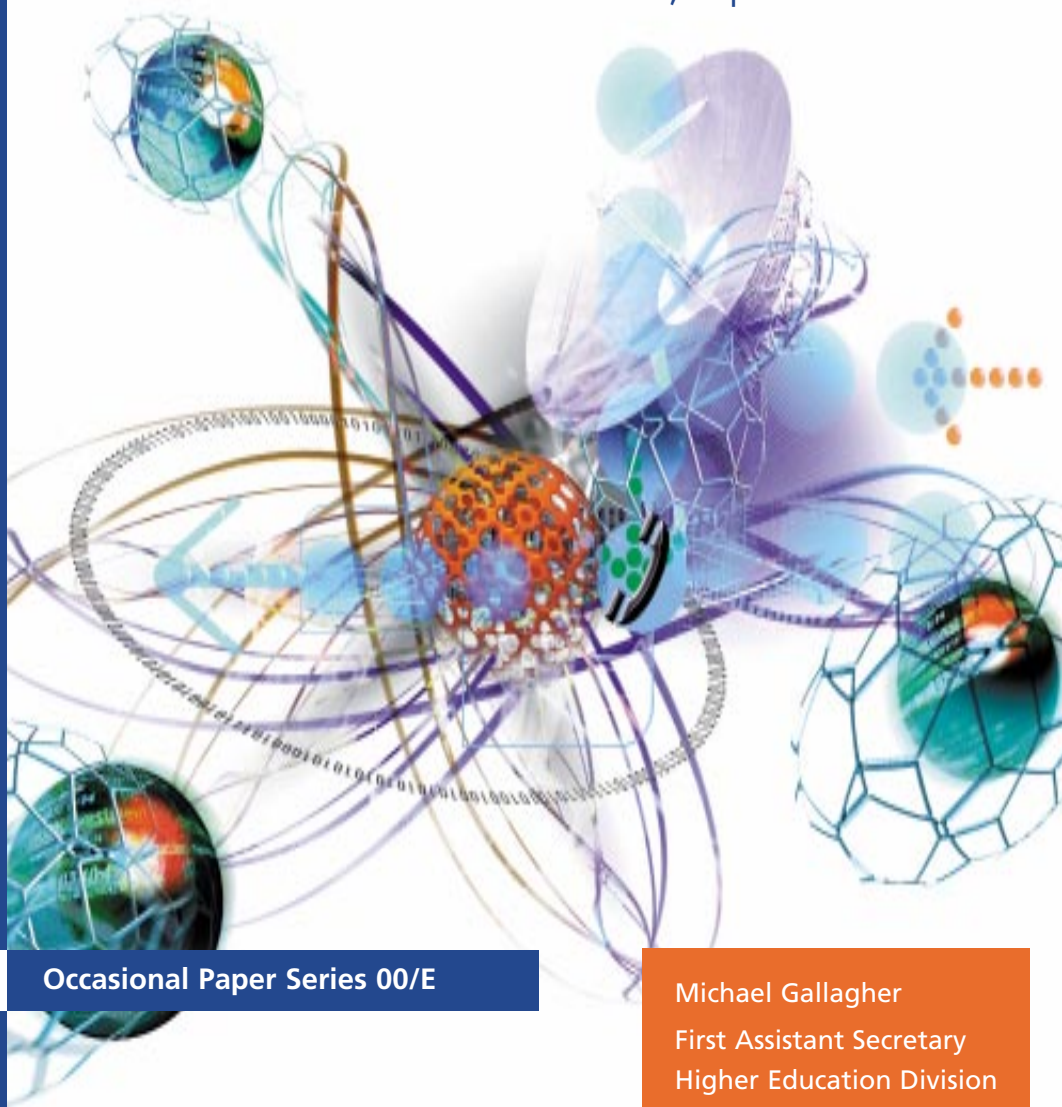
Department of Education,
Training and Youth Affairs

The Emergence of Entrepreneurial Public Universities in Australia

Paper presented at the IMHE General Conference of the OECD Paris, September 2000



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1. Introduction

This paper traces the policy settings and organisational changes associated with the growth of self-earned income by Australian public universities since the mid-1980s. Two phases of state-university interaction are observed, the first pulling away from traditional academic orientations and the second pushing towards stronger market influences. Shifts in the composition of earned income are described. Key features are outlined regarding changes to the orientation and organisation of universities in their transformation as commercially managed enterprises, contributors to the national innovation system and producers of graduates with explicitly-defined capabilities. Several environmental factors influencing the form of universities are discussed together with some features of the strategic responses of leading universities. Finally, observations are made on changes emerging in university-state relations.

The notion of public universities becoming entrepreneurial is an ambiguous one and presently the subject of debate among academic and public communities in Australia.[1] It is a multi-dimensional concept with some apparently, though not necessarily inherent, yet still arguable, contradictions. Australia's public universities are variously becoming entrepreneurial in inter-related ways:

a) **as multi-million dollar academic enterprises** earning income from diverse sources, developing new products and new markets, obtaining sound returns on investment and in so doing, adopting modern commercial management practices—while striving to preserve longstanding academic values and collegial processes;

b) **as knowledge contributors to the national innovation system** developing the processes for applying academic research, teaching and consulting services to invention and problem solving, including the growth of businesses and the cost-effective addressing of social and environmental problems–while valuing the broad pursuit of knowledge;

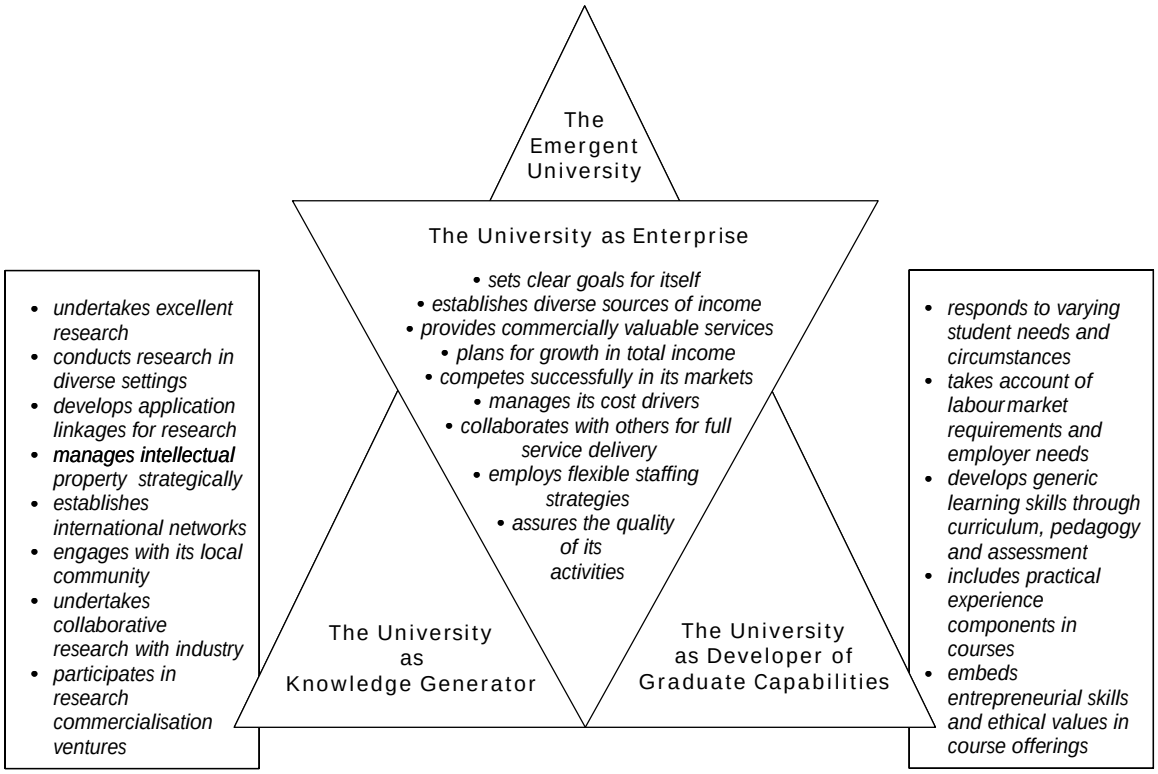
c) **as producers of graduates with relevant capabilities** for their use as employees, self-employed professionals or employers, with increasing involvement of fee-paying learners in commercially-sponsored units of study and working in enterprise settings—while aiming to enable people to develop broad foundation learning skills for life; and

d) **as emergent organisations taking on new forms** with flexible internal and external networks accommodating new sets of expertise and new cultures, multiple links with local communities and enterprises, and with other universities and for-profit businesses, nationally and internationally, as partners

[1] Many articles in Australian newspapers and journals have appeared in recent years, such as, 'Big business and academic research', *The Canberra Times*, 9/4/1999; 'Corporate academia', *The Bulletin*, 11/7/2000; 'Degrees for sale', *Business Review Weekly* 28/7/2000; 'How to strangle education', *Australian Financial Review*, 3/8/2000.

in ventures or strategic alliances—while seeking to consolidate a coherent identity and establish cohesion within their scholarly communities.

Figure 1 The entrepreneurial public university



Key characteristics along each dimension are shown in Figure 1. These characteristics are displayed diversely among the universities and within them, ranging across Faculties/Schools/Departments and Service Units. Some universities are more generally enterprising than others, through necessity of circumstance and/or strong leadership. None have yet developed the 'integrated entrepreneurial culture' that Burton Clark identified of international pacesetters in 1997 (Clark, 1998). Australia's public universities express a diversity of cultures internally but are commonly driven by a mission to advance the public good through the generation and transmission of knowledge. Making money has not become their core business; revenue generation is a means to sustaining the university's broader purposes.[2]

[2] Australia's higher education system differs from those of America and Asia in that it is almost totally comprised of public providers. Australia's public universities differ from most European universities in being structurally independent of and increasingly less reliant on financial support from the state. They are largely autonomous in respect of student admissions, staffing structures and appointments, curriculum content and design, teaching and learning and assessment processes, internal budget allocations, research activities and publication of findings and viewpoints, and international collaboration and commercial ventures.
Student participation in higher education has consistently, over several decades, involved full-time, part-time and external modes, broadly in the ratio of 60 per cent : 27 per cent : 13 per cent. The majority of students enrol in courses that lead to qualifications for professional practice upon graduation, such as for accounting, architecture, dentistry, engineering, nursing, teaching and veterinary science. Several professions require supervised practical experience for the purpose of

Most of the 'new' action in Australia relates to overseas student fee-paying markets and domestic postgraduate fee-paying markets. Effective demand for teaching and associated services is strongest for business-related studies including ICT, health-related professional studies and legal studies. Consulting markets predominantly involve financial and management services, and applications of science and technology to specific industrial, environmental and social problems, through analysis, modelling and testing, surveys and diagnostics, and—for specific business purposes—geophysical or genomic mapping. Commercial interest in R&D is concentrated in the cross-disciplinary fields of application-oriented research in the biosciences, material sciences, and information and communications technology.

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demonstrating competence to practice, such as internships for medicine and practical legal training for lawyers. A significant number of students undertake general studies in the Humanities and Social Sciences and in several fields of the Physical Sciences. Broadly half of the student intake is direct from school and half mature-aged. The majority (55%) of students are female.

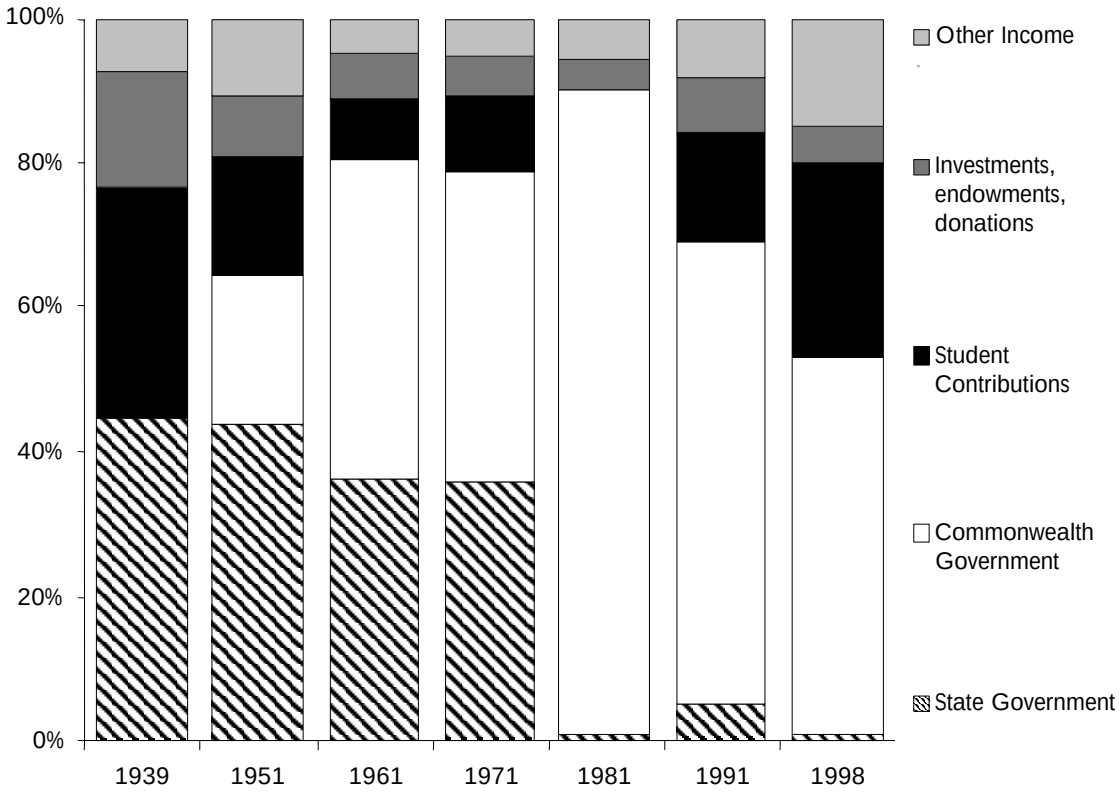
In law, the universities own themselves. They are free to use all the resources at their disposal, unless specifically encumbered and consistent with relevant laws, to advance the purposes for which they are constituted. They are, with a few exceptions, established under laws of the States and Territories which define their powers and governance structures, and they are subject to the accountability and audit requirements of those jurisdictions. Almost all the public funding of Australian universities is provided by the federal Government, most of it in the form of a single block grant for operating purposes, and the universities account for it through their provision of data on the profile of their enrolment of students across fields and levels of study each year, together with the acquittal of funds provided for specific-purposes.

A dual funding system operates in respect of university research activities. General operating grants are payable to universities for their research and research training activities and for the infrastructure costs associated with those activities. The allocation of such payments is formula-driven, reflecting institutional performance. A system of peer-reviewed, competitive funding for researchers and research projects is supported through two national research funding advisory councils: the Australian Research Council and the National Health and Medical Research Council. Specific-purpose funding to universities is also provided from several government agencies, such as for industry development and university-to-industry linkages, and for health and environment interventions.

2. Main drivers of development

This development is driven partly by the 'push' of government policies and incentives and partly—and increasingly—by the 'pull' of new market opportunities. The 'push' includes a shift from state support to state assistance over the past two decades (see Figure 2), involving an imperative for universities to expand their income from non-government sources, and a shift from tight to loose regulation, encouraging the universities to be more responsive to varying student needs and diversify their offerings so as to widen user choice.

