

Chapter two – Education Developments

In many ways, the 1990s marked a significant shift in the attitude of universities to students. Universities became more student-focused, tailoring courses to meet students' requirements and paying greater attention to the quality of the learning experiences they offered students.

There were a number of imperatives driving universities to take a more student-centred approach to course offerings, curriculum, teaching, learning, and assessment. The fall in domestic demand for higher education places⁹ a climate of fiscal constraint; and the significant increase in the number of universities following the end of the binary divide between universities and colleges of advanced education, heightened competition between universities. It was more important than ever for universities to attract students to their campuses as consumer demand had more of an impact on university budgets. There was a greater awareness of the buying power of students as universities realised the importance of attracting fee-paying overseas and postgraduate students as well as domestic undergraduate students. Students paying for their education, either through the Higher Education Contribution Scheme or up front fees, demanded value for their investment. In this environment, it is not surprising that many universities began to focus more keenly on the product they provided to students and how it was delivered.

It was also a period in which universities were being scrutinised and held accountable to an unprecedented extent¹⁰. During the 1980s and continuing throughout the 1990s there was a growing emphasis on public organisations producing quality outcomes. The public service had been transformed by this approach. There was greater demand that universities be accountable and provide value for money. The quality assurance mechanisms of universities were reviewed in the early 1990s by the Committee for Quality Assurance in Higher Education. Performance indicators were developed to measure the achievements of universities and universities were required to provide the Commonwealth with annual quality assurance plans. By the end of the decade a national quality assurance framework was in place and one area that received particular attention from this perspective was the quality of teaching and learning.

At the same time, developments in information and communications technology provided universities with the tools to change many aspects of the way they operated, including the way they taught. Not only could units of study and whole courses be delivered online but also the revolution in information and communications technology opened up new possibilities for the types of learning experiences that could be offered to students. The information and communications technology revolution meant that the number of new courses in this field expanded considerably and expansion in other areas of knowledge, such as biotechnology and genetics, led to new topics of study being introduced into the curriculum.

The change to a more student-centred approach by universities in the 1990s not only generated innovations in teaching and learning and approaches to assessment, it also resulted in a significant increase in the number of courses available to students and a change in the nature of courses offered. Students seemed to be more interested in choosing courses that would give them a career advantage whether it was through choosing more vocationally oriented courses, courses linked to industry or professional association accreditation, or undertaking combined degrees, second degrees or postgraduate study. Universities offered more specialist courses to meet this increased instrumentalism. Some courses were repackaged to make the pathways to employment more obvious, some were completely reoriented, new courses were developed in growth areas or areas of new knowledge, and some universities formed alliances with other organisations to give students additional benefits. Universities began to focus on broad

⁹ See chapter seven, Figure 7.7

¹⁰ Readers are referred to chapter six on quality assurance for more details on the quality movement in higher education.

graduate attributes with the labour market in mind, as well as traditional discipline knowledge and skills.

The changes in courses, curriculum, teaching and learning were not just a reaction to the career aspirations of students. Universities also believed that they needed to cater for a more diverse student population than ever before. Although, in reality, the characteristics of the student population had not changed as much over the decade as is commonly believed¹¹, the work/study patterns of students changed, with full-time students working more than they had before. The proportion of mature age students also increased. These changes had implications for the way courses were delivered and structured and increased the need for universities to become more flexible at a time when changes in information and communications technology were providing them with the tools to achieve this.

This chapter describes some of the changes in university courses and curriculum, approaches to teaching, learning and assessment, and the uptake of information and communications technology. It concludes with a brief exploration of some of the issues arising from the educational developments of the 1990s.

2.1 Changes to Curricula and Courses

In keeping with their conception as 'civilising agents', the first universities in Australia started off by offering classes in Greek, Latin, philosophy, mathematics and natural philosophy, but this classical curriculum was not appealing to many citizens of the colonies¹². It soon became apparent that in order to attract sufficient students the universities would need to broaden into professional areas such as law and medicine (MacIntyre 2001). So even from their founding, the curricula of universities were shaped by the view of universities as bastions of higher learning and contributors to the good of society, and the practical need to appeal to prospective students.

