

**Comments provided to the Review of Higher Education
Financing and Policy on 'Learning for Life', a policy
discussion paper.**

Department of Industry, Science and Tourism

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Introduction

The Department of Industry, Science and Tourism (DIST) is committed to actively promoting the establishment of a competitive national business environment and improving the efficiency of business inputs to underpin the competitiveness of business activity. Education and training are fundamental inputs to business activity. In its recently released statement on industry policy, 'Investing for Growth', the government highlighted the importance of a high quality education and training system as a source of competitive advantage for industry (Commonwealth Government, 1997, p21).

DIST also has the goal of maximising the national benefits of research and innovation. DIST seeks to ensure that expenditure on public sector research is efficiently managed, effective and well focussed; the diffusion of technology is encouraged; there are close links between business and public research and technology bodies; Australia has an appropriate supply of scientifically trained and technically skilled people; and industrial property legislation protects new ideas, designs and products.

The Department therefore has a major interest in three aspects of the development of the higher education sector examined in the Discussion Paper.

- The efficiency of the sector in providing high quality labour inputs which meet the needs of industry.
- The development of the sector as an efficient and competitive industry in its own right.
- The need for high quality research which will enhance the technological and innovative capacity of the economy and which can be used to further the international competitiveness of Australian industry.

The Department supports the thrust of the Discussion Paper that national welfare will be maximised if competition in the sector is maximised and broadly supports moves suggested in the Discussion Paper for greater competition in the higher education system. It also supports moves towards greater competition, diversity and flexibility in the funding of research. Consequently, DIST does not agree with the suggestion that national priorities for research funding be set.

Reflecting the areas of interest of DIST, this paper is set out as follows. Section 2 outlines some pressures for change in the education system that did not receive much prominence in the Discussion Paper and which relate to the changing structure of the Australian economy and the increasing involvement by industry in R&D activities. Section 3 outlines DIST's view on ways of improving the efficiency of the higher education sector in providing high quality labour inputs to industry. Section 4 provides some suggestions on what could be done to assist the sector develop as an efficient and competitive industry in its own right. Section 5 outlines concerns about the suggestions in the Discussion Paper on how research funding should be handled. Section 6 contains some concluding comments.

2. Pressures for change in the education system.

The Discussion Paper highlighted the pressures for change coming from the globalisation of the delivery of higher education services and advances in the area of information technology (chapter 2). Other pressures for change relating to structural change in the economy, changing demands for skilled employees and the rapidly increasing expenditure on R&D by business, were given less prominence even though they could have an equally significant impact on the demands placed on the higher education system. These other pressures for change are briefly outlined below.

2.1 Structural change in the economy.

Changes in the industry structure of the economy can place demands on the education system through changes in the skills required by employees. Table 1 provides some evidence that the structure of the Australian economy is changing rapidly. The table shows how the level of employment in particular industries has changed in the last decade. The main source of employment growth over the period 1986 to 1996 was the services sector, with most services industries showing strong growth. The fall in employment in the electricity, gas and water sector resulted from rationalisation in the electricity industry.

Table 1. Change in total employment, by industry, 1986 to 1996.

Industry	Change in employment 1985-96 per cent	Average employment 1985 000s	Average employment 1996 000s
Property and business services	85	438	810
Accommodation, cafes and restaurants	68	225	379
Cultural and recreational services	47	124	183
Personal and other services	43	218	313
Health and community services	41	546	767
Retail trade	38	908	1 250
Education	30	450	585
Construction	25	479	597
Government administration and defence	16	324	374
Wholesale trade	16	422	490
Finance and insurance	13	280	316
Communication services	10	153	168
Transport and storage	9	360	393
Agriculture, forestry, and fishing	2	414	424
Manufacturing	-1	1 126	1 118
Mining	-10	99	89
Electricity, gas and water	-47	137	73
Total	24	6 702	8 329

Source: ABS Catalogue No. 6203.0 and DIST (1997a)

These changes in industry structure feed through into changes in the skill requirements of industry and the demands placed by industry on the higher education sector. It is difficult to provide a detailed breakdown of the effect of these changes in employment on the skill levels in each industry because of changes in the classifications of industries and occupations used in the official data. However, analysis of the available data indicates that over the period May 1987 to May 1997 there was a very large increase in the demand for employees with skills. Employment in high skilled occupations increased by around 43 per cent, and by 24 per cent in medium skilled occupations. By contrast, employment in the lower skilled occupations fell by 6 per cent over the same period. At an industry level the services sector recorded the greatest growth in high skilled workers (53 per cent) followed by manufacturing (30 per cent).