Figure 2 University income by source

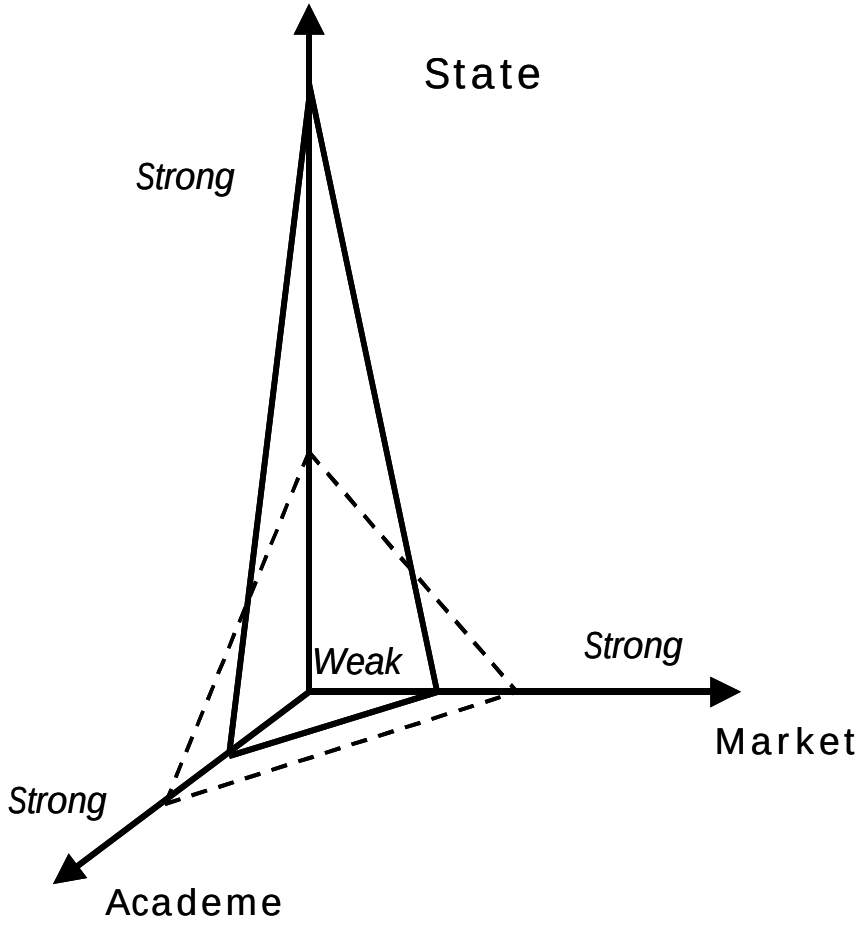


Sources: Australian Bureau of statistics, 1939, 1951, 1961, 1971; Commonwealth Tertiary Education Commission, 1981; DEET, *Selected Higher Education Statistics*, *1991*; DETYA, *Selected Higher Education Finance Statistics, 199*8]

The 'pull' includes the changing demand for higher education, which is both increasing and diversifying with the growth of the knowledge economy, facilitated by the expanding capacity of communications and information technology on a global basis. It also involves the attraction of potentially substantial financial rewards from the commodification of knowledge and the commercialisation of academic work.

In 2000, Australia's higher education sector receives more than half its total income from non-government sources[3] and that share is projected to continue to grow. Consequently, change is being increasingly initiated by the universities, and more and more independently: in redesigning their services; capturing new markets; commercialising their knowledge outputs; internally reorganising; and externally networking. The changes of the past two decades can be understood with reference to Burton Clark's 1983 depiction of the interactions of 'state authority', 'academic oligarchy' (expert power of the professoriate) and the 'market', as illustrated in Figure 3.

Figure 3 Directions of influence: strong state



[3] Income from the Higher Education Contribution Scheme (HECS) is treated here as income paid by students rather than by Government Note, however, that the Government covers the cost of the discount offered for upfront payment as well as the costs of deferred payment.

2.1 The shift from academic-referenced to state-referenced direction

While the changes to the structural relations between universities and the state in the late 1980s represented a shift of power from the buffered academy to the state[4], the policy intent of the shift was to make universities more responsive to the market. The federal Government had adopted macroeconomic and sectoral policies designed to integrate Australia more competitively into the world economy, and effective human capital investment was seen as instrumental to that end:

> *The society we want cannot be achieved without a strong economic base. In Australia, this now requires a greatly increased export income, a far more favourable balance of trade than at present and a considerable reduction in our external debt. It also requires a shift in the traditional profile of our economic activity. Our industry is increasingly faced with rapidly changing international markets in which success depends on, among other things, the conceptual, creative and technical skills of the labour force, the ability to innovate and be entrepreneurial.*
> (Dawkins, 1988, p. 6)

This was a contentious stage of assertion of influence by the state over academe.[5] It involved adoption of a supply-side central planning approach (see Figure 4) to higher education including government-driven amalgamation of institutions across the former university and college of advanced education (polytechnic) sectors, central allocation of single block operating grants on a rolling triennial basis for student places at normative prices, categorical funding to meet national priorities, and requirements on institutions to produce planning and performance documentation. Increased public expenditure for growth was provided alongside the introduction of a mechanism for students to pay a share of the costs either in up-front fees or on a deferred basis through income-contingent loans (HECS).[6]

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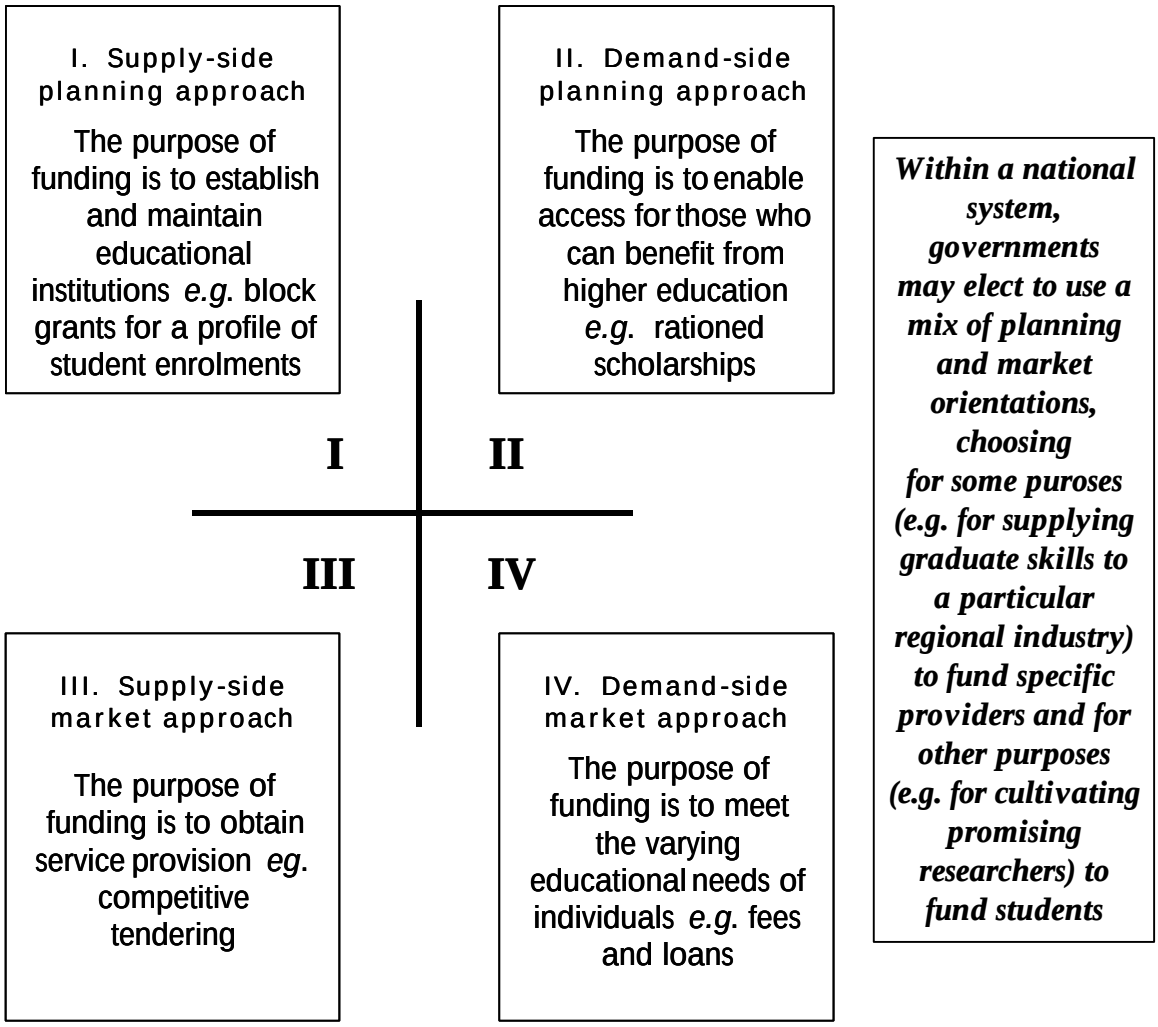
[4] Australian higher education institutions, including Universities, Colleges of Advanced Education and Institutes of Technology were variously buffered in their relations with the federal and state governments by semi-independent Commissions which advised on policy matters and resource allocations. From 1988 the resource allocation responsibilities were transferred to the Commonwealth Department and the various State Commissions were gradually wound up.

[5] The reaction from academe to the direction of reform was to attack instrumentalism, economic rationalism and managerialism as undermining the traditional, collegial culture of the university which is predicated on the free flow of ideas and free choice in individual action regarding teaching and research (Bessant, 1992). The market-oriented reaction identified five main areas of concern arising from the post-Dawkins developments: over-centralisation and bureaucratic intrusion; a tendency to uniformity in university aspirations and behaviour; inherent instability associated with new institutions merged from conflicting cultural traditions; a declining level of public funding per student without options for universities to raise revenue outside the tight regulatory framework; and the massification of higher education including those who might be more able to benefit from vocational education and training. Deregulation (of student volume and pricing controls) was seen to be the next necessary and inevitable phase of higher education policy development. [Karmel, P. 'The Australian University into the twenty-first century', *The Australian Quarterly*, Autumn 1992, Volume 64, No. 1

[6] The Higher Education Contribution Scheme (HECS) requires students to pay fees as a proportion of course costs and provides a mechanism for students to obtain a loan that they repay through the taxation system once their income reaches a certain threshold. HECS applies only to government-funded undergraduate and postgraduate courses. The prices for HECS courses are set by the Government, are standard across all institutions, varying by level and field of study.

Figure 4 Higher education funding models



The 1989 Policy Statement, *Research for Australia, Higher Education's Contribution,* set an agenda for increasing the national return on science through processes that directed resources for research to the best researchers through a policy of selectivity and concentration. The policy intent was that institutions 'will increasingly be funded according to what they do rather than according to an arbitrary classification based on institutional title':

> *Research funds should be allocated competitively, and should go to those institutions, research groups and individuals best able to make the most effective use of them.*
>
> (Dawkins, 1989)

An amount ($65 million in 1987 prices) was clawed back from university operating grants over a three-year period and redistributed to the Australian Research Council and the National Health and Medical Research Council for competitive allocation. The Government encouraged institutions to adopt a flexible approach to salary determination, develop non-salary remuneration packages and offer staff access to

consultancy income, to enable institutions to attract and retain high quality staff in disciplines in which there is strong demand. The policy framework also encouraged, wherever possible, the allocation of funds in a manner which encouraged contributions from other sources such as industry, State governments, other research agencies and institutional resources. A number of research priority areas were identified for five-year, performance-based funding, including: materials science, including aspects of mineral processing; scientific instruments and instrumentation; cognitive science; molecular approaches to the management of Australia's biological resources; and marine science and technologies. Research proposals in the designated priority areas were to be judged on the basis of scientific or technological merit, the commercial potential or utility of the proposal, the extent to which the research would lead to collaboration between institutions (or groups within an institution), and the probable impact of a successful outcome for the research (Dawkins, 1989, p. 25).

The internal administration of universities was, in several instances, strengthened through the formation of centralised structures and processes for planning and budgeting, curriculum development, information systems development, research management and international marketing. Centralisation of responsibilities was more likely to be a characteristic of new, smaller institutions and those derived from the former CAE sector. Devolution of responsibilities to Faculties and Departments in respect of planning and budgeting was more likely to be a characteristic of those universities established before the amalgamations era.

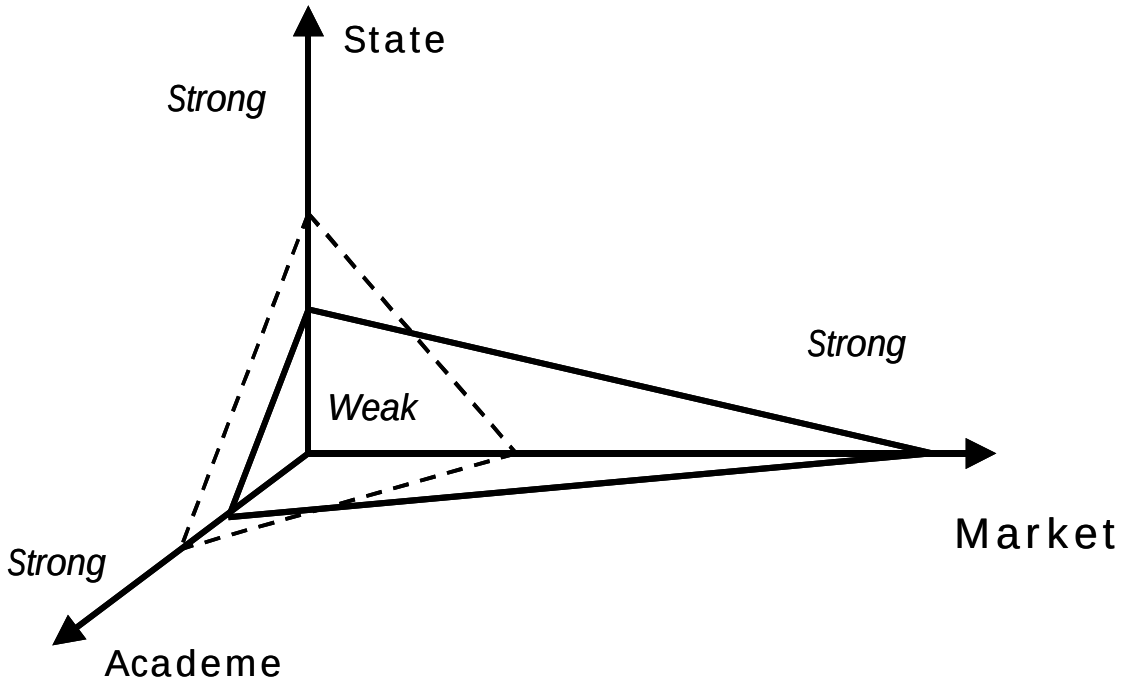
In each successive year following the Government's 1988 White Paper, the practice of policy became less prescriptive and more driven by incentives than mandates. National targets for graduate output by fields of study were abandoned, data collections were reduced and requirements for mandatory research management plans were disbanded. Project-specific capital works financing was replaced by a 'roll-in' of capital funding into general operating grants for maintenance and new developments, with the quid pro quo that universities would develop capital management plans. This change caused universities to attend to the condition of their stock and focus on issues of capital depreciation, utilisation efficiencies and investment strategies. Detailed approval and accounting processes for course shifts across fields of study were relaxed, giving the universities greater discretion to be responsive to changes in demand, and opening up competition among them domestically both in fields of study and in regions.

The universities were encouraged to internationalise their research, curricula and student experience, as part of Australia's effort to better understand the cultures and expand economic links with other nations. They were also encouraged to develop markets for overseas fee-paying students, as part of a broader policy shift from aid to trade in foreign relations. Opportunities for expanding domestic fee-paying programmes and services were also opened up at the postgraduate level, for non-award short-courses and for accelerated award course provision. The universities responded variously to these demand-side financing opportunities, with some becoming aggressively competitive. Commercial arms of universities became increasingly active. There was growth of investment in science and technology precincts, including incubators for business start-ups and involving university, State government and industry resources. Various agencies of government developed new relations with universities, including through tendering for collaborative

projects with industry, where government funding was made conditional on universities contributing defined inputs and meeting prescribed performance standards.

This stage of development, while smoothed by government-funded growth, was controversial at the time. Some expressed concern at the rapid expansion of Higher Degree by Research enrolments in new universities lacking a track record of research performance and quality of experience in research supervision. Others expressed concern at the admission of students to degree programmes who did not demonstrate capacity for advanced study. And some expressed concern at the proliferation of enrolments and graduates in Law. Slack central planning was seen to be an unhealthy hybrid, preventing the best from innovating and encouraging the mediocre to expand (OECD/DEET,1993; DEET, 1993) .