The Australian universities began as places of learning, as a mark of culture and distinction. They survived by making themselves useful. (MacIntyre 2001, p. 4)

What was useful, and what appealed to prospective students, depended very much on the social context of the time. Initially, law and medicine dominated the university curricula but studies in engineering and agricultural sciences were gradually added in response to Australia's developmental needs (Bolton 2001). After the Second World War, science, engineering, and medicine were seen as the key to national security, economic competitiveness and welfare. Economics, psychology, sociology and the social sciences were seen as important to the solution of social problems and the humanities and arts were seen as contributing to a civilised, modern nation (MacIntyre 2001). There were some concerns about university courses simply becoming pathways to specific vocations rather than providing a more universal education although Martin (1965) recognised that students may both value learning and yet choose a course that leads to a career:

In Australia, particularly since the Second World War, there has been a drift of students away from courses designed to simply educate, to those more directly concerned with providing qualifications for a livelihood. The extent to which a student regards a university education as a means of fitting himself (sic) for a specific job must colour his choice of courses.

¹¹ Readers are referred to chapter seven for more details on student characteristics.

¹² 'The impetus to found universities in Australia, was not to satisfy demand, but rather to recreate the social order and the institutions of the 'Mother Country'. At the time of Federation in 1901, less than 0.07 per cent of the population attended university, at the outbreak of the Second World War this figure had risen to 0.2 per cent (DEET 1993).

When a student enrolls in medicine, architecture or engineering, it is clear that he has an ambition to be a physician or a surgeon, an architect or specialist engineer. He may be keenly aware of the value of a tertiary education or of the intellectual discipline and stimulus associated with higher studies, but his studies are aimed at achieving proficiency in a vocation.

(Martin 1965, vol. III, p. 2)

In the late 1960s and early 1970s, colleges of advanced education were established around Australia¹³ to provide vocationally oriented courses with a more practical and less theoretical emphasis than university courses. They filled the gap between the generalist undergraduate programs in the humanities, sciences and social sciences and the skills-oriented courses offered in technical colleges and institutes. In theory, this binary system of universities and colleges of advanced education allowed universities to concentrate on the broader or more theoretical aspects of academic study while colleges met the demand for courses more clearly focused on the needs of industry and the vocational aspirations of students. However, colleges of advanced education eventually offered many of the vocational or professional awards available in universities although there were some courses only available through one type of institution¹⁴. By the mid-1980s there were strong pressures within the advanced education sector towards greater convergence with the university sector. There was already an overlap between the type of awards provided by universities and colleges and a move by colleges to offer honours and postgraduate awards that traditionally provided the opportunity for university students to specialise in particular areas.

The drift from generalist to specialist study in universities, identified by Martin twenty years previously, continued (Department of Employment, Education and Training 1993). There were debates about the appropriateness of non-traditional courses such as chiropractic education, radiography, nursing and teacher education, in the curriculum of universities. Interest in more traditional subjects such as European studies waned and enrolments dwindled in the core disciplines of science, physics, chemistry, and mathematics over the 1980s and continued into the next decade. In their place, demand quickened for business studies, information technology, and legal studies (Bolton 2001).

A Senate Inquiry into higher education at the beginning of the 1990s found even though standards were generally high and the graduates usually well-grounded in the knowledge and skills necessary to practise their profession they lacked more generic capabilities (Department of Employment, Education and Training 1993).

That Australia is producing graduates who, all too frequently, are not familiar in any disciplined sense with the society in which they are going to practise their chosen profession, who are not analytical, creative thinkers, whose education does not provide the basis for adequate flexibility, who are not sufficiently attuned to the need for "lifelong" learning, and who are not good communicators. In short, Australia is producing highly trained technicians who are undereducated in the broader sense of the term.

(Parliament of the Commonwealth of Australia 1990, p. xiii cited in Department of Employment, Education and Training 1993)

This sentiment was echoed by the National Board of Employment, Education and Training which believed that the needs of industry were often best served by broad or more general pre-employment courses with specialised training on the job, and opportunities for retraining throughout employment. It warned that courses could become too specialised and vocationally oriented and therefore, quickly outdated (Ramsey 1990).