These large increases in skill requirements are expected to continue. The Department of Employment, Education and Training (DEET, 1995) examined the prospects for employment growth across occupations in the period 1995 to 2005. The report projected that high skill occupations such as management, professionals and para-professionals would experience strong employment growth over the next 10 years but that lower skill occupations would generally have much lower employment growth.

These data suggest that pressure is being placed on the higher education sector in two ways: by the rapidly changing industrial composition of the economy; and by the large growth in demand for skilled employees within this changing industrial composition. These developments will add to the pressure on higher education institutions to cater for an increasing number of students, to adjust quickly to the changing demands of the economy and to provide individuals with the skills needed to allow them to also adjust quickly to the changes taking place in the economy.

2.2 The vulnerability of low skilled employees.

A consequence of the shift in demand from low skilled to high skilled employees identified above is that low skilled employees have become increasingly more vulnerable to unemployment. This vulnerability is illustrated in Table 2, where unemployment rates by previous occupation are presented, along with each occupation's share of unemployed and employed people. It can be seen that those with high skills have a significantly lower rate of unemployment than those with fewer skills. Labourers and related workers and intermediate production and transport workers have the highest unemployment rates and account for a disproportionate share of unemployment compared to higher skilled occupations.

Table 2. Unemployment, by previous occupation (per cent), May 1997

Previous occupation	Unemployment rate	Share of unemployed	Share of employed
Managers and Administrators	1.2	2.0	7.6
Professionals	1.9	7.0	17.1
Advanced Clerical and Service Workers	2.5	2.4	4.5
Associate Professionals	3.4	8.2	10.9
Intermediate Clerical, Sales and Service Workers	4.1	15.1	16.7
Elementary Clerical, Sales and Service Workers	4.5	10.4	10.4
Tradespersons and Related Workers	5.6	17.1	13.7
Intermediate Production and Transport Workers	6.9	14.4	9.2
Labourers and Related Workers	9.8	23.3	10.0
Total	8.6		

Sources: ABS Catalogue No. 6203.0 and DIST (1997a)

The importance of training to employment prospects is further indicated by a study by the OECD, which found that the unemployment rate for graduates in Australia was about half that of non-graduates. A similar situation occurs in the other OECD countries examined (see *The Economist*, 13 December 1997, p88).

The vulnerability of low skilled employees provides an incentive for these employees to upgrade their skills and for students to obtain the highest level of training possible. It also puts pressure on the higher education sector to provide appropriate courses and to deliver these courses in a way that makes them accessible and affordable by low skilled employees. Inflexibilities in the present system could restrict the ability of the higher education sector to meet the needs of the low skilled.