Figure 5 Directions of influence: strong market



2.2 The shift from state-referenced to market-referenced direction

In the mid-1990s, governments sought to further reduce dependency of universities on the state and to enable them to respond more directly to market signals, by raising the levels of user payments relative to public investment,[7] relaxing some of the rules related to charging student fees[8] and pressing the universities to make genuine productivity gains for salary rises negotiated through enterprise-specific bargaining.[9]

Government policy has focused more recently on strengthening the incentives for universities to develop research links to national innovation, concentrating research expertise to develop centres of excellence, improving the relevance and efficiency of training for research students, and reinforcing the overall quality assurance framework.[10] The intent of policy is to strengthen the links between the work of universities and the market:

> *Even though there has been a substantial increase in overseas science and technology linkages by the Australian higher education sector over the past fifteen years, these interactions are largely occurring within the academic community. To capitalise on the benefits that knowledge brings us, stronger connections need to be made between the producers of knowledge and the users of their research—both internationally and domestically.*
>
> *Building on a strengthened effort in basic research, this exchange of knowledge between researchers and the users of research must be a defining characteristic of Australia's higher education research system. This will involve greater participation of users in determining priorities for funding and performing research. Strong links*

[7] The 1996–97 Budget reduced the forward estimates of operating grants for universities by 6 per cent over four years and signalled a halt to further funding for growth in student places at full subsidy levels, while introducing a mechanism for marginal funding of students enrolled above fully-funded targets. The same Budget raised the level of student contribution across three course group bands (to 43 per cent of costs on average) and lowered the threshold for the repayment of HECS debts to the first increment level on the personal income tax scales in order to accelerate revenue flows to government.

[8] The reductions to the forward estimates of operating grants from 1996 were associated with reductions in student load targets of universities, taken almost entirely in postgraduate coursework places, requiring the bulk of future enrolments in those courses to be fee-paying. Since 1998, fees can be charged to undergraduate domestic students up to a ceiling of 25 per cent of enrolments in a course. From 2000 the mechanism permitting cross-subsidisation of domestic postgraduate fee-paying courses from funded load has been abolished. Floor prices are set for overseas fee-paying students at a level of full cost-recovery to avoid Australian taxpayers subsidising overseas students. Where domestic students can be charged fees there are no floor nor ceiling price controls.

[9] In 1995 the then Commonwealth Government refused to provide full automatic supplementation for staff salary rises achieved through enterprise bargaining, requiring the universities to find the component above a general price adjustment index through internal efficiencies and external earnings. The incoming Government in 1996 retained this policy. The non-funded gap between operating grant indexation and actual salary average outcome has accumulated to around 15 per cent.

[10] National protocols relating to qualifications, accreditation and quality audits have been agreed between the Commonwealth, States and internal Territories (www.detya.gov.au/highered/mceetya_cop.htm)

> *to the innovation system will provide for greater movement of researchers across the various research settings, able to take advantage of specialist knowledge regardless of whether it exists within institutions or in commercials settings. The linkages should also extend to the provision of research training, where students will learn skills in both academic and industrial environments.*
>
> *The culture of university research also needs to better recognise and reward the partnerships made with other members of the national innovation system. By doing so, it should be more entrepreneurial, seeking out opportunities in new and emerging fields of research that will provide social, cultural and economic benefit. Australia's researchers are well used to producing truly excellent work. An entrepreneurial approach is needed to harness the full cycle of benefits from their endeavours through commercialisation, where appropriate. This culture of entrepreneurship needs to be the context for the training of our research students, and indeed all students.*
>
> (Kemp, D.A., 1999, pp 4–5)

The implementation of this policy intention has required a modified form of state intervention for steering the transition. In contrast to the approach of the mid-1980s, when central planning priorities shaped the intervention mechanisms, the present approach relies more on benchmarked competition, neutral incentives and transparency of information. These mechanisms promote the exercise of student choice and institutional diversification. Funds for research training are to be separated from funds for other (non research degree) courses and made contestable through a performance-based funding formula that rewards student completions and research income won from research funding councils and industry.[11] Research and research training management plans are required, including an identification of research active staff and their outputs. The plans and performance improvement indicators of universities are to be published annually and their claims verified periodically through external quality audits. Each university is having to focus on its distinctive strengths and in so doing, differentiate itself from others. Within each university the research performing areas and individuals—those earning income, supervising students to graduation, and producing refereed outputs—are being identified and monitored with a view to maximising institutional success. The once common aspiration to comprehensive excellence is now subject to serious reconsideration by each university.

2.3 Growth in universities' earned income

The **total operating revenue of universities** has grown by 42 per cent from 1992 to 1999. Student contributions to university revenues through fees and charges (including HECS) have grown by $1.4 billion from 1992 to 1999, representing 55 per cent of the overall increase in resources available to the sector (see Table 1).

[11] The new Institutional Grants Scheme formula for infrastructure funding will comprise three elements: research income (60%); research student EFTSU (30%); and research outputs (10%). The new Research Training Scheme formula for allocating Higher Degree Research scholarships will comprise three elements: student completions (50%); research income (40%); and research outputs (10%). Research income will be equally weighted from all sources. Income, completions and outputs data will be averaged over two years.

State governments have been effectively withdrawing from funding higher education, though recently the Queensland, Victorian and Australian Capital Territory governments have provided support for science and technology R&D projects, and regional development initiatives, and some States are showing a renewed interest in the provision of bonded student scholarships.

Table 1 University revenue by source, Australia 1992 and 1999

Revenue Source	1992 ($m)	1999 ($m)	Growth ($m)	(%)
Federal Government Grants	3548.4	4294.8	746.4	(21)
Higher Education Contribution Scheme	789.1	1451.0	661.9	(84)
State Government	270.3	89.5	-180.8	(-67)
Other research grants and contracts	127.6	385.2	257.6	(201)
Scholarships and prizes	10.9	20.4	9.5	(86)
Donations and bequests	107.9	114.6	6.7	(6)
Investment Income	212.2	289.6	77.4	(37)
Fees and charges:				
Continuing education	44.1	67.6	23.5	(53)
From fee-paying overseas students	285.9	700.9	415.0	(145)
From fee-paying Australian students	27.7	152.2	124.5	(450)
Other fees (for service) and charges	260.7	412.3	151.6	(58)
Other Operating Revenue	276.9	536.9	260.0	(94)
Total Operating Revenue Before Abnormals	5962.0	8455.7	2493.7	(42)

Source: DETYA, Selected Higher Education Finance Statistics, 1992 and 1999

The mix of Commonwealth grants from budget appropriations and HECS-sourced payments via the HECS Special Account has been changing (see Table 2) with increasing student numbers and accelerating repayments of student debt**.** **Commonwealth Government payments** to universities, including advances for HECS students have been broadly maintained in real terms from 1983 through to 2000 in respect of planned enrolments.[12] However, the majority of the universities are over-enrolled against their funded targets, and some significantly so. Undergraduate over-enrolments in 1999 totalled 26 245 across Australia, with nine universities over-enrolled by more than 10 per cent and two by more than 20 per cent. From 1998, the Government has paid universities a marginal rate for undergraduate over-enrolments on the expectation that institutions could accommodate some 3 per cent to 5 per cent extra students within their fixed cost

[12] In 1983 funding per (planned) EFTSU (in constant 2000 outturn prices) was $13 136; in 1993 the figure was $13 237 and $13 777 in 1998. The lowest year was 1987 ($12 682) and the highest 2000 ($13 921).

parameters. The additional cash flow for some universities with unexpectedly high levels of over-enrolment appears to have been net revenue negative.[13]

Table 2 Commonwealth grants and HECS—sources of higher education finance, 1990 to 2000 ($'000 in 2000 prices)

Sources of Higher Education Finance	1990 ($'000)	1992 ($'000)	1994 ($'000)	1996 ($'000)	1998 ($'000)	2000 ($'000)
Commonwealth Grants	3965	4085	4698	4875	4437	4291
HECS	735	906	985	996	1499	1696
Total	4700	4991	5633	5871	5936	5987

Source: DETYA. 1990, 1992,1994, 1996 and 1998 actuals, 2000 estimate

University revenue derived from *other than* Commonwealth grants, HECS, over-enrolment payments and State government grants, can be considered to be **'earned income'**.[14] For the sector as a whole, earned income as a proportion of total revenue rose from 23 per cent in 1992 to 32 per cent in 1998. Fifteen universities increased their earned income share by more than 10 percentage points and three by more than 20 points (see Table 3). Fee-paying student numbers (EFTSU) grew by 68 586 (180%) from 1992 to 1999 to represent just over 20 per cent of total student enrolments (EFTSU). Five universities have more than 30 per cent of their enrolments as fee-paying students and another three have more than 25 per cent. On the basis of discussions with universities, the growth in earned income for many has been accelerating since 1998.

Table 3 Earned income as a percentage of total income

Institution	1992 (%)	1998 (%)
New South Wales		
Charles Sturt University	24	31
Macquarie University	30	33
University of New England	22	23
Southern Cross University*	n/a	22
University of New South Wales	35	37
University of Newcastle	29	29
University of Sydney	30	34

(continued)

[13] The marginal rate for over-enrolment is the minimum up-front discounted HECS rate ($2 598 in 2000). Hence the marginal payment is at no cost to government. Universities maintaining their student:staff ratios while absorbing additional students at over-enrolment rates above 10 per cent have extra salaries expenses. In the case of one university the cost to benefits ratio of their over-enrolment, using a fixed costs estimate, was 3:1.

[14] HECS income, while a student contribution, is included as grant income because it flows in accordance with government-allocated student places.

Table 3 Earned income as a percentage of total income (continued)

Institution	1992 (%)	1998 (%)
University of Technology, Sydney	18	29
University of Western Sydney	16	22
University of Wollongong	26	32
Total New South Wales	*27*	*32*
Victoria		
University of Ballarat	16	30
Deakin University	17	37
La Trobe University	20	35
Monash University	25	43
Royal Melbourne Institute of Technology	17	42
Swinburne Limited	25	32
University of Melbourne	23	29
Victoria University of Technology	12	28
Total Victoria	*21*	*36*
Queensland		
Griffith University	21	29
James Cook University of North Qld.	14	24
Queensland University of Technology	17	25
University of Central Queensland	21	34
University of Queensland	31	35
University of Southern Queensland	21	30
Total Queensland	*24*	*30*
Western Australia		
Curtin University of Technology	25	38
Edith Cowan University	13	25
Murdoch University	21	32
University of Western Australia	30	47
Total Western Australia	*24*	*38*
South Australia		
Flinders University of South Australia	11	31
University of Adelaide	14	31
University of South Australia	10	19
Total South Australia	*12*	*27*

(continued)

Table 3 Earned income as a percentage of total income (continued)

Institution	1992 (%)	1998 (%)
Tasmania		
Australian Maritime College	44	32
University of Tasmania	18	19
Total Tasmania	*21*	*20*
Northern Territory		
Northern Territory University	6	25
Total Northern Territory	*6*	*25*
Australian Capital Territory		
Australian National University	21	27
University of Canberra	21	32
Total Australian Capital Territory	*21*	*28*
Multi-State		
Australian Catholic University	10	13
Total	23	32

* Separated from University of New England in 1994

Overseas fee-paying students total 85 820 EFTSU in 2000 and the universities are projecting numbers to increase to 112 000 EFTSU by 2003. University revenue from overseas fee-paying students has continued to rise. Total reported overseas fee income grew by 22 per cent over 1997 to 1999 to $805 million.[15] Fee-paying places rose over the period by 34 per cent so that average revenue per EFTSU declined by 8.5 per cent for the sector overall. Some institutions have experienced continuing aggregate income growth but with declines in excess of 30 per cent in average revenue per EFTSU. Some have reportedly shaved their margins in the light of more intense competition from other suppliers, changes in demand factors in Asian markets subject to economic and social instability, and new (on-line) products and services. Some are changing the structure of on-shore (in Australia) study, using shorter-duration study abroad programmes. Others are growing their overseas student numbers off-shore at a faster rate than their on-shore growth and have entered into partnership arrangements that reduce their expenses and increase their volumes, giving them aggregate income growth but lower revenue per student.[16] Such activity is more exposed to risks of currency fluctuations and bad debts. A few are seeking 'high-end' partnering to more affluent markets, a couple

[15] Australian Education International, *Overseas Student Statistics* 1999, DETYA. 2000. Note the difference with data in Table 1, reflecting coverage of institutions.

[16] The Australian University provides curriculum content and on-line learning materials. Some control the assessment processes themselves while others arrange for contractors to do the assessments according to university guidelines, with 'spot marking' by Australian academics of materials submitted by students for assessment. The partner provides campus amenities, student recruitment, teaching, tutoring and other services, including, where appropriate residential services.

with sophisticated multi-media consortia. Issues variously arise regarding adequate knowledge of costs for pricing and partner negotiations and also regarding assurance of quality and reputation.

Fee-paying revenue from domestic postgraduate and undergraduate students has been rising rapidly, after a period of initial reluctance by several universities to offer fee-paying courses. With regard to postgraduate coursework, the policy up until 1999 allowed universities to charge students fees both inside their funded load and outside it. This facility for cross-subsidisation was directed to growing the market. The room for universities to cross-subsidise contracted after 1996 when enrolment targets were reduced to match reductions in budget forward provisions, with the bulk of the reductions taken at the postgraduate coursework level. Some institutions have larger numbers and proportions of HECS-funded postgraduate places than others, reflecting historical allocations. The policy of allowing cross-subsidisation, if continued in that context, would have given some universities a competitive advantage over others through historical accident.

Fee-paying postgraduate student numbers have grown by 8 540 EFTSU (53%) from 1997 to 24 680 EFTSU in 2000 and revenue has risen to $180 million. Institutional trends are variable. Margins are reported highest for MBA and related programmes and can be low for technological fields. Effective demand is strongest for business, computing, law and niche behavioural and health sciences where private rates of return are highest. Demand is weak for social professions such as teaching, nursing and social work. Some universities are headquartered in regions where fee-paying demand is generally soft. Several of these have opened up services in central business districts of capital cities in order to capture markets there. A number of universities now operate across State and Territory boundaries

Fee-paying domestic undergraduate student numbers have started to rise since the policy change of 1996 permitted them. In 1998, nine universities offered undergraduate courses on a fee-paying basis to 830 EFTSU. In 2000, the numbers have risen to fifteen universities and 2 850 EFTSU. Eighteen universities plan to offer these courses in 2003 and expect demand of some 5 000 EFTSU. Legislative provisions limit fee-paying students to no more than 25 per cent of enrolments in a course.

University revenue from **continuing education**[17] **fees and charges** grew by $24 million (53%) from 1992 to 1998. For most institutions the level of activity appears low and surprisingly so, given the importance of lifelong learning and the potential for raising discretionary revenue. Only seven universities increased their revenue from this source over the period and twelve appear to have reduced their activity. However, several institutions conduct this business through their commercial arms. Deakin Australia, the largest player, has some 60 000 award and non-award student enrolments in Australia and overseas. It works with its corporate clients to design, develop and deliver customised training, including generic courses and specific programmes.

Investment income (see Table 4) has not been a stable source of revenue growth for the sector. Only a few universities have investment income representing more than 5 per cent of their total revenue (mostly older institutions that received large

[17] Usually non-award courses offered for professional skills upgrading, workplace training or general studies.

endowments) and even for them the flows can be volatile year on year. A number of institutions are constrained by the State legislation by which they are constituted from investing in other than specified activities (e.g. property) and cannot legally invest, for instance, in spin-out companies. State and Local government constraints also apply to sale and change of use of university land.[18] Pressures are now building for some universities as a result of enterprise bargaining deals that conceded salary increases beyond the affordability limits of their operating accounts. Some have been drawing on their investment pools in recent times, so reducing return flows.