¹³ Many colleges of advanced education were formerly teachers colleges.

¹⁴ Medicine, veterinary science and dentistry courses were only available in universities and some visual and performing arts, paramedical studies and emerging fields such as hospitality, leisure and tourism were only available in colleges (DEET 1993),

In contrast, in the early 1990s, the vocational education and training sector focused on work-related competencies and considerable work was undertaken to identify and describe the knowledge and skills required for particular occupations. Some professional associations developed entry-level competency standards for professional practice which opened up the possibility that professional associations might seek to have such standards reflected in higher education courses (Department of Employment, Education and Training 1993, Rosenman 1996). The concept of a competency-based system underpinning higher education was not supported by the Australian Vice-Chancellors' Committee. The Committee had concerns:

that outside agencies and professional bodies might seek to use the development of competency-based standards as a means for dictating what ought to be taught in university courses, shifting the balance from academic judgement about what will be necessary in the future to the judgement of those whose knowledge and experience are grounded in present or past practice.

(Australian Vice-Chancellors' Committee 1992, p. 1)

The vice-chancellors argued that while the development of skills, knowledge and understanding was central to the role of universities, it was not the responsibility of universities to shape courses in response to changes in current professional or workforce needs. They saw university education as much more than training for the professions.

The broadening of knowledge, encouragement of creativity, intellectual stimulation, and the exercise of imagination and originality are precisely what genuine education pursues and what training, however sophisticated and well-delivered, cannot.

(Australian Vice-Chancellors' Committee 1992b, p. 3)

One obstacle that was seen as preventing a concentration on the development of these generic skills was the great explosion of knowledge that occurred and the desire to ensure courses were up to date. The Commonwealth suggested that the way to deal with the continued growth in specialised knowledge was not to try and squeeze more into the already crowded undergraduate courses but to move undergraduate course elements into specialist postgraduate offerings where employers would meet the costs of providing industry-specific, or firm-specific education. In this way, it was thought that the undergraduate curricula could be broadened so that it could provide a more rigorous foundation for lifelong learning¹⁵ (Baldwin 1991, p. 43). Candy, Crebert and O'Leary (1994), when discussing the development of lifelong learning through undergraduate education, also suggested that some technical components of undergraduate courses may need to be transferred to postgraduate courses in order for generic skills to be included in undergraduate degrees. Postgraduate courses became a way of extending and developing professional expertise and gaining professional qualifications. (See Box 2.1).

¹⁵ Although the notion of learning throughout one's life is not a new one, in the 1990s considerable attention was paid to it. It was realised that it was not enough to provide formal learning opportunities only in the earlier stages of life but that people needed to be able to dip in and out of formal learning experiences throughout life, especially as they were likely to change careers more frequently than people did in the past. Undergraduate education was seen as a time when students could be given the skills to assist them to do this (Candy, Crebert and O'Leary 1994).

Box 2.1 Examples of links to industry and professional organisations

CPA MBA at Deakin University

Deakin University offered a Master of Business Administration (MBA) in 2001 that was designed in conjunction with CPA Australia. CPA Australia is a professional association of chartered practising accountants with over 95,000 members. The CPA MBA has a compulsory core of units comprising five CPA program units (which students can claim as credit as part of their CPA program – a postgraduate qualification necessary for full membership of the professional association) and three compulsory Deakin units. Students complete four electives which can be undertaken as a specialisation in a topic area e.g. e-commerce, or selected individually from a list of over 40 electives. The degree was specifically designed to enable CPA Australia members to undertake the transition from technical accounting practice to become business advisors.

(Orr, S. 2001, *Campus Review*, 11 (35) p. 17)

Biotechnology at the University of Queensland

In 2001, the University of Queensland offered undergraduate and postgraduate (graduate certificate, graduate diploma, master, and doctorate) studies in biotechnology. Biotechnology was becoming increasingly popular. Enrolments in the bachelor degree had increased threefold in two years, and enrolments in postgraduate by coursework had increased fivefold. There was also increased interest in the professional doctorate program. Half of the postgraduate students came from overseas. Local postgraduate students were drawn predominantly from the local biotechnology industry including companies, hospitals, State Government agencies and law firms. Students have the option of completing their research thesis in industry or international settings. The University has strong links to research institutes and the local biotechnology industry which contributes to teaching and hosting students for industry based research.

