managers generally complained of a basic lack of "atlas orientation" and associated cross-cultural awareness on the part of Australian students. Ironically, the point is confirmed by another finding of the same report: those managers themselves tended to have "an inflated opinion of their own relative competence" in comparison with that of managers from other cultures, and an insular "belief that the world accepts our cultural and special values" as normative (Miller & Leptos 1987, pp. 92, 99-100).

Compared with almost all Asian and European trading nations, Australia is impoverished in its cross-cultural knowledge resources. Our education systems give only marginal attention to foreign language learning. This restricts opportunities for Australian business development and disadvantages young Australians in the global recruitment market. For example South Korea is already one of Australia's most significant trading

partners, and yet this relationship is mainly confined to our export of mineral resources. Numerous other areas of commercial activity remain untapped because only a handful of Australians have any knowledge of Korean language and culture. That example can stand for a larger incapacity.

The teaching of foreign languages is declining in Australian schools at a time when nuanced cross-cultural communication is more important for this country's international business development than ever before. The development of LOTE skills to useful levels of proficiency is not being promoted successfully as complementary to the acquisition of other vocational skills. This is part of a downward spiral in language studies across all levels of the education sector. The fact that university language programs are unable to attract viable enrolments is both a consequence and a contributing cause of the low numbers in primary and secondary courses. Lacking financial incentives, few higher education students currently combine language with business/professional studies. A targeted scholarship scheme would ameliorate this situation significantly. A further valuable form of encouragement would be the introduction of a study abroad support scheme whereby those majoring in a foreign language would be financially assisted to spend at least one semester studying or working in a country where their target language is spoken.

### RECOMMENDATION 6:

That the government provide special scholarships for students who undertake double degrees in a foreign language and a business/professional discipline, and also to enable those majoring in a foreign language to spend a semester of their study program in an appropriate country overseas .

#### 4. THE NEED TO REMOVE STRUCTURAL AND FUNDING IMPEDIMENTS TO AN EFFECTIVE COMPLEMENTARITY BETWEEN THE TWO PUBLIC SECTORS OF POST-SECONDARY EDUCATION

The West Report (1997) noted that VET diploma students generally pay up-front annual tuition fees in the range of \$500 to \$700 for courses that cost about \$6,000 to \$10,000 per annum. That is, such students pay only a very small fraction of their actual course costs. By comparison, university students are contributing from 30% to 80% of their course costs through the HECS scheme.

Yet VET fee arrangements are at the same time a deterrent: Doughney et al. (2000) observe that many potential students are discouraged from participation in TAFE programs by the fact that the system requires up-front payment of fees. The same researchers have found that differences in fee structures between the two sectors (compounded by different curriculum and assessment structures) also produce financial anomalies and inefficiencies; for instance, those students who complete a TAFE diploma and then gain advanced standing on that basis towards an undergraduate degree are usually undertaking four years of study to achieve the same qualification that a university student achieves in three. In their report, Doughney et al. argue that dual-sector programs remain under-developed because of disparate funding regimes. While universities are funded on a triennial basis linked to EFTSU, an arrangement that permits reasonable flexibility in shifting load, on the other hand TAFE colleges have limited room to manoeuvre because they are funded on an annual contact-hour basis.

A HECS-style system of income-contingent loans for VET students would help to rectify those problems; it would be equitable vis-à-vis the university system; it would provide a more secure source of funding for the VET sector; and

despite some administrative problems, it is entirely feasible.

##### RECOMMENDATION 7:

That MCEETYA commission a detailed proposal for a HECS-style system of income-contingent loans for VET students.