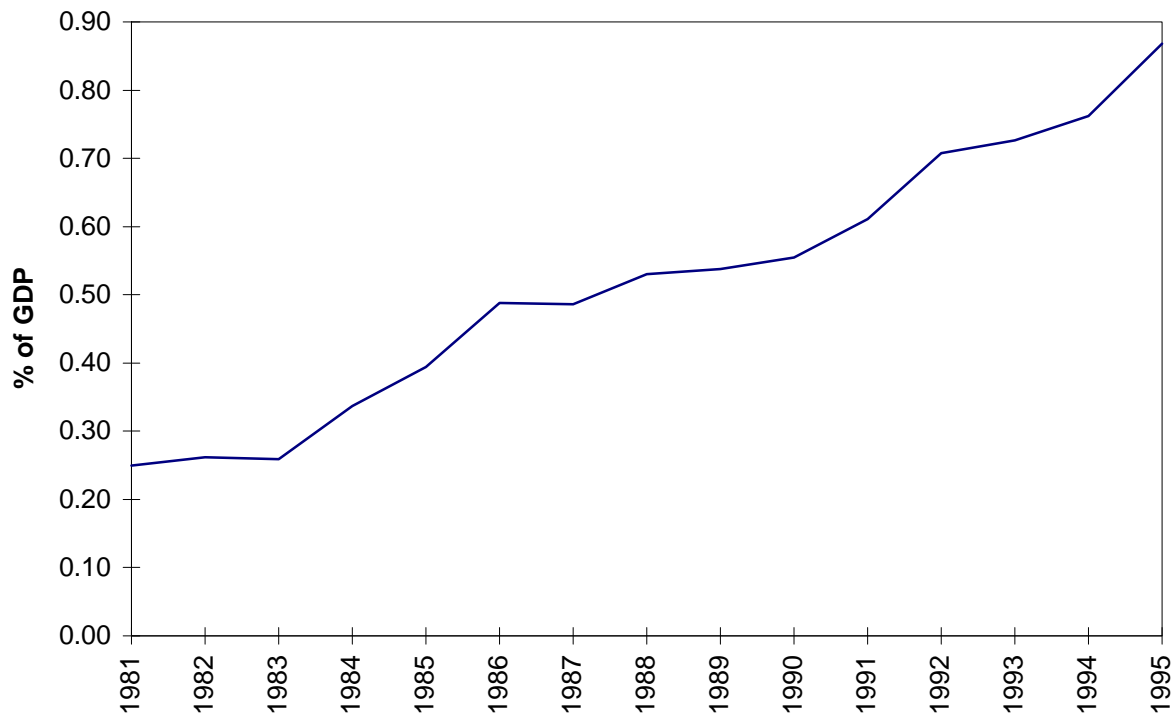
2.3 Increasing industry expenditure on R&D.

Pressure for change is also being applied to the education sector as a result of the increasing interest being shown by industry in R&D. Figure 1 shows that business expenditure on R&D has increased significantly since the early 1980s. Between 1988 and 1994 the growth rate of business R&D in Australia was the second highest in the OECD. This increase has been accompanied by an increase in the level of research collaboration between industry and universities. A recent

study for the Australian Research Council (ARC, 1997, p13) found that between 10 and 15 per cent of total higher education research involves industry linkages.

This increased involvement by industry in R&D will inevitably lead to increased demand by industry for employees with the skills to undertake R&D of relevance to industry. These skills will change as the structure of the economy changes. The higher education sector needs to be flexible enough to provide the skills that enable the employees to meet the R&D needs of industry and to be adaptable enough to change as the needs of industry and of students change.

Figure 1. Australian business expenditure on research and development as a proportion of GDP: 1981 to 1995



Source: Department of Industry, Science and Tourism, 1997

3. The efficiency of the higher education sector in providing high quality labour inputs to industry.

The previous section has shown the importance of a skilled workforce to the Australian economy, especially to industries that are growing rapidly. DIST supports the conclusions of the Discussion Paper that the best way of ensuring that the higher education sector is able to meet the needs of industry and of the broader economy is to maximise the competition between education providers so that they become more responsive to student needs. The system needs to ensure that excellence is rewarded and bad quality is penalised.

The Discussion Paper correctly sets out the major problems with the present system.

- It is supply rather than demand driven.
- Funding is provided to a set number of public institutions.
- Accountability is more to a central funding body than to students.
- Resources to public institutions are largely guaranteed by the government.

- Student fees represent the marginal cost of courses by accident rather than design.
- The level of government assistance to particular courses is not based on the public benefit society derives from those courses.
- There is limited scope for innovation in the design and delivery of courses.
- There are few incentives for private funding.
- There is limited scope for industry requirements for skills in particular areas to be met.
- There are few incentives for any interface between the university and VET sectors.
- Student fees are set differently for the VET sector, where relatively small up-front fees are imposed, and the university sector, where larger income-contingent fees are imposed through the HECS. These differences allow for strategic behaviour by students seeking to minimise the private cost of their education.
- There are greater incentives for research than for teaching in universities.