Table 4 Investment income for the higher education sector, 1992–98

	Investment income ($m)	Proportion of total income (%)
1992	212.2	3.6
1993	220.2	3.4
1994	129.6	1.9
1995	305.0	4.0
1996	298.2	3.7
1997	326.4	4.0
1998	289.6	3.4

Source: DETYA, Selected Higher Education Finance Statistics, various issues

Income from Donations and Bequests (see Table 5) has also been lumpy and low. There appears to be room for universities to increase their revenue from these sources, despite Australia purportedly having through its convict colony origins a limited philanthropic culture. Income from donations and bequests is frequently tied to specific purposes or activities or organisational units and is rarely available to the university to use at its discretion, and often requires some matching contribution from the university and/or other parties. In recent years many universities have been working to develop their alumni networks and more actively fund-raise. Several are seeking to intensify their connections with their regional communities and demonstrate the value of the university as a basis for attracting financial and other forms of support. The new formulae for allocating research infrastructure and scholarships will include donations and bequests for research within the eligible sources of research income, as an incentive for institutions to attract it.

[18] Land ownership varies among universities and within a single university there may be a combination of university-owned (freehold) land, Crown (State-owned) land, Land held in Trust, private land and leased land. State Government approval is required when Crown land and, in some cases, university-owned land, is to be sold. Land development proposals are normally subject to Local Government approval processes.

Table 5 Income for Higher Education from Donations and Bequests, 1992–98

	Donations and Bequests ($m)	Share of Total Income (%)
1992	107.9	1.8
1993	100.9	1.6
1994	65.5	1.0
1995	85.3	1.1
1996	84.3	1.0
1997	102.5	1.2
1998	114.6	1.4

Source: DETYA, Selected Higher Education Finance Statistics, various issues

Another component of 'earned income' is that which a university receives on the basis of its research capability. On a sector-wide basis (see Table 6), all categories of **research income**[19] grew by $260 million (42%) from 1994 to 1999. There has been steady growth in Industry and Other (Category 3) funding over the period, up by $100 million (54%). Category 3 funding as a proportion of all categories funding has not grown steadily but has shown an overall upward trend, being slightly higher in 1999 (32.5%) than in 1994 (30%). So although industry funding has grown significantly, it has grown only a little faster than overall research income. Equalisation of weightings for Industry income in the new allocative formulae[20] for research student scholarships and research infrastructure block grants should provide greater incentive for universities to attract funding from industry. Some universities have grown their industry funding significantly over the period. However for others, not only have their shares of national industry funding declined but their actual research income from industry has fallen. The proportion of universities' research income, which comes from industry in 1999, represented more than 40 per cent for nine institutions and less than 20 per cent for eight institutions.

[19] Category 1 includes national competitive (peer-reviewed) grants for research. Category 2 includes other public sector funding for research. Category 3 includes Industry and other funding for research.
[20] Category 1 funds receive a weight of 2 and Categories 2 and 3 a weight of 1 in the current Composite Index.

Table 6 Competitive funding for higher education research, Australia, 1994–99

	Categories 1, 2 and 3 ($m)	Income from Controlled Entities as a % of 1, 2 and 3 (%)	Category 3 Income ($m)	Category 3 as a % of 1,2 and 3 (%)	CRC Income ($m)
1994	624.5	8.6	187.3	30.0	32.4
1995	670.1	7.7	209.8	31.3	42.9
1996	720.6	6.5	219.6	30.5	46.6
1997	804.9	5.8	260.1	32.3	48.1
1998	819.1	6.1	271.2	33.1	47.0
1999	884.9	5.9	287.9	32.5	43.5

Source: DETYA, Composite Index data base, various years

Revenue from **consultancy services fees and charges and academics' Paid Outside Work** is not consistently reported and is a vexed issue at present within the universities. The involvement of academic staff in paid outside work (POW) has captured the attention of State audit offices in recent years (Office of the Auditor General, Western Australia , 1994; Audit Office of New South Wales, 1999).

The nature of POW that academics might engage in varies according to the relationship between the academic and the external client. Where a university enters a contract with a client, either through a school or department or faculty or university company, the relationship is between the university and the client, and academics have no separate contractual relationship with the client. Where an academic engages in private paid outside work, such as consulting or teaching, selling his or her services at market rates, the client's contractual relationship is with the individual academic and not the university. This is the area identified by the auditors to be at greatest financial risk.

The universities charge a management fee as consideration for the overhead costs associated with POW. Such levies vary across institutions from 12.5 per cent to 25 per cent. A central component of the levy is typically taken off the top and a share is passed to the faculty. Individual staff shares, after project-specific costs have been paid, are normally placed in a Special Account which can be accessed by the contributor(s) for work-related purposes, such as for attending a conference. Where an individual staff member receives personal income, the normal taxation provisions apply.

Most universities allow academic staff to engage in POW during their normal work time up to a specified time limit, typically one day per week or 13 days per quarter (staff may exceed this limit over short periods so long as their average for the year meets the guidelines). However, as much of an academic's paid work activities can take place away from university premises and no procedures yet exist for monitoring academic time at task, there are inherent problems in monitoring compliance with time-based activities. Some universities have moved away from the

one-day-a-week policy and are addressing the issue through their performance management arrangements with Deans of Faculties and Heads of Schools. The Western Australian auditors suggested that universities may be better served:

> *… by a shift in focus (from time monitoring) to output based measures whereby appropriate levels of service to the university are established as a standard measure against which output can be compared.*
>
> (Office of the Auditor General, Western Australia, 1994, p. 47)

The NSW auditors proposed a checklist for identifying good practice in universities' policies for and management of paid outside work:

- *The University's POW policy has been recently issued.*
- *The policy contains evidence of recent review or includes review mechanisms and timeframes.*
- *The policy states the types of POW allowed to academics.*
- *The policy sets a time limit for academics engaging in POW and/or specifies other methods of monitoring POW activities.*
- *Academics are required to advise the university before starting POW activities.*
- *The policy contains procedures for approving POW.*
- *The policy states the circumstances where activities are exempt from approval procedures.*
- *The policy unambiguously states whether the use of university resources is allowed for POW activities.*
- *The policy provides guidelines on allowable usage of university resources for private POW activities.*
- *The policy requires a statement from the academic that the University is not involved in private POW activities.*
- *Academics must submit evidence that the above statement has been provided to clients for each private POW activity.*
- *Procedures require academics to have adequate insurance coverage before engaging on POW activities.*
- *Evidence is required that academics have adequate insurance coverage if engaging in private POW activities.*
- *Academics have the option of engaging in university-sponsored POW.*
- *The policy contains requirements for academics to report their private POW activities to the university on a periodic basis.*
- *The policy contains a statement that disciplinary measures will be taken in instances of non-compliance.*

  (Office of the Auditor General, Western Australia, 1994)

Universities in NSW are now reviewing their policies and practices with regard to paid outside work. The introduction nationally of a Goods and Services Tax (GST) in 2000 is also likely to flush out more of the scale of academics' paid outside activities which have so far been under-reported.[21] Similarly, a tightening of

[21] A person requires an Australian Business Number in order to claim input tax credits for services where annual turnover is $50 000 or more.

university policies regarding the conditions under which academics will have protection under professional indemnity insurance, and the costs involved for academics in buying their own cover, is likely to see an increased proportion of consulting work put through the university's commercial arm.

Aggregate revenue for the sector grew by $2.03 billion (30%) over the period 1994 to 1999. However, expenditure rose by $2.16 billion (33%) over the same period, resulting in a declining surplus (see Table 7). Stated in other ways, the operating 'safety margin' (surplus divided by revenue) deteriorated from 6.6 per cent to 3.3 per cent over the period. While the operating surplus has been declining, the external borrowings have more than doubled, increasing from $141 million to $346 million during the period. The 'current ratio' (current assets divided by current liabilities) also fell from 1.88 to 1.83, signalling tightening liquidity.

Table 7 Financial measures and ratios for higher education institutions, Australia, 1994–99

	1994 ($m)	1995 ($m)	1996 ($m)	1997 ($m)	1998 ($m)	1999 ($m)
Financial Measures and Ratios						
Safety Margin (%)	6.1	6.9	5.9	6.5	4.6	3.3
Current Ratio	1.88	2.00	2.04	1.99	1.85	1.83
Aggregate Revenue and Expenditure						
Revenue ($b)	6.88	7.584	8.12	8.33	8.76	8.91
Expenditure ($b)	6.46	7.06	7.64	7.79	8.35	8.60
Surplus ($b)	0.42	0.53	0.48	0.54	0.41	0.29
External Borrowings and Debt Equity Ratios						
Borrowings ($m)	141.3	173.7	266.9	276.1	318.5	346.2
Debt Equity Ratio	0.02	0.02	0.03	0.03	0.02	0.02
External Borrowings and Debt Equity Ratios						
Cash & Investments ($b)	3.1	3.4	3.6	4.0	4.6	4.0

Source: DETYA analysis of institutions' audited Financial Statements

3. The university as enterprise

With currently a third of university revenue on average dependent on 'earned income' that is hard to win, that can be volatile and uncertain, that costs funds to earn and when earned may be available for use only in designated activities, with little discretion for the university at large, the tasks of university management become more complex and require new skills, systems and cultures. For all the effort that universities have been making to grow their earned income, the impact on the bottom line for many is apparently adding little if at all to surpluses.[22] In the context of rising competition, and policy and financing frameworks that have a differentiating impact on institutions, the business of revenue raising and cost management requires a more serious strategic approach.[23] So too does the management of culture and relationships.

On the basis of publicly reported performance information, quality of internal planning and monitoring processes, and available documentation, together with observations over the past decade, there is great variability in the management strategies and capabilities of universities.[24] These differences relate to what have been generally regarded as 'core' functions of teaching, research and community service and to administrative functions. Some of the latter are blurring with 'core' functions in several respects and constitute aspects of competitive advantage for some institutions, whereas other administratively and previously regarded-to-be 'core' functions are becoming contestable as between in-house or external provision.

There are discernible 'leaders' and 'learners' in respect of capabilities for instructional design and delivery (though some promote generic capability and others argue for field-specific and method-specific references) (McNaught, 1999). Several universities have web-based processes for student enrolment, course selection and timetabling, access to study materials and facilities, submission of assignments, feedback from tutors and lecturers, interaction with fellow students, access to results, advisory services and e-business transactions. A couple have well-labelled, digitised content capable of modularisation for use in a variety of products and services with partner organisations and multiple technologies.

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[22] One university has estimated that it costs, on average across its commercial activities, 92 cents to earn one dollar. There are also salary, infrastructure and on-costs for universities whose staff win competitive grants for research, and government and industry-funded collaborative research centres.

[23] See for instance, Gibson, D. et al., *Performance and Client Service in a Competitive and Rapidly Changing Environment: Queensland University of Technology*; Higher Education Division, DETYA, Occasional Papers Series, 99–C, 1999. (www.detya.gov.au/archive/highered/occpaper/99C/default.htm)

[24] See for instance: *The Characteristics and Performance of Higher Education Institutions*. Higher Education Division, DETYA, 1998a; *The Quality of Australian Higher Education*, Higher Education Division, DETYA, 1999; McKinnon, K.R., Walker. S.H. & Davis. S. 2000, *Benchmarking: a manual for Australian universities,* Higher Education Division, DETYA; Hoare, D. et al. 1995, *Higher Education Management Review; Report of the Committee of Inquiry*, AGPS. Canberra; Yetton, P. & Associates 1997, *Managing the Introduction of Technology in the Delivery and Administration of Higher Education*, Higher Education Division, DETYA, EIP Series 97/3; Cripps, D., Yencken, J., Coghlan, J., Anderson, D., & Spiller, M. 1999, *University Research: Technology Transfer and Commercialisation Practices,* Australian Research Council, Canberra.

There are also 'pace-setters' and 'followers' in respect of planning and budgeting, knowledge management, assets management and space utilisation, business planning, financial and risk management, people management, student services management, research commercialisation, international strategy formation and negotiation, marketing and delivery, and relationships management. Several universities are adopting a strategic approach to cost reduction and revenue generation, basing their decisions on serious assessments of their competitive strengths.[25] Some others have been taking a less-focused approach, top-slicing all areas for cost-cutting purposes, randomly offering redundancy packages to staff, and embarking on revenue raising activities with little comparative advantage.

Some have developed internal resource allocation policies which reward earned income and give incentives to Faculties and Departments to take their own initiatives while ensuring an adequate institutional share for the general purposes of the university. Others have adopted internal 'socialisation' approaches to redistributing earned income in such a way that the mettlesome feel robbed and the mendicant are shielded from identifying new opportunities and practices. Where leadership is weak and corporate policy unclear, there are signs of balkanisation within the university. On the one hand, the aggressive external earners defy central limitations on their behaviour, resent any reporting, avoid putting their consultancies through the university's commercial arm, refuse to pay for university overheads, evade institutional approval requirements, and put their time into those activities which provide private returns rather than contribute to the university-wide good. On the other hand, those who cannot see themselves benefiting from university-wide developments reject the validity and appropriateness of commercial activities within the university and become active in creating institutional procedures to discourage and undermine them.

There are also some systemic deficiencies relating to knowledge of costs and management of cost drivers, cumbersome governance structures and procedures, and inflexible industrial arrangements (Hoare et al., 1995; Anderson, 1999). The committee established in 1995 to review institutional governance and management concluded that universities were not giving adequate attention to equipping people in management positions with the skills needed to manage change, people and risk in an increasingly commercial and competitive environment. Nor were they seen to be coming to grips with the emerging need for more flexible workplaces and work practices (Hoare et al., 1995).

In 1999 the Commonwealth Government provided additional funds for a once-off supplementation to the base level of university operating grants sufficient to pay for an additional 2 per cent rise in academic and general staff salaries.[26] This supplementation was made available on a voluntary basis to universities on the condition that they met a set of broad criteria, in ways accommodating their specific enterprise circumstance, for improving their management, administration and workplace relations. The Government's aim was to unlock rigidities within institutions and enable greater flexibility in course offerings and innovation in the

[25] For a case study of one approach see Kemmis, S. & Maconachie, D. 1998, *Strategic Repositioning: Identifying Areas for Future Investment; a case study of rapid change at the University of Ballarat*, Occasional Paper Series, Higher Education Division, DETYA.

[26] The 2 per cent supplementation for salaries is additional to the annual indexation of staff salaries by a Safety Net Adjustment factor (1.9 per cent in 2000).

delivery of education services. An initial grant is payable to a university once they have a certified agreement with staff that satisfies any 9 of 14 criteria.[27] Confirmation of the grant for ongoing payment after twelve months is conditional on the university's achievements in implementing the initiatives set out in its initial application for funding.

Among the criteria for payment of the supplementation, as well as various industrial relations flexibilities, are initiatives promoting cost savings, discretionary revenue generation and productivity gains and performance management. There is also a set of management and administration improvement initiatives, including sharing of educational and administrative services, more flexible operating times and better use of staff and physical resources, and rationalisation of governance structures. Several universities have been granted the initial payment on the basis of their certified agreements and other proposed reforms.

The final report (Ernst & Young, 1998a) of a study to develop a costing methodology for use by universities reported, on the basis of site visits, survey responses, workshops and consultations that Australian universities lacked a basic knowledge of their cost structures and cost drivers required for sound financial management and for pricing decisions and negotiations. In the increasingly competitive environment both domestically and internationally, in respect of education and consulting services, and research and commercialisation of IP, universities were found to be deficient on their knowledge of costs:

> *The current state of cost management in most universities is not adequate to support the needs of their businesses and the changing landscape. Information has been developed in a vacuum within institutional silos using inconsistent practices and less than credible numbers.*
>
> (Ernst & Young, 1998b)

The tightening liquidity position for many universities, the toughening of competition in both domestic and overseas markets and the need to raise external income to fund the salary rises they have agreed to pay their academic and general staff are, together, causing a greater concentration on enterprise management. A more purposeful approach is becoming evident among the best managed universities. This involves variously, more rigorously assessing the performance of academic and service organisation units against quantitative and qualitative benchmarks; establishing activity-based costing and full-cost, accrual-based reporting; introducing internal user charging for services and 'trading' of teaching effort between Faculties; reviewing the opportunity costs of assets and exploring alternative financing and leveraging mechanisms; reconsidering forms of hiring, particularly for staff with expertise that is of high value in the market; and investigating options for collaboration through shared service arrangements, including common purchasing and contracting-out arrangements. In several instances, these new management approaches are supported by substantial investments in new management information systems, which also enable better integration of student activity information and improved student service, hence improving competitive advantage.