(Barnard, R., 'Biotechnology Boom at the University of Queensland', *Campus Review*, 11 (37), 2001 p. 21)

Tied in with the increased focus on developing competencies and generic skills was a growing emphasis on identifying and measuring the desired outcomes of university education. In 1992, Peter Baldwin, Minister for Higher Education and Employment Services outlined the:

responsibility of higher education institutions to ensure that the outcome of their education process is a quality graduate, with the necessary attributes, including the practical application of professional knowledge skills where appropriate.

(Baldwin 1992 cited in Department of Employment, Education and Training 1993, p. 172)

Candy, Crebert and O'Leary (1994) argued that in order to develop lifelong learning capabilities, courses should be designed to: enable students to develop learning-to-learn capabilities and information literacy; provide an Australian perspective; and to take account of students' prior learning. Undergraduate curriculum should develop both professional knowledge and skills and generic skills. It should develop: the technical knowledge and skills relevant to a particular discipline or field of study; a general education or broadening component; and some generic or personal transferable skills. In 1998, the Commonwealth required all publicly funded universities to specify their graduate attributes in their Quality Assurance and Improvement Plans submitted annually to the Commonwealth Department of Education.

There were concerns that the real value of learning in a university – the critical, disinterested pursuit of personal understanding of a discipline and an understanding of the nature of knowledge – was in danger of being replaced by a focus on skill development and the transmission of information (Cunningham et al. 2000). The growth of specialist subjects was seen by some to diminish the value placed on more traditional university subjects, especially

those in the humanities, and seemed to signal the demise of the valuing of a broad education to the ultimate detriment of students. This was not a new lament (Murray 1957, p. 8).

In 1996, Rosenman argued that specialisation was at the expense of more intellectual, and less instrumentally specific education and investigated a number of strategies for broadening undergraduate education by changing university curricula.

These included:

- delaying entry into professionally specific courses by requiring students to undertake a common first year of foundation study;
- expanding the scope for elective study so that students would be encouraged to study outside of their major discipline area;
- putting in place requirements that students undertake studies across a range of disciplines regardless of their degree;
- developing core general education subjects which all undergraduates would be expected to undertake; and
- enabling students to undertake dual or double degrees.

Some of these options were canvassed earlier (Candy, Crebert and O'Leary 1994) in relation to developing the capacity of undergraduates to become lifelong learners. A number of Australian universities implemented aspects of these strategies (Rosenman 1996); nonetheless universities continued to offer instrumentally specific education and it proved very popular with students throughout the decade.

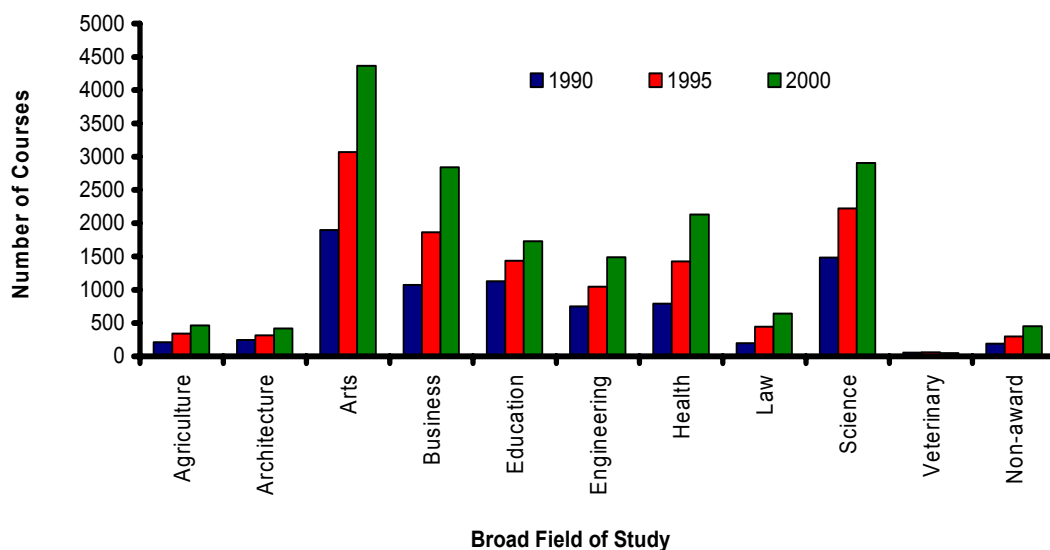
Greater choice of courses and specialisations