DIST believes that removing barriers to competition provides the best means of improving efficiency and increasing flexibility in the higher education sector. The Department supports the ideas in the Discussion Paper that would encourage the development of an education system with the following features.

- It is demand driven in the sense that it is students, rather than institutions, that receive government funding and students are able to choose the courses and institutions that best suit their needs.
- Suppliers receive signals about the preferences of students and are able to respond to these preferences without any government-imposed impediments that favour public over private institutions.
- It is 'seamless' in the sense that students are able to switch easily between VET and university courses both because administrative barriers have been eliminated and because HECS is available for all higher education courses. Switching between institutions, public or private, should be administratively easier than at present. As the Discussion Paper suggests, there should be greater opportunities for students to customise their courses, rather than education being considered as a package.
- It is free from any government-imposed restrictions on innovation by public and private institutions in the courses they offer to students. A range of high and low cost course options should be available to students.
- It is free of cross subsidisation between courses and between students in different stages of the same course.
- The public good component of courses is explicitly recognised and funds are provided by the government in a transparent manner to cover this public good element.
- It is competitively neutral so that private providers can compete for students on the same basis as public institutions. Competitive neutrality requires that all institutions have the freedom to set fees at a competitive level, and that public institutions are required to make a competitive return on their land, buildings and equipment. The imposition of an infrastructure charge on public institutions as suggested by the Discussion Paper will assist the attainment of competitive neutrality.

An education system based on student choice requires that students have sufficient information to correctly express their preferences. The Discussion Paper correctly points out that young adults are already expected to be capable of making discriminating choices in a wide range of activities (p42). The Paper (p33) suggests that 'an important role for government would be to facilitate the provision of performance information to students either through its own efforts or through the encouragement of private providers of information and analysis to students'. DIST suggests that the role of government in providing information should be confined to providing the conditions

under which private sector organisations could compete to provide students with the reliable, comprehensive and unbiased information they require.

DIST supports the views about the scope for better information flows made by the Industry Commission in its submission to the Review.

Within a market where opportunities for competition are being enlarged, institutions and client servicing groups will have considerable incentives to identify new information needs and seek to satisfy them. For example, institutions seeking to demonstrate 'quality' in terms of acceptance of their courses, good teaching techniques and learning outcomes would have an incentive to participate in course accreditation and quality assurance programs involving professional groups and peer assessment. Similarly, they would have an interest in demonstrating high levels of satisfaction amongst their graduates in terms of teaching techniques and learning outcomes, as well as employment (IC, 1997, p150).

Within a competitive framework there is scope for industry and industry associations to play a major role in providing high school students with information about career options, the educational requirements for these careers and the worth of particular courses for students wishing to pursue particular careers. Industry could obtain this information by collaborating more closely with institutions offering courses, and could then signal this information to students through such means as providing scholarships to students prepared to undertake particular courses or by offering courses in their own right. Such a role for industry would impose greater responsibility on industry to clarify what they require from the education system and how these requirements might best be obtained.

Industry also has a role to play in the accreditation of courses being offered by higher education institutions. Involvement in accreditation would force industry to clarify their requirements from the education system. There is a danger that professional bodies might use the accreditation power to restrict entry or competition in particular professions. The provisions of the Trade Practices Act should be strictly applied to ensure that such anti-competitive practices do not occur.

4. The development of the education sector as an efficient and competitive industry in its own right.

The Discussion Paper correctly points out that the changes it is suggesting would assist the education sector to become internationally competitive, to grow more rapidly than it is now and to meet the challenges it faces as a result of the pressures outlined in section 2. The pressures for change will, as Global Alliance Limited in its paper prepared for the Committee (Appendix 11, p11) succinctly puts it, lead to increased segmentation of markets, increased specialisation and customisation of supply of courses, and increased specialisation of providers.