[27] www.detya.gov.au/highered/programmes/workplace_reform/default.htm

4. The university as developer of graduate attributes

All publicly funded Australian universities have been required since 1998 to have specified their graduate attributes[28] in the Quality Assurance and Improvement Plans which are submitted to DETYA as part of the annual University Profiles process and subsequently published (DETYA, 1999). The public policy intent has been to focus on the outcomes of university functions, as distinct from an historical preoccupation with inputs and processes or quantitative graduate outputs (student completions). Work on identifying generic capabilities or skills had begun in the early nineties in several universities.

There has been some variation in the way universities have scoped their graduate attributes, with some focusing on employment-related skills and placing little importance on social or cultural attributes, and others focusing on what might be described as the cognitive aspect of a skill at the expense of any application of that skill. Some universities have clustered a number of attributes under a smaller number of broader headings (e.g. Queensland University of Technology – Knowledge/Problem solving; Ethical/Attitudinal; and Social/Recreational; University of Western Sydney – Disciplinary skills; Generic Practical, Analytic and Knowledge Skills; Personal Skills and Attributes; Australian Catholic University – Intellectual, Professional, Values). Other universities have arrived at lists of varying lengths (e.g. Australian National University – 7; James Cook University – 9; The University of Queensland – 12). Gradually these lists have become more refined as universities have revisited their original efforts and attempted to build into their public statements evidence of the extent to which the curriculum actually addresses the attributes nominated.

The first stage in the development of graduate attributes was essentially rhetorical, as universities made explicit statements valuing such capabilities. Many Australian universities are now, however, working towards embedding their lists of graduate attributes into the curricula and then developing strategies and systems for assessing and recording outcomes. This task requires considerable commitment from the full range of university staff, from senior administrators to individual academics.

In many institutions, an early (and in some instances continuing) stage in the embedding or integration process has been to devise and conduct a graduate or

[28] Graduate attributes are sets of generic capabilities which have been identified by universities as those which are desirable for all of their graduates to possess by the end of their university learning experience, irrespective of the field of study of the degree they have been awarded. There has been considerable confusion in the use of terms in this area, with outcomes, attributes and skills used interchangeably in some instances and distinctly in others. In the UK, there has been a general adoption of the use of 'attribute' rather than 'skills', in an effort to register a broader notion of 'graduateness' so that it encompasses knowledge, understanding, dispositions, attitudes and values, as well as skills. In Australia, the debate about terminology has been complicated as the development of graduate attributes has shadowed the development and adoption of the 'key competencies' within the vocational education sector that are seen to be too narrowly cast for higher education.

generic skills survey to attempt to measure student (and sometimes staff and employer) perceptions of the development of generic skills in the students' learning experience. This may be undertaken at the institutional level, for example, the University of Western Australia Careers Advisory Board survey of the development of generic skills in 1995 and Curtin University of Technology's Graduate Attributes Survey (administered annually since 1996); or at a course, programme or subject level.

The next stage towards embedding graduate attributes in the curriculum involves an audit or mapping of the curriculum, to determine where graduate attributes are being currently addressed or developed within a particular course. The audit process requires academics to look beyond the stated objectives of a course, because whilst a course may have the stated objective of fostering, for example team-work, this attribute may not be manifest in any of the teaching or learning processes in the course. Integral to this is an examination of what attributes/skills are assessed in the course as it is not possible to recognise such attributes as outcomes of a course unless they are assessed either formatively or summatively. The audit provides the framework for strategic decisions to be made about which attributes require further attention in terms of integration, development and assessment. A profile or summary is normally generated as a result of the audit process.

Whereas all Australian universities have embraced the specification of graduate attributes, the comprehensive integration of those attributes into the curriculum so as to ensure specific graduate outcomes, has been adopted with varied enthusiasm and commitment, with a number of institutions standing out as leaders. The Australian Technology Network (ATN) universities have made a concerted commitment to the development and integration of graduate attributes. The ATN universities also collaborated in a joint research project with the recruitment company Morgan and Banks, to investigate graduate attributes, with a particular focus on incorporating employer expectations. In 1998 DETYA funded a two-year study by the ATN. The Government's policy interest was to enhance the exercise of student choice by helping universities to develop a commitment to and methods for increasing the individual graduate's post-university prospects.

The report of that project in relation to 'generic capabilities' (attributes that go beyond disciplinary expertise or technical knowledge) identified the following principles relating to curriculum development, teaching practices, learning experiences and assessment:

- *Desirable capabilities are most usefully formulated at both university and course level.*
- *The development, practice and assessment of capabilities are most effectively achieved within the context of discipline knowledge.*
- *Exposure to, and reflection on, a variety of teaching approaches and learning experiences fosters a focal awareness of capability development.*
- *Assessment practices should align with course/subject goals and teaching/learning practice.*
- *A package for assessing generic capabilities incorporates items designed for a range of purposes.*
- *Students benefit from progressive feedback on the development of capabilities.*

(Bowden, J., 2000)

While the above principles may sound innocuous their import is far-reaching. The report sets these principles in the context of the 'paradigm shift' that has occurred in curriculum design, development and implementation, with the move to student-based, outcomes-based or problem-based learning. Professional bodies, such as the Institution of Engineers, Australia, have taken steps to ensure that educational programmes demonstrate and appropriate balance between technical competency and generic capabilities such as teamwork, leadership, effective communication, critical thinking, problem solving, creativity and ethical practice (Bowden, 2000, p. 30).

The integration of graduate attributes at an institutional level is evident in the approach taken by the University of Newcastle. It has adopted as a broad University goal to 'develop graduates whose knowledge, skills, abilities and attitudes are highly valued in the workplace and broader community'. It has then adopted a strategy and a key performance indicator for this goal, the indicator being the 'number of courses with features which incorporate core skills, abilities and attitudes valued in the workplace and broader community'. Since 1998, through the establishment of its Core Skills and Graduate Outcomes Project Group, the University of Newcastle has embarked on a concerted programme to foster the integration of core skills into the curriculum.

The University of Wollongong has couched its approach to graduate attributes in terms of 'tertiary literacies', and initiated a number of projects to develop the full range of literacies in relation to specified responsibilities to ensure, for example, that every Wollongong graduate is IT literate. The University of Canberra is currently reviewing its academic programme and paying particular attention to the need to ensure the development of generic skills. One of the recommendations of the review will be for the University to actively encourage students to undertake double degrees which combine generalist and specialist courses, so that professional capabilities are complemented by a structured generalist education.

No Australian university has to this point adopted the holistic approach of Alverno College in the United States, which has developed a university-wide strategy for curriculum integration and assessment focused on eight specific abilities. The University of South Australia is arguably, however, the closest to this institutional model having worked since 1995 to integrate its seven graduate attributes within its quality assurance and improvement process.[29]

4.1 Graduate attributes/outcomes as a quality issue

Increasingly in Australia, universities are using achievements in relation to graduate attributes as indicators of the quality of teaching and learning outcomes. Graduates are invited to respond to the Course Experience Questionnaire (CEQ) in the year after their graduation. This instrument has been administered by the Graduate Careers Council of Australia on a nationwide basis for seven years. It uses as one of its indicators the degree to which students believe that their course has improved their generic skills. These data are published in terms of findings by broad field of study and by institution. A new set of scales for the CEQ is under consideration.

[29] See a useful guide *Developing the qualities of a University of South Australia graduate: Guide to writing course and subject documents* (www.unisa.edu.au/usainfo/gqguide.htm)

These include student support, learning resources, learning community, graduate qualities and intellectual motivation. A Postgraduate Research Experience Questionnaire has also been trialled.

Some difference of views have emerged in the process of developing these instruments and reporting on their results. A few universities, or groups within them, prefer to confine the use of graduate feedback to internal purposes and argue that the methods of data collection and responses do not validly permit their use for broader purposes. On the other hand, the Government, noting that the statisticians agree to disagree, prefers more public disclosure in the interests of public accountability, informing student choice and generally signalling the importance of responsiveness to student needs and student satisfaction as an important dimension of quality higher education.

In October 2000 a national Graduate Skills Assessment (GSA) test will be offered for the first time. This voluntary test, developed by the Australian Council for Educational Research with DETYA funding, will be available to students in their first and final years of university. Four generic skills will initially be tested by the GSA—critical thinking, problem-solving, interpersonal understandings and written communication. It is an initiative that is aimed at providing students, universities and employers with more information about a set of graduate attributes, whether for the purposes of monitoring value added by the university experience or reinforcing a job applicant's claims. Again, this is an initiative with mixed receptions from some parts of the higher education sector. Some suggest that the very existence of such a test will cause university courses to focus on what is being tested. However, given the generic nature of the skills being tested it is difficult to see how courses would be narrowed even if they were aligned to those skill sets; they are more likely to be deepened and broadened through a focus on such outcomes.

The findings of a 1999 survey of employer satisfaction with graduate skills (AC Nielson Research Services, 2000) reinforces the need to focus on learning outcomes and generic skills. Employers were found to discriminate in their hiring practices mainly on the basis of graduate capacity for independent and critical thinking but also found inadequate written communication and interpersonal skills and a lack of understanding of business practices. With regard to those they did recruit, the greatest skill deficiencies among new graduates were seen to be in the areas of creativity and flair, oral business communication and problem solving.

4.2 Enterprise education

Increasing recognition is being given by Australian universities to the teaching of 'entrepreneurship' and 'innovation'. The predominant focus appears to be that of commercialisation in economics/commerce, business and marketing, and to a lesser but growing extent in engineering, ICT, agriculture and science programmes to help students develop their skills for business management and for product and technology commercialisation.

A range of options are available to students, including full programmes, and individual modules and courses within existing programmes of study. For example a Graduate Certificate, Diploma and Master of Entrepreneurship and Innovation are offered by Swinburne University of Technology, and Southern Cross University has a one-year full time MBA which provides a specialisation in 'Entrepreneurship and Small Enterprise Management'.

For most universities however, courses or modules on 'entrepreneurship' or 'innovation' are embedded in existing programmes. For example, the University of Queensland offers a one semester course in 'Entrepreneurship and New Venture Creation' within the Graduate Management Program. The University of Western Sydney offers a summer course through the School of Business and Industry Operations Management on 'Innovation and Entrepreneurship'.

Generally universities are thinking more creatively about enterprise education. The University of Canberra has established the 'UC Innovation Centre' designed to enable students to advance their qualifications and careers in a business environment involving 'productive partnerships'. Swinburne University of Technology has a comprehensive approach to enterprise education, including embedding industry-based learning in the curricula, involving assessable units learned in workplace settings. A different approach has been taken by the Melbourne Business School which has a number of non-award entrepreneurship initiatives including Melbourne University's 'Entrepreneurs' Challenge' which provides an opportunity for members of the Melbourne University community to learn about new venture creation and to develop and test their ideas and plans for new businesses and presentations on e-Ventures and e-Commerce.

The ATN universities are collaborating in the production of a set of five interactive on-line modules for developing the generic skills of research degree students, including: project/financial management; entrepreneurship; leadership and communication; technological/commercial development; and public policy. These modules are to be supported by self-assessment exercises, on-line discussion forums and structured workshops.

5. The university as contributor to innovation

A 1983 report (Australian Academy of Technological Sciences, 1983) identified industry-academic links as a key factor in developing Australian innovation but found them then deficient. A systematic study a decade later found that university-industry links tend to be formed and maintained as a complex web of varying relationships rather as a sequential chain of contacts:

Research links tend to develop from contacts through a range of activities such as teaching and the supervision of postgraduate research students, secondments or staff exchanges between university and industry, fee for service arrangements and testing facilities in universities. A range of activities in the web of links was seen to be important, since each has some benefit and can also be the basis for the development of further links. Contracts with either industry or government agencies, for example, were seen by university personnel as the most common form of links and to be of greater significance in both creating and applying new knowledge than consultancies, in which greater emphasis is placed on applying existing knowledge. Consultancies, however, provide through both formal and informal means, a continuing fabric of relationships between individual academics and their potential contracting environments. Collaborative relations, such as working in teams drawn from both universities and industry were seen as critical in building mutual understandings and longer-term relations (National Board of Employment Education and Training, Report 26, 1993).

A subsequent report in 1995 (National Board of Employment Education and Training, Report 36, 1995) concluded that basic research and academic research generally are coming into closer interaction with technology development. It found that many different disciplines and kinds of knowledge (explicit and tacit) are involved, and knowing how to connect and organise them is crucial.[30] The dynamic of technology development was seen to be changing the way that academic research is structured. The majority of research findings are being published across disciplinary boundaries and multidisciplinary centres may account for half of Australia's higher education research effort.

The second part of that study (National Board of Employment, Education and Training, Report 37, 1996) reported that because of the multi-type complexity of today's knowledge in many leading edge scientific fields, it is now relatively meaningless to distinguish between basic and applied research; the basic research problem is now set within industrial application interests and parameters; and many of the long term and formal cooperative arrangements between universities and industry reflect these changes and, increasingly, links are being built around a

[30] Australia's economic structure differs from those of the United States and the advanced nations of Europe, not only in terms of scale and industrial activity, but also in that multinational corporations are rarely headquartered and conduct little of their R&D in Australia.

combination of training, research and technical testing and other such service provisions.[31]

That report also drew attention to three major developments relating to commercial application of academic research: science and technology parks; university companies; and cooperative research centres. **Science and technology parks** were designed to promote linkages with industry and commercial returns. Universities, often with the support of State governments, have dedicated land and provided infrastructure for science and technology parks and related property developments. The general experience has been that it takes at least seven years for a park to become effectively established and operating solvently in Australia, with success depending heavily on the capability of the chief executive. While these parks may incubate start-up companies that have commercial success their contributions to regional economic development have tended to be more symbolic than real, with the main interest of many being the aspect of property development.

The **university company or commercial arm**, which proliferated in the early 1980s, was generally given the functions of managing university-industry links, arranging the provision of fee-paying courses, promoting commercialisation of research, managing intellectual property and providing support for spin-off companies.[32] The commercial arm could intervene directly between academic researchers and the market. Incentives were often offered to attract academics to work though the university company rather than make their connections through their faculties or departments as university business. The experience with university companies at the time raised issues of conflict of commercial with academic ethos:

> *University researchers who work there are able to suspend the traditional salary levels and entitlements of academic work in favour of earning an unlimited income based on percentage of revenue generated. There is a thick layer of upper-level managers, largely drawn from corporate and administrative backgrounds, on incomes higher than professors, and all subject to immediate dismissal if performance fails. The cries of anger and anguish from the faculty sector are increasingly trenchant. Partly justified, partly projected, they see university moneys crossing the organisational divide from faculty to commercial sector of the institution and being soaked up into an enterprise that some identify as the total antithesis of academic values.*
>
> (Hill & Turpin, 1994)

[31] Some fields, such as mathematics, humanities and social sciences, are particularly dependent on general university funding. Others, such as applied sciences and technology, and agricultural sciences, are more dependent on specific research funding schemes of various federal and state government agencies. In engineering and the information sciences the business sector plays a greater role. Medical and life sciences and fields such as Chemistry, are more dependent on national competitive grants through the research funding councils.

[32] The commercialisation options available to researchers and research organisations have been described in the following terms: (a) corporate deal through either licensing to an established company, or through a joint venture with an established company; or (b) start-up company funded by debt, or a Government start-up assistance grant, or seed capital from a business angel, or loan capital, or private stock offering, or equity investment by a corporation, or by venture capital financing, or high risk financing or development capital/mezzanine funding, or through the public market. Mitchell, G. & Nossal, G. 'Funding options for research: facing the market as well as government', *International Journal of Parasitology*, 1999.