The 1990s was a period of fiscal constraint for most universities. However, universities were able to charge fees for overseas students and students studying for postgraduate awards through postgraduate coursework, so there was a strong incentive for universities to increase their revenue by attracting greater numbers of international and domestic fee-paying students¹⁶. For these reasons, marketing and packaging of courses to target student expectations became more important.

Students' expectations were changing as a result of a number of factors. They were becoming more aware of their power as consumers, especially as they now contributed to the cost of their qualifications through the Higher Education Contribution Scheme (HECS) or directly through fees. The nature of the student body itself was changing. Greater numbers of mature-aged students were studying for higher education qualifications. Some were studying for the first time but many were likely to be mid-career professionals upgrading or extending their qualifications and likely to be particularly interested in vocational courses. More full time students were in paid employment and working longer hours. The American experience of the rapid growth of so called 'corporate' universities and specialist private providers suggested that a growing number of students were interested in vocationally oriented courses which enabled them to gain the knowledge they needed for their next job, or a qualification, in the minimum amount of time.

¹⁶ Universities were also able to offer places to undergraduate fee-paying students (once they had offered the agreed number of HECS liable places) but not many students chose this option.

Figure 2.1 Number of courses by broad fields of study (Total, all levels of courses)¹⁷



Source: Department of Education, Science and Training Statistical Collection

2.2 Courses

The number of courses available to students began to increase significantly at the end of the 1980s. By 1992:

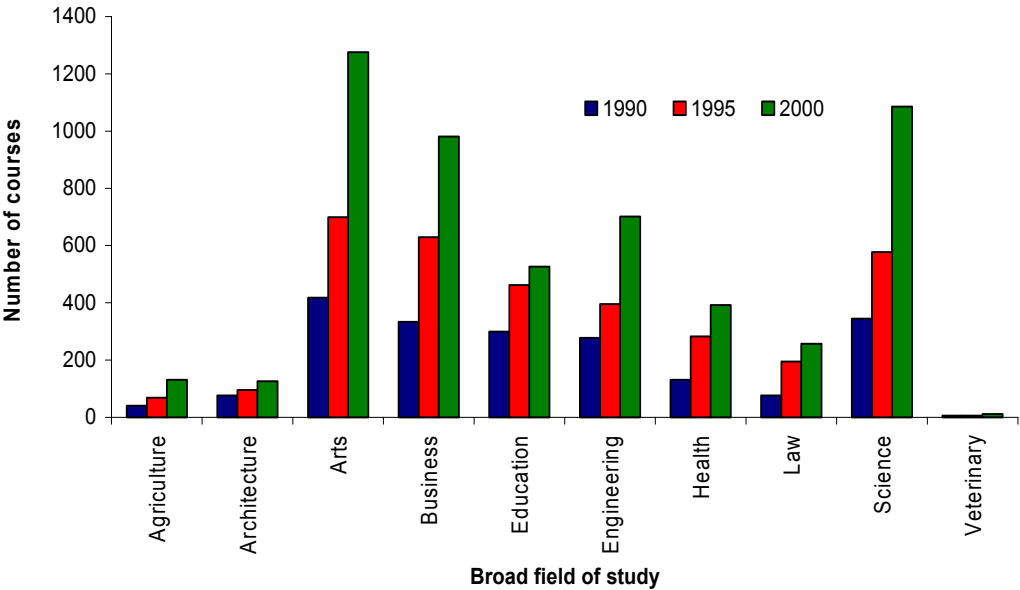
Australians had unprecedented opportunities for studying a vast range of subjects and courses in higher education institutions to satisfy their interests or lead to professional qualifications.