Reducing funding differences between the two public sectors of tertiary education is a precondition for developing a true structural complementarity, but not a guarantee that it will happen. This development cannot occur, of course, without an accompanying scrutiny of habitual views about the kind of preparation students should have for vocational outcomes:

Although it is meaningful and often important to distinguish education from training, it does not follow that there need be an adversative relationship between liberal education and vocational education... The common equation of vocational education with mere job training is inadequate, because it does not recognise the variability and changeability of occupations. We need to be educated in a way that is both liberal and vocational if we are to participate fully in our social world. (Reid 1996, p. 132)

The foundations of this more inclusive view of the purposes and scope of education for work are already present in nineteenth-century liberal thought. Friedrich List's *The National System of Political Economy* (first published in Germany in 1841) offers a more useful model than Adam Smith's classical work *The Wealth of Nations* (first published 1759) for understanding the true potential of vocational education. "In the Smithian model there is short-term skill training on the one hand and high-level scientific and technical education on the other, together with a small amount of liberal education for a leisured class and the ruling elite and a more basic education for the rest." List, in contrast, envisages

a kind of vocational education that is central to society and has strong liberal overtones. Achieving this through a transformed VET system "cannot be a simple matter of a technical recipe to aid economic growth, but touches on the heart of what any society is about" (Winch 1998, p. 377). There is a strong link here to another B-HERT position paper, *The Critical Importance of Lifelong Learning*, which observes that "changing forms of paid employment and changes in skills and competencies required to perform in it" will necessitate educational responses that are not "conceived in a narrow vocational way" (B-HERT 2001, p. 7). Within the VET sector itself there is now an explicit acknowledgement of the need for programs to engage more effectively with "the demand for new skills other than job competency, including communication skills, ability to work with others, problem solving etc." (Smith 2001).

Making Australia, then, a truly knowledge-driven and learning-driven society must mean that information literacy, critical thinking and civics – the necessary foundational elements of liberal studies with contemporary relevance – are included in the curriculum of all vocational programs within the VET system.

##### RECOMMENDATION 8:

That MCEETYA commission a detailed proposal for enhancing the long-term vocational utility of VET programs by integrating liberal studies within them.

#### 5. THE NEED TO REMOVE STRUCTURAL IMPEDIMENTS TO AN EFFECTIVE CONSOLIDATION OF RESEARCH AND DEVELOPMENT EXPERTISE AND EQUIPMENT

It is obvious that, despite some useful initiatives in recent years, our national mechanisms for enhancing and utilising innovation through research and development remain fragmented and dispersed.

Johnston (1998) concludes his study of the changing nature and forms of knowledge by remarking on "the relative weakness of the knowledge-intensive industries in Australia" and the urgent need to develop "Australian teams of sufficient scale" that can build strong knowledge relationships with key players overseas. He observes that "centres of specialist knowledge production, with a scale appropriate to compete in the global knowledge economy, are essential", as is "the linkage of these centres into the milieu of knowledge application".

Instead of trying to address this problem by moving research funding into a small number of universities, which would have dire consequences in relation to section 6 below, the government might consider the feasibility of facilitating a closer structural relationship between CSIRO divisions and national networks of university research centres in relevant fields of inquiry. While the existing CRC scheme continues to achieve valuable synergies in selected areas, it does not ensure an optimal engagement of the higher education system with CSIRO as a whole. It is timely to ask whether there is scope for greater consolidation of expertise and equipment in order to stimulate and support innovation more effectively. The completely separate status of CSIRO vis-à-vis universities made good sense in different historical circumstances and has served the country well

in many respects, but the government may wish to consider building on the success of the CRC scheme by bringing the two kinds of organisation closer together in the future. This would be entirely in keeping with views expressed publicly by the new chief executive of CSIRO, who reportedly describes CSIRO as needing to become a more responsive “knowledge-based service organisation” by forming “more partnerships with universities” (Brook 2001).

#### RECOMMENDATION 9:

That DISR and DETYA jointly commission an inquiry into the feasibility and desirability of a closer structural relationship between CSIRO divisions and national networks of university research centres.