With a view to encouraging and formalising collaborative research links between universities, government research agencies and industry, the Commonwealth instituted the **Cooperative Research Centres** (CRCs) programme in 1990. By 1996 there had been 61 CRCs established over four rounds of applications. The successful CRCs generally receive federal Government grants of some $2 million for seven years. Total commitments amounted to $2.2 billion, with $690m from the Government, $350m from industry, $400m from CSIRO and $590m from universities. Currently there are 65 CRCs. Evaluations of CRC operations have generally rated them as very effective (some more than others), changing the way research is conducted in Australia and changing the way the public and private sectors perceive each other and conduct business with each other. The following impacts have been noted

- *The focus of research has shifted in CRCs from traditional departmental and discipline boundaries to multi-disciplinary, collaborative areas;*
- *The establishment of CRCs has introduced a process of selectivity for preferred areas of research, with state-of-the-art resources being accumulated around groups of people;*
- *Different public sector bodies are being challenged by the impact of collaboration with each others' cultures and those of the private sector, and while this will develop business skills and an entrepreneurial spirit in the academic community, it is necessary to address issues such as the right to publish and the traditions of academic freedom;*
- *The CRC programme has drawn State governments into the research funding arena through the perceived economic advantages and the attractiveness of being home to major, internationally prestigious research centres;*
- *The CRC programme has acted as a powerful vanguard in the transformation of the university system, displacing the culture and values of the lone researcher with a couple of students engaged in the fascinating challenge of curiosity-oriented research by a purposefully managed and directed interactive research process, designed to produce knowledge of value and applicability to the potential users.*

(National Board of Employment, Education and Training , Report 47, 1996)

A cultural divide was seen to be arising in the mid-1990s through the experience of science and technology parks, university companies and CRCs:

> *There is thus being played out a major struggle over the appropriate culture for Australian university research. Many are whole-heartedly committed to the strong orientation of this research to addressing Australia's serious economic and social challenges, and see the CRCs and other focused, application-oriented mechanisms as the harbingers of a new and effective dawn for Australian science. Others resent and resist the intrusion of commercial values into the university arena and the steady loss of independence and autonomy.*
>
> (National Board of Employment, Education and Training , Report 47, 1996)

Australian academics were seen to be straddling this divide somewhat uncomfortably: on the one hand concerned with the generation and transfer of new knowledge through their research and teaching; and on the other hand being encouraged to secure and maintain market niches for selling that knowledge. The two work domains were seen to have different sets of objectives, different ways of measuring success, different reward criteria, different modes of communication, and different forms of symbolic capital, supported by different forms of legitimating authority (Turpin & Hill, 1995).

It does appear, however, that there has been an evolution in approaches to deal with this cultural divide. Three discernible, and possibly overlapping phases can be identified: an *individualistic* phase, largely driven by the objectives of individual researchers and shaped by their network of industry contacts; a phase *managed through controlled entities*—commercial arms, established by universities to manage and promote linkages with industry and obtain commercial return on intellectual property, functioning largely as a centralised broker service, at arms length from mainstream university activities; and a *core business* phase, where industry links are a major strategic consideration in university planning and management, with relationships negotiated at Vice-Chancellor level but operations decentralised to Faculty, School or research group. This trend to more formalised and structured arrangements for managing cooperation is leading to new organisational forms that rely on the integration of research, training and technical cooperation (National Board of Employment, Education and Training, Report 47, 1996).

A 1999 study of the technology transfer and research commercialisation (TT&C) practices of Australian universities (Australian Research Council, Report 60, 1999) found user dissatisfaction with university performance. Users of research found the TT&C performance of universities highly variable, both between universities and within the one university. Most survey respondents reported that when they approached universities without having a specific person to contact, they had difficulty obtaining the expertise they were seeking. Universities generally were seen to have no up-to-date knowledge in one central place about their researchers' competencies. University companies were not always seen by users to be helpful during the contract negotiation process. Concerns were also raised about the failure of universities to meet agreed deadlines and produce the agreed research outputs. While the leading universities were seen to have appropriate skills and experience in negotiating and supporting relationships involving consultancies, research contracts and IP licensing, they were seen to have much less competence and experience in facilitating new venture creation and survival. Users involved with spin-off businesses found a serious shortage of people with experience in managing the technological development stage. Delays inherent in university decision-making processes about new equity investments were a serious problem for venture capitalists.

From the university perspective, earnings from external commercial relationships were found to be greatest for engineering, followed by biosciences and the physical sciences. Universities without engineering faculties appeared to have fewer opportunities for developing commercial relations. Universities were reported to be finding it difficult, in developing consultancy and external earnings policies, to strike a balance between protecting themselves against legal liabilities and maintaining flexibility in their external relations. Excessive control and internal levies on fees earned can be disincentives to researchers to build external commercial relationships. Independently-formed relations outside the indemnity insurance cover provided by a university can expose individual researchers to significant financial risk or impose inordinate costs on them. Universities were finding that success in maximising the value of IP, particularly through spin-off companies, requires access to a critical mass of specialist professional and management resources. Larger universities were seen to be more able than smaller ones to carry the costs and risks involved. Smaller universities were enjoined to group together with a shared university company or other agency to achieve the critical mass of competencies required.

The Intellectual Property policies of many Australian universities provide for deduction of expenses associated with commercialisation of the IP and then the distribution of the net income as follows: approximately 33.3 per cent to the researcher, 33.3 per cent to the faculty and 33.3 per cent to the University. A number of universities have a sliding scale of rewards whereby researchers may receive a larger proportion (between 50 per cent to 100 per cent) when the total net income is less than $100 000, and a lower proportion when the total net income exceeds $100 000 (Monotti, 2000).

Findings reported from a limited survey of university researcher involvement in commercialisation indicated that the most preferred commercialisation avenues are contract or collaborative research with an existing firm and consultancy work for an existing firm. The authors attributed this to the lower risk of dealing with known firms as compared to the risk of establishing start-up companies:

> *The data suggest that the avenues with the lowest risk-to-effort ratio are preferred. Technology transfer via research and consulting linkages is relatively risk-free and does not attract the 'overhead time', effort and stress that licensing arrangements, still less start-ups, tend to require.*
>
> (Matthews et al., 2000)

However, the responses given in the context of assuming the removal of current impediments suggest that these impediments limit new firm start-up activity (whether requiring or not requiring university equity), limit activity involving licensing IP via a direct deal with an existing firm, and limit joint ventures with existing firms, thus producing a thin rather than broad commercialisation profile.

In the field of information and communications technology, relatively fast to market opportunities arise. Australian scientists and technologists are capable, software product development is relatively low cost and, to the extent that a capital injection is needed to develop a technique from idea to market-ready, venture capitalists, whose time horizons for returns are normally between 12 and 18 months, may be prepared to invest. In the biosciences, where Australia has particular strengths, the regulatory regimens of the health and drug administrations and associated clinical trials are exceedingly complex and protracted, and therefore costly—for plant, animal and, especially human applications—returns are not likely to be realised within a decade, well beyond the normal period of venture capital investment. In the material sciences, the costs of prototype development can be prohibitive for local inventors. Rapid prototyping and simulation technologies are emerging in particular areas.33 Risks generally are high, with success being of the order of one in twenty ventures.

The available data on Australian universities' commercialisation of IP are patchy. By one estimate, Australian universities together have generated a dozen spin-offs per annum on average over the last decade (Thorburn, 2000). By another estimate for the period 1996–98 (for 18 Australian universities) there were on average, 15.2 inventions reported, 8.9 patent applications, 5.7 new patents awarded, 3.5 licences and options, and 12.8 current patents.[34] One in three business start-ups is reported to result directly from university research (Mathews et al., 2000).

[33] Stereolithography allows a product to be created using an ultra-violet curable liquid resin polymer and advanced laser technology (www.techok.com).

[34] *Australasian Tertiary Institutions Commercial Companies Association, 1998 Survey* (18 Australian Universities participating)

A recent study (Mathews et al., 2000) of institutional barriers to the involvement of university researchers in new business enterprises has highlighted a number of specific areas for improvement action. The study found that the problem lies not so much with the policies and procedures promulgated by universities in respect of researcher involvement but with their practices and competencies, alongside gaps in the availability of funds for advancing pre-competitive ('proof-of-concept') applications, and availability of researchers' time to engage in research commercialisation. The identified '*business process inefficiencies*' are attributed to the relatively recent growth of research commercialisation activity in Australian universities and the lack of cumulative experience in handling the complex processes involved:

> *across the university sector, regulations concerning research commercialisation are largely common. However, practice varies considerably. This can be largely attributed to different levels of expertise, the extent of encouragement for entrepreneurialism, and resources available to support research commercialisation.*
>
> (Mathews et al., 2000)

On the basis of our discussions with senior university personnel in Executive positions, and in Research Offices and commercial arms, a number of 'failures' have been identified from which useful learning has occurred. There is a considerable 'trial and error' dimension to current practice in many universities. The following six errors have been experienced by more than one university:

- poor 'spotting' or' 'scanning' of IP with commercialisable value, either through missed identification or lagged appreciation;
- premature extraction of research from the academic environment when time to commercial product was later assessed to involve at least five years;
- over-extension of risk on the part of the commercialising agency to a particular market segment or product range;
- deals arranged by managing directors of commercial arms that were not subject to proper scrutiny and executive approval;
- inadequate project monitoring and consolidated portfolio reporting; and
- naïve negotiation of rights and returns.

While there is some reluctance among the universities to share detailed information about their commercial operations there is accumulating a stock of 'know how' and 'know how not' from learning by doing. Directors of commercial arms, Deputy/Pro Vice-Chancellors responsible for research and international functions, as well as researchers active in the commercialisation arena, exchange views and monitor each other's progress. Reviews are underway in several universities regarding their policies and structures for managing the commercialisation of research. The next phase of development, building on the lessons of a decade of experience, can be expected to be more formalised and professionally risk managed.

6. The emergent university

The notion that new organisational forms are emerging for universities as they adapt to the changing environment arises from the development of seven new sets of influences on the established university form. Whereas Australian universities were founded as Institutions rather than formed out of Colleges, they have operated in many respects, some more than others, as relatively loose, internally federated organisations with the Faculties having various autonomies. And individual academics generally identify themselves first with their disciplines, then with their departments and last with their university. Much of the course of reform over the last two decades has involved a strengthening of the managerial core of universities relating to planning and budgeting, procedural policies for course approval and quality assurance, marketing, information systems development, conditions of employment and infrastructure provision. This trend has not been without its tensions, particularly in some institutions, from time to time. Now there are new factors at work that are likely to reshape the relations between what Burton Clark calls 'the steering core', 'the academic heartland' and 'the periphery' (Clark, 1998). These new relations will require new integrating mechanisms for university continuity.

First, **there is a multiplication of external agencies of government directly purchasing services from or providing specific-purpose funding to universities** such as for industry development, regional development, initiatives to fill particular labour market shortages, research into particular problems, and public policy advice. Each of the agencies in pursuing its particular interests may not only set performance standards or outcomes definitions for service delivery but may also impose conditions on universities, such as requiring matching contributions or restricting use of facilities, thereby requiring universities to dedicate parts of their resources to specific activities. These external push-pressures have a potentially atomising effect on the university organisation.

Second, **there are various pulls of market opportunities**: (a) university-wide opportunities for providing a range of services to a market; (b) faculty-related opportunities for providing a set of services to a market or to particular customers; and (c) individual/team opportunities for selling expertise to a market or to particular customers. The stronger the market pulls on individual academics or groups of academics in a Faculty or Centre the greater the pressures for organisational fragmentation. Kogan and Hanney have commented on this tendency in relation to the continuity of experience in the UK:

> *The demand that universities set themselves up to act in the market required them to act in a contra-academic manner, by seeking pecuniary gains rather than seeking the truth disinterestedly, and taking as much time and care in doing so as is necessary. But market behaviour is not far different from the competitiveness which has always informed academics. The sale of expertise reinforces the power of academics at the base of the system. Competitiveness has always been part of the process by which academics acquire reputations and the benefits that flow from them. The difference is that individuals can now make money, and*

> *departments become more independent of their universities as a result. Academics moving into market operations have, however, to develop different networks and expertise for working in them.*
>
> (Kogan & Hanney, 2000, p. 240)

The conditionality of much of the income generated from both public and private sources, leads to some loss of flexibility and predictability for the universities as the block grant from the education ministry declines as a share of total revenue. More broadly, as Slaughter and Leslie have noted on the basis of their investigations of universities in various countries including the USA and Australia, the university develops a new set of dependency relations:

> *We see governments that provide block grant funding and students whose tuitions cover a relatively small share of instructional costs as possessing only limited power in effecting university responses to their desires; this is in contrast with university responsiveness to those who provide money for specific purposes and mandate the accomplishment of those ends.*
>
> (Slaughter & Leslie, 1997)

Third, **the modes of higher education supply are diversifying rapidly as developments in ICT enable new design and delivery paradigms and non-traditional providers enter the market** and by so doing open up new markets in the adult learning domain. Two studies (Cunningham, 1998; 2000) of corporate, virtual and for-profit universities, mostly now in North America but capable of operating transnationally, have highlighted a number of features of the new providers that traditional universities may need to emulate in order to remain relevant and competitive. The convenience of delivery is one characteristic, with providers offering what their customers want, when they need it and where it suits them. Courses or modules are made available using diverse delivery modes (synchronous and asynchronous on-line, delivery via satellite video, self-instructional tools and face-to-face teaching and discussion groups). Customisation is another characteristic whereby courses are tailored to fit the specific circumstances and requirements of the customer. Practical, performative learning applied to real work circumstances is another characteristic as distinct from theoretical knowledge transmission. The best of the new providers attend to the quality of curriculum design and the professionalism of teaching. Disaggregation is another characteristic. The new providers focus only on teaching and learning without the infrastructure and administrative overheads of conventional universities which also have research and community service functions. The new providers 'unbundle' specific activities and services such as curriculum design, teaching, student feedback, assessment, and student services.

Some of these features are to be found among Australian universities in their normal education business and in their new commercial businesses onshore and offshore. In the pursuit of new strategic directions, several aspects of traditional university organisation are coming under pressure, including discipline boundaries and staffing structures, staff hiring and remuneration packages, rigid academic calendars and expectations of the working time and work processes of academics (Coaldrake & Stedman, 1999). In some universities the formerly integrated tasks of course design, learning materials preparation, teaching, tutoring, student feedback and assessment are becoming separate specialist services. Some of these specialist services are being developed in-house and some bought-in as required from external providers. Several

universities are selling part of their services into packages integrated by others and delivered by them to specific markets. Boundaries between academic and non-academic work are blurring. Just-in-time hiring can apply to both categories of staff, who may be engaged by multiple employers who themselves may at times be partners and at other times rivals with a university.

For those services provided internally, some (such as instructional design) are being centralised in technical services units, some (such as student course status and feedback services) are being automated and some (such as scanning of IP for research commercialisation) are being decentralised from the university's commercial arm to the faculties. The expanded use of on-line learning for on-campus as well as off-campus students also has far-reaching implications for: the location, design and use of buildings; policies regarding student possession of or access to computer equipment and internet services; policies for sharing the costs of downloading materials and work for assessment as between students and staff; and the function of libraries.

As these various activities involving use of staff time, financial resources and physical and intangible assets of the university, become increasingly contestable, several universities are moving to output-related costing as a basis for internal resource allocation and for market testing.

Fourth, **there is an increasing tendency for academics in certain fields and non-academic staff with specialist skills to have multiple employers, as well as private sources of income** derived from their own paid work or from their own investments outside of but drawing on their work as employees of the university. In some instances, universities encourage leading academics with expertise in demand to take work with other institutions as a way of retaining their services for the university. There has long been a practice in Medical Schools for the leading academics to be medical practitioners, learning as well as earning on the job and transferring tacit as well as codified knowledge to students. Similar arrangements can be expected to develop beyond current practice for IT, Business, Law and Bioscience Faculties as universities struggle to attract and retain quality staff in these fields. Graduate Schools have been adopting this model for some years. It may well become more generalised. There are also 'moonlighters'. University policies for managing IP and academics' paid outside work will be important in establishing the incentives for retaining the individual academic's sense of belonging to the university which is a precondition for corporate loyalty.