DIST agrees with the Discussion Paper and with the views of Global Alliance that successful future growth depends on a more light-handed intervention by governments and a move away from the homogeneity that presently characterises the university system. In particular, DIST supports the following moves to increase the efficiency of the industry.

- Review of the government-imposed barriers to the entry of new providers. Global Alliance (Appendix 11, p36) identifies nine areas where there are formidable barriers to entry. These barriers should be rigorously scrutinised and be allowed to continue only if they provide net economic benefits to the community.

- Introduction of competitive neutrality principles to the existing public institutions. The most obvious implication of this would be that institutions would be required to obtain a market return on their land, buildings and equipment.
- Encouraging the public institutions to take a more business-like approach as a first step towards eventual deregulation.
- Ensuring that measures are in place to protect students' funds against deceitful providers.
- Ensuring that the income-contingent student fees system, whether it be HECS or some other system, is operating efficiently.

The Discussion Paper suggests that 'There may be a case for government to support, for a limited period of time, an incentive programme to attract domestic and perhaps international interest in venture capital projects in Australian higher education' (p156). The government already provides substantial assistance for the venture capital industry through the Pooled Development Funds (PDF) program and the Innovation Investment Fund (IIF). A strong case would be needed if a separate program of assistance for venture capital in the higher education area was to be sought.

The IIF program, which is administered by DIST, has been developed to help small, technology-based firms access venture capital for growth and expansion. It is this type of venture the Discussion Paper suggests will be the fastest growing in the education industry in the future. The original IIF program provided \$130 million on a 2:1 basis with private-sector capital, thereby creating potential funding of \$195 million. That funding allowed for the creation of up to six early-stage investment funds in the range of \$30 million to \$50 million each.

In the industry statement released on 8 December 1997, the Prime Minister announced an expanded IIF program involving a second round of funding. This expanded program will provide a further \$43 million over four years, to be matched at a maximum of 2:1 with private sector capital. The IIF program will now total about \$260 million in public and private funding. The funds created under the program will be restricted to investing in companies which are commercialising technology, and which have an annual revenue of \$4 million or less, averaged over the past two years, with a maximum of \$5 million in any one year (Commonwealth Government, 1997, pp34-5).

At a more general level there may be a role for government in undertaking the types of activities for the education sector that it undertakes for other industries. For example, there may be a role for the government in increasing access to world markets for Australian providers of education services, particularly given the high level of government involvement in education in other countries. Similarly, the industry would benefit if labour markets were further deregulated and if immigration laws did not unduly restrict the flow of academics and students into Australia.

5. The importance to the economy of research undertaken within the higher education sector.

The Discussion Paper (p17 and p126) identifies the following strengths of the current research and research training policy and financing framework in the higher education sector:

- a focus on curiosity driven and strategic research (which complements the research activity profiles of science agencies and industry);
- the allocation of a significant amount of funding through competitive processes open to all universities;
- a diversity of funding sources and mechanisms across Commonwealth portfolios; and

- an increasing emphasis on improving collaboration among industry, science agencies and universities.

These are significant strengths which should be nurtured and assisted by any changes made to the education system. DIST is concerned that the suggestions for change in the Discussion Paper would put some of these strengths in jeopardy and are not in keeping with the move towards greater diversity, competition and flexibility advocated in other areas of the Paper.

There are several areas of concern. Firstly, the notion that national priorities should be set for research funding could lead to a reduction in the diversity of research activities and to worthwhile areas being overlooked in favour of higher priority, but less worthwhile, areas. Research is an area where there is great uncertainty and any attempt to determine in advance the areas of R&D that are most likely to produce the greatest return to society are inherently highly risky.

National priorities set for basic and strategic research will also inevitably affect the type of research undertaken further downstream in industry and the capability of researchers in industry to undertake research in non-priority areas. In Figure 1 it was shown how industry is rapidly increasing its commitment to R&D. The establishment of national priorities could stifle the growth of some of this business expenditure on research and development.