### 6. THE NEED TO REMOVE IMPEDIMENTS TO A STRONG NEXUS BETWEEN TEACHING AND RESEARCH IN UNIVERSITIES

Zubrick et al. (2001) remark that there is widespread concern about a perceived disjunction between teaching and research in Australian universities. For example, late in 1999 the Australian Vice-Chancellors Committee lent its public support to a policy document Australian Science: an investment for the 21st century issued by the Federation of Australian Scientific and Technological Societies which includes a call to “fund universities so they can advance knowledge through research, enthuse students through teaching, and ensure that discovered knowledge is transmitted from generation to generation” (FASTS 1999, p.16). The FASTS report takes it as axiomatic that “the nexus between research and teaching must be preserved”. It notes that “University staff need

time for scholarship, research and teaching. If our young people are to be enthusiastic about scientific knowledge and its application they must be taught by people who are actively involved in the practice of science” (p.15). Such a claim might be made for other fields of study as well.

However, some current funding policies and management practices are tending to attenuate this concept of multi-faceted scholarship that should underpin and inter-link both core academic activities. As the pace of change in higher education accelerates, “teaching” and “research” have each become more problematic and their relationship has become more difficult. In their recent study Academic work in the twenty-first century, Coaldrake and Stedman (1999) remark that “in practice the teaching and research expectations of academic staff are often narrowly defined and considered as separate entities” (p. 17). This does not inhibit the authors themselves from defining research in simple terms as “the generation of new knowledge” and teaching as “the transmission of knowledge” – formulations that some would regard as unduly narrow and separate.

A recent paper prepared by the HEC Group (2000) for the Higher Education Funding Council for England considers the extent to which universities in the UK have introduced imaginative policies to encourage a creative interaction between research and teaching. They report being “disappointed to find a general absence of strategic activity in this area”, with “the majority of universities ... still struggling to address well known problems that have been identified for at least the last decade, for example, ongoing problems of ensuring that staff appraisal schemes worked in practice, and how to manage non-active research staff who were also less than effective as teachers” (p. 12). Although Zubrick et al. (2001) indicate that some Australian universities have taken exemplary steps towards

a solution of these problems, one cannot assume that institutional policies and practices are uniformly satisfactory across the whole national system.

#### RECOMMENDATION 10:

That senior university officers ensure that their institutional policies (for instance with regard to appointment, appraisal and promotion) enhance the interaction and integration of high-quality teaching and research activities

Yet this is not simply a matter for university management to address. Tighter government control over university funding has contributed to the disjunction between the two core academic activities through mechanisms that tend more and more to treat them as discrete. The AVCC has recently observed that present funding arrangements simply do not provide adequate resources “for basic research and teaching infrastructure” (AVCC 2000, p. 17). Both parts of the scholarly enterprise need to be supported together. Within the government’s administration of the higher education grants system there is a need for resource distribution to be flexible enough and ample enough to ensure that the nexus between teaching and research is properly acknowledged and materially encouraged.

#### RECOMMENDATION 11:

That DETYA ensure that its funding formula for universities contributes to a strengthening of the nexus between teaching and research.

### 7. THE NEED TO REMOVE DISINCENTIVES THAT DETER HIGH-QUALITY GRADUATES FROM ENTERING THE SCHOOL-TEACHING PROFESSION

If primary and secondary schooling is to be truly knowledge-driven and learning-driven, the Teacher Education faculties of our universities must be strong enough to attract excellent students and to provide them with exemplary research-based teaching that will equip them well for their future work in schools. Conversely, what can be done within the tertiary education system will depend in part on the preparation that students receive in their primary and secondary schooling. A society that respects learning and pursues it keenly is one that has an intellectually vigorous schooling system in which an informed passion for discovery is fostered by top-rate teachers, especially in core curriculum areas such as science.

The Commonwealth government’s insistence on boosting basic literacy and numeracy levels is acknowledged as a valuable foundation. Complementary policy development, however, is important in order to meet the needs of students at the upper end of the capability continuum as well.

There is a need to establish substantial numbers of selective high schools that would provide proper opportunities for the intellectually gifted, and recruit excellent staff by offering enhanced salary and career opportunities to those who teach there. As the Minister has recently observed, a major factor undermining the attraction of teaching as a profession is “the inability under current industrial awards to adequately reward outstanding teaching” (Kemp 2000, p. 17).