Fifth, **there has been a rapid formation of special, increasingly cross-disciplinary Centres for research and teaching, with some dedicated staff and others drawn from Faculties**. To some extent these Centres represent, at least potentially for the organisation of the university, a countervailing, integrating force to the disintegrating influences discussed above. To realise that potential the connection of a Centre with participating faculties, and with Faculties that need to be drawn into the domain of a Centre's work, requires strategic management. Many Centres currently have limited, mostly technical, representations of expertise from Faculties, whereas commercial realities for many areas require combinations of scientific and technological expertise with contributions from the social sciences and humanities, including legal, economic, marketing, socio-psychological, behavioural, ethical, multi-cultural/linguistic, and creative/artistic contributions. Centres, developed beyond the initial grounds for attracting external funding, can become core elements of a university's competitive advantage, providing attractive, high quality research and

research training environments, engaging industry resources and expertise, and generating income.

Burton Clark appreciated the significance and the risks of what he called 'the enhanced development periphery' of enterprising universities:

> *There is no one-way, no one model to emulate. But the developmental peripheries we have observed have a valuable common outcome: they move a university toward a dual structure of basic units in which traditional departments are supplemented by centers linked to the outside world….With tenured staff mainly in the departments and non-tenured and part-time staff often predominating in the outreach centers, the more temporary units of the periphery are more readily disbanded. Since units of a developmental periphery extend, cross and blur boundaries, they can decisively shape the long-run character of a university. They can develop new competencies close to useful problem solving. They can generate income that helps to diversify funding. They answer the call for interdisciplinary efforts, But if not judged by academic values as well as managerial and budgetary interests for their appropriateness in a university they can move an institution toward the character of a shopping mall.*
>
> (Clark, 1998, p. 138–9)

Sixth, **universities themselves are increasingly collaborating, networking and partnering**. Through these activities they are becoming inter-dependent and some lines of demarcation are blurring both among different universities and between universities and other institutions. Multi-sectoral (higher education and vocational education and training) institutions are mostly confined to Victoria and the Northern Territory. A number of them conduct effectively seamless, articulated curricula with mixes across the HE and VET components tailored to individual students needs, or as packages customised for specific industries or firms. In several States, cross-sectoral precincts are developing, either as campuses or 'study centres', with the involvement of public and private schools, TAFE colleges (public sector VET providers), Further Education Institutes and communities (mostly through Local Government bodies) (Shoemaker et al., 2000).

Collaboration among universities in the sharing of administrative services (e.g. for common purchasing, publishing, cleaning, fleet management, financial and human resources services) is slowly developing, with presently limited initiatives in Perth, Brisbane and Adelaide. Several models are in use or under consideration, for instance, one university providing some services for others, or several universities jointly purchasing services from an external provider. Networking among universities for marketing, benchmarking, lobbying and strategy formation is evident through the formation of the Group of Eight universities, the Australian Technology Network of universities, the Group of Regional Universities, and Universitas 21. Some of these networks include partnering in commercial ventures with private firms and corporates, joint course development, shared courseware (through internal competitive tendering processes), joint badging and mutual recognition of units of study passed and awards. Bilateral partnering between a university and a private provider of delivery services is also an expanding feature of Australian universities' offshore activities.

There are also new forms of on-shore partnering with private firms in the design and delivery of customised education and training programmes. The University of Western Sydney in the early 1990s made arrangements for firm-specific modules to be

integrated within degree programmes for ACI, Caltex and Australia's nuclear science facility ANSTO. Deakin Australia acts as a wholesale arm selling tailored courses to companies like Ford and professional associations like APESMA and has several joint ventures, including with the Coles Institute, and Deakin Corrs, Schneider. The consortium of universities (and VET providers) in Open Learning Australia are providing a spectrum of education and training services on a nationwide basis for the Department of Defence. The Mt Eliza Business School at Monash University has partnered with Honda to form the Honda Business Institute. Macquarie University has an R&D park on campus tenanted by Siemens, Becton Dickinson, Goodman Fielder and Dow Corning. Murdoch University has a private school and a private nursing home on campus as well as various private retailing ventures.

University-to-university collaboration is also maturing. There is now joint development of MBA and related programmes of the U of Sydney and UNSW. Monash and U of Queensland are also jointly developing their graduate business programmes. U of Melbourne and Queensland are jointly contributing capital injections to 'UniSeed' for pre-competitive research commercialisation seed funding. Flinders and Latrobe U are developing joint approaches with overseas universities for students and staff to mix and match their in-country and out-of-country experiences in accumulating credits for awards.

Seventh, **new skill mixes of academic and commercial management expertise are being sought and configured by universities**. Academic authority is given upwards within university settings and the respectability of academic leadership remains important. However, the leading universities have people with demonstrable non-academic strengths in business acumen at the senior executive levels of the organisation and in critical success areas. Getting the balance right can be difficult. An example of the new ask for high-end multi-skilled talent is the recently advertised position at the University of Queensland for Manager, Innovation and Commercial Development in the university's commercial arm, UniQuest Pty Ltd. The position involves implementing a joint venture between UniQuest and the Faculty of Natural Resources, Agriculture and Veterinary Science:

> *Working closely with the Executive Dean and staff within the faculty, the Office of Research and Postgraduate Studies, and with UniQuest's professional team in technology commercialisation, the successful candidate in this position will generate additional research funds and commercial income by:*
>
> - *Identifying new business opportunities and developing new collaborative relationships with the private and public sector both nationally and internationally;*
> - *Raising awareness and enhancing the skills of staff to identify, protect and manage the Faculty's intellectual capital;*
> - *Working closely with staff to add value to projects which have potential to generate funding.*
> - *To succeed in this role, the candidate must have a background and formal qualifications in a relevant discipline together with relevant industry experience. Other desirable attributes include knowledge of the issues involved in the management of intellectual property (including licensing), experience in the development of contractual and consultancy proposals, an understanding of research and its competitive culture, excellent interpersonal skills, good negotiation and communication skills, an understanding of the global marketplace and some project management experience.*

This requirement for new talent at varying levels of the university organisation is occurring, propitiously as the academic workforce is ageing and as opportunities for rejuvenation are expanding (Jones et al., 1999). A number of universities are now reassessing their internal workforce requirements, going beyond conventional succession planning to more proactive planning for future success. They are looking to attract intellectual talent, technical competence and commercial expertise.

On the basis of discussions with the executives of institutions and inspection of their documentation, the following factors can be identified as characteristics of leading practice among Australian universities in the management of their various commercial activities:

a sharper focus—the university understands the need to be and is clearly focused on tightly defined objectives, on its competitive strengths and on innovation. Strength is tested against hard benchmarks, including quantitative performance and rates of return measures. Resources are not dissipated on under-performing areas.

greater transparency—the financial position of the university, its general competitive positioning, its strategic intent and the criteria for resource management decisions are all well understood by all staff. Every organisational unit can replicate the application of decision rules and identify what it needs to do to earn its way improve its standing.

internal financial incentives through performance-based resource allocation—organisational units are rewarded for achieving agreed goals, appropriate to their varying circumstances, for raising the educational, research, financial and reputational profile of the university. Policies for charging university overheads and capturing whole-of-university returns from commercial activities have been discussed internally, and are clear and consistently applied. Policies for IP ownership and returns, approval, reporting and overheads charging for paid outside work, and conditions of use of Special Account funds, are clear and consistently applied.

better integration of activities but with clearer separation of functional expertise– formerly separate structures, processes and information sets (including performance information) are brought together and considered strategically within a portfolio overseen by a member of the Executive. Academic expertise is assigned to academic pursuits. Commercial management is tasked to people with business expertise.

matrix management—There is a coherent strategy for the development of special, multi-disciplinary Centres for teaching and research and their interactions with Faculties, and these interactions are overseen and facilitated by a member of the Executive as an explicit element of the Executive member's performance agreement. Deans of Faculties and Directors of Centres are appointed on merit for their academic leadership and their administrative skills and take collegial management responsibility for both the development of their units and the development of the university as a whole.

flexibility of ways and means—Each potentially commercialisable initiative is assessed on a business case-by-case and market-by-market basis. Options are available for seeking to commercialise an idea or invention, whether in-house or

through external partnering, through various mechanisms including patenting, licensing, joint venture, spin-out, equity investment, etc.

stricter approval processes but with fewer steps—all commercial ventures that expose the university to risk are subject to rigorous scrutiny and require high-level approval, and specific mechanisms are in place to enable direct decision making by the Vice-Chancellor. Wherever possible, risks are spread so as to avoid up-front use of the university's own capital.

knowledge of strengths, costs, market needs and competitor strategies—the business case for commercial ventures is professionally prepared, based on accurate up-to-date quantitative and qualitative information, relating to the university's capabilities, the conditions of the particular markets being targeted, the performance of rivals and the development of new products.

real business acumen and commercial management competence—Academics do not make commercial judgements without the involvement of experienced business people. Commercial operations are not run by academics promoted to executive positions—they are run by people with commercial expertise and experience. The university Executive only exposes the University to financial risk when it has professional commercial advice strongly recommending a course of action, accompanied by a thorough risk management strategy. The university management also require discipline on the part of internal units in hard, no-nonsense terms, in providing full-cost plus returns to the university from their activities, including those resulting in any private gain from the use of university reputation and resources.

reliable access to expertise—many universities cannot afford to retain in-house expertise for such specialised services as patenting, market-demand assessment etc. However, they have arrangements for obtaining such services as required, either through agreements with other universities and/or through private contracts.

well developed networks for intelligence gathering and brokering—Universities invest to ensure they have reliable up-to-date intelligence about the markets in which they operate or seek to operate. They also work at building relationships with key players in order to open doors for quick response and clearance through authorities.

quality assurance of partners—Universities working with partners for the delivery of services ensure that they are properly constituted and authorised, financially solvent and appropriately insured, are ethical in their affairs, and maintain quality processes and standards that do not diminish the reputation of the university.

7. Some unresolved issues

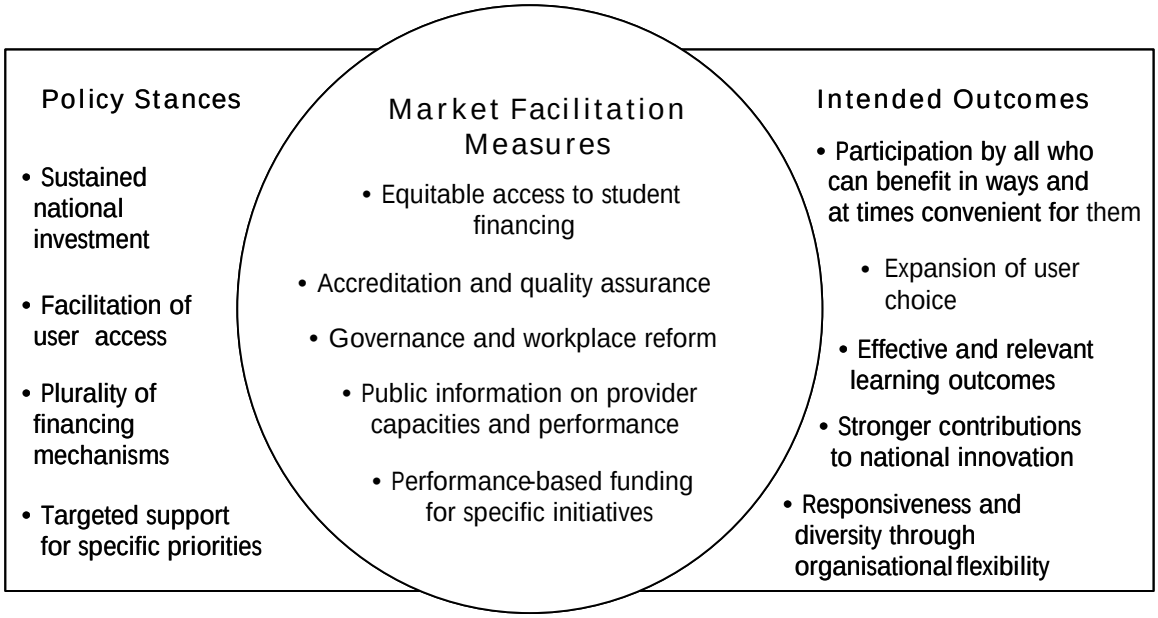
Not only are new expertise and new forms of organisation being required but new cultural values are being asserted, and academe is having difficulty establishing the balance between intrinsic and extrinsic motivations and purposes. Academic workloads are reported to be rising as pressures to publish, teach, undertake new administrative tasks and raise funds all reduce time for quality thinking (McInnis, 2000). The combined demands of students, employers and professional bodies for specific course content modules in flexible sequences raises questions of curriculum coherence (DETYA, 1997). The emerging market opportunities are more open to some fields of study than to others and concerns arise about the sustainability of the latter and the implications of that for breadth of scholarship and the role of the university in respect of the public good. Differentiation is shaping not only within but also among universities, giving rise to questions about the relative value of the academic awards of different providers and representing a shift from Australia's purported egalitarian tradition of 'parity of esteem'.

For those involved in commercially-sponsored activities issues may arise in relation to the timing and extent of disclosure of research findings, restricting knowledge sharing and academic dialogue. Conflict of interest issues may also arise, for instance, when professors hold or can acquire stock in the company sponsoring their research or make private gains using public resources. The universities need to manage these matters as far as possible themselves by developing and promulgating current, clear and auditable policies and procedures, such as for declaration of interests, approval of engagement in private paid outside work, allowable use of and charges for university resources, and ownership and exploitation of IP. More broadly, some matters of science and technology, such as genetic manipulation, involve socio-ethical judgements that go beyond the prerogatives of academe and are subject to democratic decisions.

8. Changing university relations with the state

With the shift to a market orientation, the relations of the state with universities are shifting from directive to facilitative policies and mechanisms but with a stronger emphasis on accountability for outcomes. There is simultaneously a loosening and a tightening of regulatory measures; a loosening of input and process controls to enable the universities to be more enterprising and a tightening of demands relating to educational standards and cost-effective use of resources as they become so. The evolving framework, which is currently taking shape, is illustrated at Figure 6.

Figure 6 Policy architecture for a transition to a more market-oriented system of higher education



The main objectives of the Commonwealth Government's policies for higher education are to: expand opportunity, assure quality; improve universities' responsiveness to varying student needs and industry requirements; advance the knowledge base and university contributions to national innovation; and ensure public accountability for the cost-effective use of public resources (Kemp, 2000). The key policy stances adopted by the Government in respect of these goals relate to: sustaining the nation's investment in higher education, having regard to a fair sharing of the costs by the direct beneficiaries; facilitating access by students and industry to higher education services through both campus-based, distance and on-line provision; establishing a mix of mechanisms for financing student access and institutional provision, including tuition free grants on grounds of equity (for enabling students) and merit (higher degree research students), HECS-liable places

and fee-paying opportunities; and targeting support for specific initiatives (e.g. to improve participation and success for specific groups or to increase the supply of specific skills).

The five major market facilitation measures (see Figure 6) include incentives for institutions to reform their internal governance structures and processes and workplace relations (outlined above) in order to develop the flexibility necessary for responding to changes in demand and competition. Performance-based funding initiatives are key drivers of the reforms to higher education research and research training (also discussed above). The increased publication of information[35] about provider capacities and performance results from the need for improved information for guiding student choice and public accountability requirements. As noted above, there are at times some tensions between the universities and government agencies over the development and publication of performance indicators. These tensions arise partly out of normal debate over the validity and reliability of measures and the appropriateness of their use for particular purposes. In some instances there are differences between the competitive interests of individual institutions and the public need for objective information against which to compare institutions' own claims.

Closer attention to quality arises from the need to ensure educational standards, inform student choice and protect Australia's international reputation. The national quality assurance framework has been strengthened by agreement of the Australian State, Territory and Commonwealth governments. The term 'university' is protected by legislation. Universities are established by State or Territory legislation following a detailed assessment of their academic and financial credentials. Once accredited, the universities are listed on the Australian Qualifications Framework register as self-accrediting institutions, authorised to accredit their own courses and responsible for their academic standards. They are required to have appropriate quality assurance processes in place, including course approval processes, peer assessment processes and external examination of higher degrees. Professional bodies need to be involved in the accreditation of particular courses.