(Department of Employment, Education and Training, 1993, p. 163)

This was partly as a result of colleges of advanced education becoming part of the university system. As well as traditional professional fields like medicine, students could choose new areas of study such as acupuncture. In addition to generalist degrees like a bachelor of arts, students could choose new, highly specific degrees such as a graduate diploma in wastewater management, or a master of occupational health and safety, or a master of arts in Antarctic and southern ocean studies. However, as dramatic as these changes were at the time, they were overshadowed by the expansion of courses over the rest of the decade (Figure 2.1). For example, the number of courses in the arts broad field of study more than doubled in this time – from around 2000 in 1990 to over 4000 in 2000.

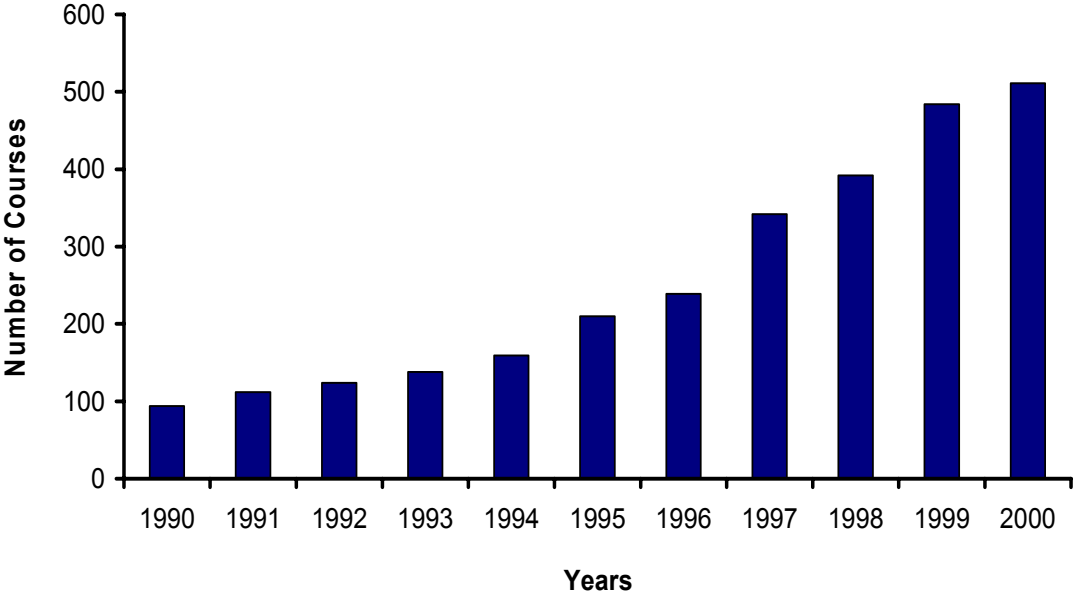
¹⁷ Note – figures given are indicative only as it is difficult to determine if specialisations with the same title are different when offered in different faculties or schools.

Figure 2.2 Number of courses by broad fields of study (Total, bachelor pass level)¹⁸



Source: Department of Education, Science and Training Statistical Collection

Figure 2.3 Number of Bachelor Degree Courses in Information Technology, 1990-2000¹⁹



Source: Department of Education, Science and Training Statistical Collection

¹⁸ Note – figures given are indicative only

¹⁹ Information technology fields of study include: Business Data Processing, Computer Science, Information Systems-General, Information Systems and Computer Science, Information Systems-Other Fields.

Table 2.1 Degrees and specialisations offered in the broad field of study – Science at undergraduate bachelor level

	1968	1990/91	2000/01
Science degree specialisations	24	27	78
Applied science degree specialisations	4	84	63
Health science degrees specialisations	0	4	22
Other degrees in broad field of study in science	0	8	36
Total	28	123	199

Source: Department of Education and Science 1968, Johnston 1989, Wall and Davies 2000

In fact, the expansion of courses at the bachelor pass level (Figure 2.2) was even more dramatic again, with the number of arts and science courses at bachelor pass level more than trebling over the decade.

The substantial rise in the number of courses in information technology at the undergraduate level, first noticeable in the mid 1980s, (Figure 2.3) reflects the accelerating level of activity, knowledge generation and interest in this area over the 1990s.