Given the limited amount of funds available for research, it will be necessary to set standards in terms of the quality of research proposals and put in place appropriate arrangements to ensure transparency and accountability. This should be the extent of 'priority setting'. Contestability between both public and private institutions for individual and block research grants, diversity in the providers of those grants and performance monitoring of the system of grant delivery would help ensure that the positive attributes of the present system are strengthened.

Secondly, the suggestion that the Australian Research Council (ARC) should have the major input into national priority setting ignores the benefits of diversity and the role of other organisations, including DIST, which contribute to the determination of the type of research undertaken in Australia. Table 3 shows the major areas in which the Commonwealth Government provides support for research. The ARC is responsible for only 9 per cent of the total. DIST, through its responsibility for industry R&D and the Cooperative Research Centres, accounts for 18 per cent of the total. Other significant organisations are the universities, including the Institute of Advanced Studies, which together receive 33 per cent of the total Commonwealth support, CSIRO, the Defence Science and Technology Organisation and the National Health and Medical Research Organisation.

Business expenditure on R&D is not included in Table 3 but, as was shown in Figure 1, is a rapidly growing contributor to R&D expenditure in Australia. In 1994 business expenditure on R&D was equivalent to 0.74 per cent of GDP. This represented about 46 per cent of total R&D expenditure in Australia. Much of the research associated with this business expenditure was carried out in collaboration with higher education institutions and represents another significant area of diversity for Australian research.

Table 3. Major programs of science & innovation funded by the Commonwealth Government

	1997-98 estimates	Share
	\$m	%
Non-targeted higher education R&D	1182	33
Industry R&D & incentives ¹	487	14
CSIRO ²	473	13
Targeted higher education R&D ³	427	12
Australian Research Council	(321)	(9)
Other R&D agencies	259	7
Defence Science & Technology Organisation ⁴	238	7
National Health & Medical Research Council	156	4
Cooperative Research Centres	146	4
Rural R&D	145	4
Other health R&D	19	1
Other R&D grants ⁵	17	1
Total	3551	100

Source: DIST (1997b) Highlights, Summary Table.

Notes: 1. *R&D Start* Program plus the estimated effect of revenue foregone via the R&D tax concession scheme.

2. Includes funding through DPIE for the Australian Animal Health Laboratories. In addition to the budget funding shown, CSIRO expects to earn over \$268 million from external sources in 1997-98.

3. Represents the total of Budget and HEF Act funding and incorporates funds allocated on the advice of the Australian Research Council (ARC).

4. These figures include DSTO overheads that are funded through appropriations to other parts of the Defence Portfolio. They also include capital works appropriations principally attributable to DSTO.

5. Australian Biological Resources Study, Greenhouse research grants, Energy R&D and Australian Road Research Board.

Thirdly, if the role of the ARC in formulation of policy is increased there is scope for a conflict with the program delivery function of the ARC. For example, the ARC has a number of schemes aimed at increasing research collaboration between industry and universities. The schemes are the Collaborative Research Grants Scheme (for which \$29 million was allocated in 1997-8), the Australian Postgraduate Awards (Industry) (up to \$12 million), and the Key Centres of Teaching and Research (\$5 million) (ARC, 1997, p12; DIST, 1997b, p5.10-p5.12). DIST also administers a number of programs involving research collaboration between industry and universities. The major DIST collaboration program is the Cooperative Research Centres program, for which \$146 million was allocated in 1997-8. DIST also administers the Collaborative Grants program and the Graduate Based projects program as part of the R&D Start scheme. In addition, collaboration between industry and universities occurs through grants to firms provided under the R&D Start program and through firms which are claiming the 125 per cent tax concession for R&D. DIST is concerned that centralisation of research policy in the ARC could put at risk some programs not under the direct control of the ARC.