This can be partly achieved through an expanded system of selective high schools,

linked to special employment incentives – provided that such a system facilitates access to educational opportunity for all students who can demonstrate aptitude and does not reinforce patterns of privilege and disadvantage. The schools would excel in the innovative and discriminating use of the new technologies to make the learning environment exciting and enterprising, with a strong focus on advanced forms of information literacy. An adequate scholarship scheme would counter any undue tendency to reproduce social stratification through selective high schools.

#### RECOMMENDATION 12:

That substantial numbers of selective high schools and associated scholarships be established in order to provide proper opportunities for the intellectually gifted, and that enhanced salary and career opportunities be provided to those who teach there so that excellent staff are recruited.

## REFERENCES

- AVCC (2000), *Our Universities: Our Future*. Canberra: AVCC.
- B-HERT (2001), *The Critical Importance of Lifelong Learning* (position paper no. 4). Melbourne: B-HERT.
- Boyer, E. (1990), *Scholarship Reconsidered: Priorities for the Professoriate*. Princeton: Carnegie Foundation for the Advancement of Teaching.
- Brook, S. (2001), “CSIRO Goes Private to Boost Income”, *The Australian*, 15 May.
- Candy, P., Crebert, G., & O’Leary, J. (1994), *Developing Lifelong Learners through Undergraduate Education*. Canberra: NBEET.
- Castells, M. (1996), *The Rise of the Network Society*. Oxford: Blackwell.
- Chubb, I. (2000), “Responsibilities and Potential for the Civilised Society: Australian Higher Education in the Coming Century”, *The Australian Higher Education Supplement*, 16 February.
- CISC (2000), “Australia’s Information Future: Securing the Infrastructure for Research and Innovation” (unpublished paper summarising outcomes of a seminar held by the Coalition for Innovation in Scholarly Communication, the National Academies Forum and the Australian Research Council, Canberra, 16 August).
- Coaldrake, P., & Stedman, L. (1999), *Academic Work in the Twenty-first Century*. Canberra: DETYA.
- De Bono, E. (1992), *Serious Creativity*. London: Harper Collins.
- DETYA (2000), *Learning for the Knowledge Society: An Education and Training Plan for the Information Economy*. Canberra: DETYA.
- Doughney, L., Watson, L., & Chapman, B. (2000), *Bridging the Divide: Developing the institutional structures that most effectively deliver cross-sectoral education and training*. Melbourne: NCVER.
- FASTS (1999), *Australian Science: An investment for the 21st century*. Canberra: FASTS.
- Gettler, L. (2000), “The Innovation Conundrum”, *Management Today*, October, pp. 14-19.
- Higher Education Consultancy Group (2000), *The Interactions Between Research and Teaching*, report for the Higher Education Funding Council for England (Annex A, Institutional policy and practice).
- Johnston, R. (1998), *The Changing Nature of Knowledge: A Review (EIP report)*. Canberra: DETYA.
- Kemp, D. (2000). “Building Up Government Schools”, *Unicorn: Journal of the Australian College of Education*, 26.2, pp. 13-17.
- Kepner-Tregoe (2000), *Decision-making in the Digital Age* (cited in *Management Today*, September, p. 18).
- Lundvall, B., & Johnson, B. (1994), “The Learning Economy”, *Journal of Industry Studies*, vol. 1, pp. 23-42.
- McLain, L., Reid, I., & Macaulay, C. (1993), *Enhancing Participation in Adult Literacy Programs*. Canberra: ALLP report for DEET.
- Miles, D. (2000), *Innovation: Unlocking the Future*. Canberra: ISIG final report.
- Miller, J., & Leptos, C. (1987), *Australia and the World: The Management Challenge*. St Kilda: AIM.
- Nielsen, A.C. (2000), *Employer Satisfaction with Graduate Skills* (EIP report). Canberra: DETYA.
- Nuffield (2000), *Languages: The Next Generation. Final Report and Recommendations of the Nuffield Languages Inquiry*. London: Nuffield Foundation.
- Reid, I. (1996), *Higher Education or Education for Hire? Language and Values in Australian Universities*. Rockhampton: Central Queensland University Press.
- Savery, L., Dawkins, P., & Mazzarol, T. (1995), “Customers’ Views of Australian Management: Asian-Pacific Viewpoints”, in Karpin, D., ed., *Enterprising Nation: Renewing Australia’s Managers to Meet the Challenges of the Asia-Pacific Century*. Canberra: AGPS.
- Shenk, D. (1997), *Data Smog: Surviving the Info Glut*. San Francisco: Harper Edge.
- Smith, A. (2001), “Times are a Changing”, *Campus Review*, 23-29 May, p. 8.
- Stanley, J., Ingram, D., & Chittick, G. (1990), *The Relationship between International Trade and Linguistic Competence*. Canberra: AGPS for DEET.
- West, R. (1997), *Learning for Life: Review of Higher Education Financing and Policy*. Canberra: DETYA.
- Winch, C. (1998), “Two Rival Conceptions of Vocational Education: Adam Smith and Friedrich List”, *Oxford Review of Education*, 24.3, pp. 365-378.
- Zubrick, A., Reid, I., & Rossiter, P. (2001), *Strengthening the Nexus between Teaching and Research* (forthcoming EIP project report). Canberra: DETYA.