Specialisations

As the number of courses increased so did the number of identifiable specialisations available to students. For example, in 1968 there were around 20 identified undergraduate degree specialisations in the economics, business and administration field of study; by 1990 there were over 30 specialisations identified. Between 1991 and 2001 there was considerable growth of identifiable specialisations within bachelor of business courses (Table 2.2).

Table 2.2 Specialisations available within business bachelor degree courses²⁰

1991	2001
Accounting, business law and accounting,	Accounting, accounting and small enterprise management, accounting and finances, accounting and commercial law, accounting and electronic computing, commercial law, administration, Aboriginal affairs administration, human resources, public practice, business administration, economics, economics and finance, applied economics, banking and finance, financial planning, finance and risk management, management, operations management, transport and logistics management, tourism management, retail management, hotel management, catering and hotel management, restaurant and catering management, travel and tourism, tourism and hospitality, hospitality, tourism and enterprise management, regional tourism management, marketing, communication, industrial relations,
Personnel management, human resource management, public sector management, Financial management and economics, valuation and land economics, business systems, banking and finance,	
Marketing, public relations, industrial relations,	

²⁰ Figures for Table 2.1 and Table 2.2 are indicative only. They are based on entries for degrees which indicate students could specialise in a particular field, eg Bachelor of Science (osteopathy). They do not include those entries where it was simply indicated that students could take majors in particular areas.

industrial advocacy,
local government, international
business, agribusiness,

computing, information
technology, computers and
management, information
processing, information systems

small business, property, international
business, Asia Pacific studies, international
business management,
information management, computing and
information management, electronic
computing, business information systems,

Sources: Johnston1989, Wall and Davies 2000

Of course, undergraduate students have specialised in many areas in the past even if those specialisations were not specifically identified. The specialisations available to students have varied in response to student demand, the relevance of particular areas of knowledge at the time, and the expertise and interest of academics. To some extent, the increase in the number of specialisations available over the past decade appears to be simply the result of labelling or 'rebadging' courses to emphasise the way they provide pathways to employment or the development of particular expertise as well as to provide useful marketing labels. Nonetheless, a tendency towards greater specialisation was undeniable. For example, by 2001 the number of specialisations offered in science degrees had increased markedly (Table 2.1).

This growth was partly the result of increased interest in particular areas, especially those involving new developments, such as marine biology, conservation biology, molecular genetics, biotechnology, biomedical science, bioinformatics and nanotechnology. Over the decade, particular subjects became more popular and interest in others waned. More and more students chose to study in the administration, management, business, marketing, banking and finance fields, as well as psychology and medical science and, as to be expected, computer science and information systems. In 1990, 2.2 per cent of students were enrolled in the administration and management minor field of study. By 2000 this figure had risen to 4.1 per cent. The proportion of students studying arts, humanities and social sciences fell as did the proportion studying teaching and nursing. In 1990, 11.3 per cent of students were enrolled in the arts, humanities and social science minor field of study. By 2000 this had dropped to 9.3 per cent.

Changes in courses were also partly due to the end of the binary divide between colleges of advanced education. This divide was still apparent in the early 1990s. For example, in 1991, science degree specialisations were theoretical in orientation whereas applied science degree specialisations were focused on the practical aspects of science. This distinction had blurred by the end of the decade. In 2001 there was a considerable increase in specialisations identified in science degrees largely due to the offering of many more applied or vocationally oriented specialisations such as podiatry, sports science, physiotherapy, viticulture and oenology, ecotourism, environment and urban horticulture, corporate mathematics, and instrument technology. There was also a considerable increase in the specialisations identified in the health sciences, a significant growth area in the 1990s. In addition, there was a dramatic increase in the variety of degrees offered in the science area. In 2001, students could choose from around 40 bachelor degree science-oriented courses ranging from naturopathy, natural environment and wilderness studies, radiography and medical imaging, ergonomics, health information management, applied psychology, Antarctic studies to applied science and science degree courses.