State and Territory Government accreditation authorities also accredit higher education courses delivered by non self-accrediting providers. All courses for international students must be approved by the relevant State or Territory accreditation authority. Courses are listed on the Commonwealth Register of Institutions and Courses for Overseas Students (http://cricos.detya.gov.au/). The Commonwealth publishes a range of comparative information about the characteristics and performance of universities. DETYA publishes university quality assurance and improvement plans annually, provides awards for innovative teaching practice and funds projects to promote quality improvements in teaching and learning through the Australian Universities Teaching committee.

[35] The Quality Improvement Plans and Equity Plans of universities are published annually in a comparative form. The Research and Research Training management Plans are similarly to be published annually. All of these plans include performance information. A broad set of institutional comparative indicators is published by DETYA biennially. The Minister's annual Higher Education Report for the Triennium contains trend data on institutional and sectoral performance. A set of descriptors and indicators by field of study across institutions is published on the DETYA web site. Higher education student, staff and finance statistics are published annually by DETYA.

A new body, the Australian Universities Quality Agency, is in the process of being established. The agency will conduct audits of teaching, learning, research and administration in Australian universities on a five-year rolling cycle. The audits will scrutinise the claims of institutions against their own missions and objectives. The agency also has the power to audit the processes of State and Territory accreditation authorities. The reports of the audits will be made public. Action in response to audit findings will be the responsibility of institutions in the first instance and State/Territory governments and the Commonwealth where necessary.

Australia's higher education financing policy framework has been the subject of public discussion over the last several years. A national committee of review (DETYA, 1998b) was established and the Government began the process of constructing a response to its recommendation for a deregulated student-centred system. In the public domain are the proposals of a leaked submission to the Cabinet (Executive) of federal Government.[36] The leaked submission noted the mounting pressures on universities and canvassed the option of a demand-driven system characterised by fee and admissions deregulation, a universal public subsidy for undergraduate students and a loans scheme to finance students' costs of tuition. That is, all students admitted by universities would be entitled to receive a government subsidy of the costs of their course; the universities would be free to determine their student numbers and the prices they charged; and a HECS-style[37] income-contingent loan would be available for students, as required, to make up all or part of any gap between the government subsidy and the tuition price.

The Government rejected that course and confirmed the basic parameters of existing policy: fees will not be deregulated; vouchers will not be introduced; HECS will not be charged for TAFE; the current HECS system will remain; there will be no additional loan system, or real interest rate attached to the current HECS system; and the current system of Government subsidies and funded places will remain, as will the prohibition on charging fees for HECS-liable places. Bipartisan support for HECS reflects its role in ensuring equity of access to higher education by providing an alternative to upfront fees for financially disadvantaged students. This is a distinguishing feature of the Australian system.

The universities are broadly free to determine volumes and prices for enrolments, except for their domestic undergraduate students. Some of the initiatives of universities to expand their discretionary income are testing the boundaries of the regulatory regimen, such as in some cases of credit recognition towards a degree for studies undertaken through a private arm. Several interest groups are now pressing for concessions within the current regulatory framework, such as exemptions from HECS for particular professional groups for whom graduate supply is seen to be insufficient, despite evidence that HECS is not a deterrent to participation (Andrews, 1999). Questions have been raised regarding access at the postgraduate coursework level for those people who are deterred from entering their chosen profession by the requirement to pay fees up-front (Higher Education Council, 2000; Department of Industry Science and Resources, 2000). The re-positioning of universities in the context of the new policy framework for research and research

[36] www.alp.org.au/media/mlmsuni_cab_doc131099.html

[37] The current linkage of the government subsidy to students provided through HECS would be disconnected from the fees charged by universities and the HECS-style loan would be available to students in other than government-subsidised places.

training provides a once-off opportunity to reallocate some places to HECS-liable postgraduate coursework opportunities.

With growing diversification of providers and modes of provision of higher education as well as demand, central planning approaches using supply-side subsidies are becoming increasingly problematic and the pressures for demand-side financing approaches are likely to increase. Special circumstances may require occasional supply-side interventions of a targeted or contestable type, or Community Service Obligation subsidies. The general implication for financing policy (see Figure 4) is for governments to retain their capacity to adopt a plurality of approaches to meet varying needs within a coherent framework enabling universities to have competitive flexibility and students to have choice and equitable access.

With declining dependency of universities on government-provided financial assistance and their increasing involvement in commercial activities, the steering role of the national education ministry is moving from a transverse to a parallel position of influence. Concurrently, the universities are forming new relations with multiple government agencies at the federal, state and local levels within Australia and overseas. These new relations include matters of business law and competition policy, taxation, industry development, immigration, trade, clearance through regulatory bodies relating to genetic modification of plant, animal and human matter, communications, industrial relations, consumer protection, copyright and insurance.

Responsibilities for provider and course accreditation, institutional governance and financial audit rest primarily with State and Territory governments in Australia's federal system. Whereas the Commonwealth is seeking to increase flexibility for universities to be responsibly enterprising, some aspects of State/Territory interactions with universities can reduce their flexibility. Tensions may emerge between the universities and the different levels of government about their aspirations. A university may seek to shape itself to meet the imperatives of competition in ways that do not coincide with the views of regional communities about the form it should take and the services it should offer in a particular area. An emerging role for the national education ministry, necessarily networking with others, is to monitor university developments and interactions from a whole-of-government perspective, and provide policy advice as necessary for selected interventions.

9. Conclusion

Most of Australia's public universities are now pursuing, and many quite aggressively, new avenues for expanding income from a variety of commercial activities, though some are driven more by budgetary constraint than strategic purpose. Even for those that are taking a strategic approach, there are substantive cultural and procedural issues to be addressed in achieving support within the academy for the vision for the organisation. They are also having to develop more flexible staffing arrangements and operating procedures to meet market requirements and gain access to specialist expertise as required from outside the university community. They are making collaborative arrangements for expanding into new markets and commercialising their outputs. Those arrangements involve sharing with outsiders various aspects of university activity once held within, with some diminution of traditionally valued academic autonomy and exposure to financial and reputational risks. They are all learning as they go; trying, borrowing and modifying different approaches to suit their varying purposes and circumstances. There is no apparent single best way.

For the others, the issues are more vexed: the challenge is not owned by the university but is rather seen as imposed through someone else's failure; the commercialisation options are marginal rather than integral to the core business; the processes for identifying and realising commercial income are ad hoc and risk being unsustainable; internal winners are resented by relative losers because there is no clear set of central organising principles around which debate and renewal can occur. Lack of clarity and capacity in university leadership together with ambiguities in the policy framework for the sector make the process of transition especially difficult.

Revenue diversification is generally considered to underpin university autonomy but this is not always necessarily so. The earning of income incurs costs and often involves conditions limiting its use; if not managed well it can constrict rather than expand institutional capacity and discretion. Many universities have learned well from their experiences over the last decade and are adopting more formalised and professional approaches to commercial management.

The community's expectations of universities in the knowledge economy are rising. The sources of sustainability for universities as organisations are diversifying. The character of universities is being transformed in the process. The relations of the state with universities are also changing from a directive to a facilitating role, with a stronger interest in accountability for outcomes. To be academically respectable, globally competitive, locally relevant and nationally contributive is a major challenge for Australia's universities.

Bibliography

A C Nielsen Research Services 2000, *Employer Satisfaction with Graduate Skills; Research Report*, EIP Series 99/7, Higher Education Division, DETYA, Canberra

Andrews, L. 1999, *Does HECS Deter? Factors affecting university participation by low SES groups*, Occasional Papers Series 99-F, Higher Education Division, DETYA, Canberra

Audit Office of New South Wales 2000, *Academics' Paid Outside Work*, Performance Audit Report, Audit Office, Sydney

Australian Academy of Technological Sciences, 1983, *Developing High Technology Enterprises for Australia*, Parkville, Victoria

Australian Government Publishing Service, 1995, *Higher Education Management Review; Report of the Committee of Inquiry*, AGPS, Canberra

Australian Research Council 1999, *University Research: Technology Transfer and Commercialisation Practices*, Commissioned Report No. 60. Canberra

Bessant, B. 1992, 'Managerialism, Economic Rationalism and Higher Education', in Marshall N. & Walsh, C., *The Governance and Funding of Australian Higher Education*, Federalism Research Centre, Australian National University, Canberra

Bowden, J., Hart, G., King, B., Trigwell, K. & Watts, O. 2000, *Generic Capabilities of ATN University Graduates*, Australian Technology Network Teaching and Learning Committee

Clark, Burton R. 1998, *Creating Entrepreneurial Universities: organizational pathways of transformation*, Pergamon Press, New York

Clark, Burton R. 1983, *The Higher Education System; Academic Organization in Cross-National Perspective*, University of California Press, Berkeley

Coaldrake, P. & Stedman, L. 1999, *Academic Work in the Twenty-first Century; changing roles and policies*, Occasional Paper Series 99-H, Higher Education Division, DETYA

Cripps, D., Yencken, J., Coghlan, J., Anderson, D., & Spiller, M. 1999. *University Research: Technology Transfer and Commercialisation Practices*, Australian Research Council, Canberra

Cunningham, S. Tapsall, S. Ryan, Y. Stedman, L. Nagdon, K. & Flew, T. 1998, *New Media and Borderless Education: A Review of the Convergence between Global Media Networks and Higher Education Provision*, EIP Series 97/22, Higher Education Division, DETYA, Canberra

Cunningham, .S. Ryan, Y. Stedman, L., Tapsall, S. Bagdon, K.. Flew, T. & Coaldrake, P. 2000, *The Business of Borderless Education*, EIP Series 00/3, Higher Education Division, DETYA, Canberra

Dawkins, J.D. 1988, *Higher Education; a policy statement*, AGPS, Canberra.

Dawkins, J.D. 1989, *Research for Australia: Higher Education's Contribution*, AGPS, Canberra.

DEET 1993, *Recent Trends and Current Issues in Australian Higher Education*, Occasional Papers Series, Higher Education Division, DEET, Canberra

Department of Education, Training and Youth Affairs 1998a, *The Characteristics and Performance of Higher Education Institutions*, Higher Education Division, DETYA, Canberra

Department of Education, Training and Youth Affairs 1998b, *Learning for Life: Final Report of the Review of Higher Education Financing and Policy*, DETYA, Canberra

Department of Education, Training and Youth Affairs 1999, *The Quality of Australian Higher Education*, Higher Education Division, DETYA, Canberra

Department of Education, Training and Youth Affairs 2000, *Overseas Student Statistics 1999*, Australian Education International, DETYA, Canberra

Department of Employment, Education, Training and Youth Affairs 1997, *Thematic Review of the First Years of Tertiary Education, Australia*, OECD, Higher Education Division, DETYA, Canberra

Department of Industry Science and Resources 2000, *Innovation: Unlocking the Future*, Final report of the Innovation Summit Implementation group, DISR, Canberra

Ernst & Young 1998a, *'Issues Report on Costing within Australian Higher Education Institutions', Part 1 of 2 (Final*), Higher Education Division, DETYA, Canberra

Ernst & Young 1998b, *'Costing Methodology For Use within Australian Higher Education Institutions', Part 2 of 2 (Final)*, Higher Education Division, DETYA, Canberra

Gibson, D. et al. 1999, *Performance and Client Service in a Competitive and Rapidly Changing Environment: Queensland University of Technology*; Occasional Papers Series, 99-C, Higher Education Division, DETYA, Canberra

Higher Education Council 2000, *Access to Postgraduate Courses: Opportunities and Obstacles*, Commissioned Report No. 64, NBEET, Canberra

Hill, S. & Turpin, T. 1994, 'Cultures in Collision: The Emergence of a New Localism in Academic Research:, in Strathern, M. (ed) *The Uses of Knowledge: Global and Local Relations*, Routledge.

Hoare, D. et al. 1995, *Higher Education Management Review; Report of the Committee of Inquiry*, AGPS, Canberra.

Kemmis, S. & Maconachie, D. 1998, *Strategic Repositioning: Identifying Areas for Future Investment; a case study of rapid change at the University of Ballarat*, Occasional Papers Series, Higher Education Division, DETYA, Canberra

Kemp, D.A. 2000, *Higher Education Report for the 2000 to 2002 Triennium*, DETYA, Canberra

Kemp, D.A. 1999, *Knowledge and Innovation: a policy statement on research and research training*, DETYA, Canberra

OECD/DEET 1993, *The Transition from Elite to Mass Higher Education*, Occasional Papers Series, Higher Education Division, DEET, Canberra

Jones, E. et al. 1999, *University Staff 1989 to 1998.* Higher Education Series, No. 35, Higher Education Division, DETYA, Canberra

Karmel, P. 1992, *The Australian University into the twenty first century*, Volume 64, No. 1, The Australian Quarterly

Kogan, M. & Hanney, S. 2000, *Reforming Higher Education, Higher Education*, Policy Series 50, Jessica Kingsley Publishers, London

Matthews, M., Johnston, R., & Dodgson, M. 2000 *Enabling the Virtuous Cycle: Identifying and Removing Barriers to Entrepreneurial Activity by Health and Medical Researchers in the Higher Education Sector*, EIP 00/14, 2000 (forthcoming), DETYA, Canberra

MCEETYA, *National Protocols for Higher Education Approval Processes*, 2000, www.detya.gov.au/highered/mceetya_cop.htm

McInnis, C. 2000, *The Work Roles of Academics in Australian Universities*, EIP Series 00/5, Higher Education Division, DETYA.

McKinnon, K.R., Walker, S.H. & Davis, S. 2000, *Benchmarking: a manual for Australian universities*, Higher Education Division, DETYA, Canberra

McNaught, C., Phillips, R., Rossiter, D., & Winn, J. 1999, *Developing a Framework for a Useable and Useful Inventory of Computer-facilitated Learning and Support Materials in Australian Universities*, Higher Education Division, DETYA, Canberra

Mitchell, G. & Nossal, G. 1999, *'Funding options for research: facing the market as well as government'*, International Journal of Parasitology.

Monotti, A. L., 2000 'Allocating the rights in Intellectual Property in Australian universities; An Overview of Current Practice', *Federal Law Review*, Vol. 27, No. 3

National Board of Employment Education and Training 1993, *Crossing Innovation Boundaries: the formation and maintenance of research links between industry and universities in Australia*, Commissioned Report No. 26, AGPS, Canberra.

National Board of Employment, Education and Training 1995, *Using Basic Research: assessing connections between basic research and national socio-economic objectives; Part 1; Review of Current Theory and International Practices.* Commissioned Report No. 36, AGPS, Canberra.

National Board of Employment, Education and Training 1996a, *Using Basic Research, Part 2: Socio-economic Connections to Academic Research in Australia*, Commissioned Report No. 37, AGPS, Canberra.

National Board of Employment, Education and Training 1996b, Commissioned Report No. 47, AGPS, Canberra.

Office of the Auditor General, Western Australia 1994, *University Consultancy Services*, Performance Examination Report No. 5C

Shoemaker, A. et al. 2000, *Multi-Partner Campuses: The Future of Higher Education*, EIP 00/13, Higher Education Division, DETYA, Canberra

Slaughter, S. & Leslie, L. L. 1997, *Academic Capitalism: Politics, Polices and the Entrepreneurial University*, The John Hopkins University Press, Baltimore

Thorburn, L. 2000, OECD Working group on Innovation and Technology Policy , *Analytical Report on High Tech Spin Offs*, DSTI/STP/TIP (2000) 7

Turpin, T. & Hill, S. 1995, 'Researchers Cultural Boundaries and Organisational Change', in Simpson, R. & Simpson, I. (eds.), *Research in the Sociology of Work; Volume 5: The Meaning of Work*, JAI Press

University of South Australia, *Developing the qualities of a University of South Australia graduate: Guide to writing course and subject documents*, www.unisa.edu.au/usainfo/gqguide.htm

Yetton, P. & Associates 1997, *Managing the Introduction of Technology in the Delivery and Administration of Higher Education*, EIP Series 97/3, Higher Education Division, DETYA, Canberra