## MEMBERS OF THE BOARD

Dr Mark Toner (Chairman)  
Company Director

Professor Tony Blake, AM  
Vice-Chancellor  
University of Technology, Sydney

Professor Denise Bradley, AO  
Vice-Chancellor  
The University of South Australia

Professor Gavin Brown  
Vice-Chancellor  
The University of Sydney

Mr Russell Cooper  
Managing Director  
South East Water Limited

Mr Richard Hein  
Managing Director  
P&O Australia Limited

Professor Michael Osborne  
Vice-Chancellor  
La Trobe University

Professor Janice Reid, AM  
Vice-Chancellor  
University of Western Sydney

Mr Rob Stewart  
Company Director

Professor Iain Wallace  
Vice-Chancellor  
Swinburne University of Technology

Professor Roy Webb  
Vice-Chancellor  
Griffith University

Dr Roland Williams, CBE  
Company Director

---

*Executive Director:*

Professor Ashley Goldsworthy, AO OBE FTSE FCIE

*Executive Assistant:* Anne Munday

## MISSION STATEMENT

The purpose of the Business/Higher Education Round Table (B-HERT) is to pursue initiatives that will advance the goals and improve the performance of both business and higher education for the benefit of Australian society.

It is a forum where leaders of Australia's business, research and academic communities can examine important issues of mutual interest, to improve the interaction between Australian business and higher education institutions, and to guide the future directions of higher education.

In pursuing this mission B-HERT aims to influence public opinion and both government and non-government policy on selected issues of importance.

B-HERT believes that a prerequisite for a more prosperous and equitable society in Australia is a more highly-educated community. In material terms it fosters economic growth and improved living standards – through improved productivity and competitiveness with other countries. In terms of equity, individual Australians should have the opportunity to realise their full social, cultural, political and economic potential.

---

The membership of B-HERT comprises, by invitation, the chief executives of major Australian corporations and research organisations, and the vice-chancellors of Australian universities.

B-HERT pursues a number of activities through its Working Groups, State Chapters and active alliances with relevant organisations both domestically and internationally. It publishes a regular newsletter (B-HERT NEWS), reporting on its activities and current issues of concern relevant to its Mission.

---

Further copies of this paper can be obtained at a cost of \$7.70 per copy (GST incl.) by contacting the B-HERT Secretariat by Phone: 61 3 9654 8824 Fax: 61 3 9654 8835 or e-mail: [bhert@ozemail.com.au](mailto:bhert@ozemail.com.au)