Fourthly, the suggestion in the Discussion Paper that an explicit priority setting role for the ARC could include:

- improving the effectiveness of programmes for knowledge and skills transfer and enterprise generation linked to university research; and
- strengthening research links with advanced countries, and engaging countries in the Asia-Pacific region with a view to building competitive advantage in the region relative to other advanced countries (p130).

also ignores the role of DIST in these areas. DIST administers a number of activities of direct relevance to skills transfer, collaboration between researchers and international collaboration. These programs involve:

- raising awareness of the importance of science and technology in the Australian community (Science and Technology Awareness Program);
- delivering programs which enhance the public research infrastructure, facilitate collaboration between researchers and between researchers and users in the public and private sectors (Cooperative Research Centres program, Major National Research Facilities program); and
- fostering international collaboration in science and technology, both through bilateral and multilateral arrangements with other countries through the International Science and Technology Program, and by maintaining Australia's leading role in the Asia Pacific Economic Cooperation (APEC) Industrial Science and Technology working group.

In summary, DIST supports the view of the Industry Commission in its report on R&D (IC, 1995, p150) where it laid down the following guidelines for R&D policy.

- Diversity should be encouraged.
- Private incentives should be built on wherever possible.
- Assistance schemes should be simple and transparent, with well-defined criteria.
- Research should be monitored and evaluated.
- Assistance levels should be consistent in comparable circumstances.
- Contestability should play a major role in funding R&D.
- The Government's objectives and roles should be clear.

Because this Department is so heavily involved in providing funding to R&D, including research undertaken by the higher education sector, DIST would expect to be involved in any consideration of future arrangements for research funding, priority setting and collaboration between industry and higher education providers.

6. Conclusions

The Department therefore has a major interest in three aspects of the development of the higher education sector examined in the Discussion Paper.

- The efficiency of the sector in providing high quality labour inputs which meet the needs of industry.
- The development of the sector as an efficient and competitive industry in its own right.
- The need for high quality research which will enhance the technological and innovative capacity of the economy and which can be used to further the international competitiveness of Australian industry.

The Discussion Paper highlighted the pressures for change coming from the globalisation of the delivery of higher education services and advances in the area of information technology (chapter 2). Other pressures for change relating to structural change in the economy, changing demands for skilled employees and the rapidly increasing expenditure on R&D by business were given less prominence even though they could have an equally significant impact on the demands placed on the higher education system.

DIST supports the conclusions of the Discussion Paper that the best way of ensuring that the higher education sector is able to meet the needs of industry and of the broader economy is to maximise the competition between education providers so that they become more responsive to

student needs. The system needs to ensure that excellence is rewarded and bad quality is penalised.

While DIST supports the development of an internationally competitive higher education industry it is not clear that there is a case for a separate program for venture capital programs in the higher education area, even in the short term. The existing Pooled Development Funds and IIF programs administered by DIST appear to be adequate to meet the needs of education providers seeking government assistance with venture capital.

The treatment of research funding in the Discussion Paper is somewhat at odds with the move towards greater diversity, competition and flexibility advocated in other areas of the paper. In particular, DIST does not support the notion that national priorities for research be established or that the ARC be given a much more prominent role in policy making. The aim should be to encourage diversity and competition wherever possible. Government programs should be simple and transparent, with well-defined criteria and subject to regular evaluation.

In summary, DIST:

- supports moves to make the education sector more competitive and demand driven;
- supports moves to make the education industry more efficient through removing impediments;
- does not support any moves towards establishment of national research priorities;
- would want to be included in any arrangements associated with future research funding, priority setting and collaboration between industry and higher education providers.

References

Australian Research Council (1997) *Information Paper*, Submission to Review of Higher Education Financing and Policy.

Commonwealth Government (1997) *Investing for Growth. The Howard Government's Plan for Australian Industry*, Commonwealth of Australia, Canberra.

Department of Employment, Education and Training (1995) *Australia's workforce 2005*, AGPS, Canberra.

Department of Industry Science and Tourism (1997a) *Industry Brief, Industry Employment and Unemployment*, August.

Department of Industry Science and Tourism (1997b) *Science and Technology Budget Statement 1997-98*, AGPS, Canberra.

Industry Commission (1995) *Research and Development*, Report No. 44, AGPS, Canberra.

Industry Commission (1997) *Industry Commission Submission to the Review of Higher Education Financing and Policy*, Industry Commission, Canberra, July.