This trend has been attributed to students taking a more 'instrumentalist' approach to their course choices and universities adjusting their offerings accordingly, yet evidence suggests that students were still choosing subjects because of their interest in them. In 1999, students' reasons for enrolling in university straddled both the pragmatic and academic domains, as they did in 1994 (Table 2.3) (McInnis, James and Hartley 2000).

Table 2.3 Reasons for enrolling in university

Reason	Year	Important (%)
Studying in a field that really interests me	1994	94
	1999	96
To improve my job prospects	1994	84
	1999	86
Developing talents and creative abilities	1994	74
	1999	73
The expectations of my parents and family	1994	25
	1999	23
Few other opportunities because of the poor job market	1994	18
	1999	18
Being with my friends	1994	10
	1999	14

Source: McInnis, James and Hartley 2000

Students were no more vocationally oriented in their reasons for attending university at the end of the 1990s than they were in the middle of the decade. Interestingly, a 1964 study of undergraduates attending the University of Sydney found that their predominant reason for coming to the university was to receive training in a profession (almost 70%) with only around 15 per cent reporting that their chief reason was to gain a broader cultural education (Martin 1965, vol III, p. 3) (Table 2.4).

Table 2.4 Survey of Sydney University Undergraduates 1964

Reason	Undergraduates (%)	Graduates (%)
Training for a profession	69	60
Broader cultural education	15	19
Both professional and cultural	10	8
Parental pressure	2	5
Other reasons, no response	4	8

Source: Martin 1965

Greater demand for additional qualifications

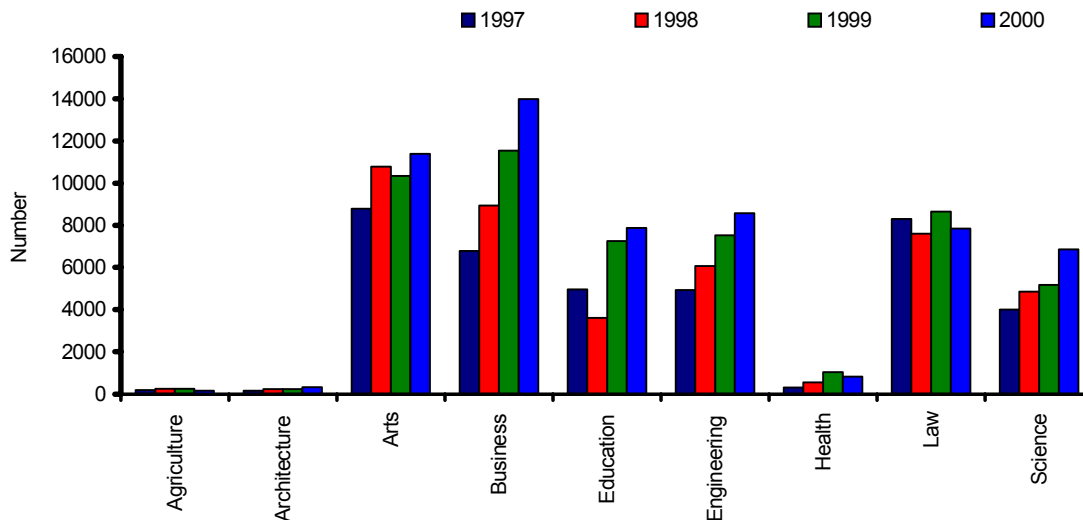
Over the 1990s there was a growing trend for students to seek additional qualifications over and above a standard bachelor pass degree. More and more people opted to study simultaneously for two bachelor degrees, or to go back to university later to obtain a second bachelor degree or a postgraduate qualification. Not only did the past decade represent a time when more Australians than ever before obtained a bachelor degree but it was also a time when far more Australians than previously obtained additional higher education qualifications.

Double degrees

In 2000, around 11 per cent of all domestic undergraduate students studied for a combined or double degree. With a double degree, students elect to study two separate courses and receive two qualifications at the end. Although many double degrees take five years or longer (especially if one of the combinations is a law degree) it is possible to complete two single three-year degree courses in four years by combining them. For example: a bachelor of business administration and a bachelor of management; a bachelor of science and a bachelor of commerce in accounting; or a bachelor of commerce in banking and finance

and a bachelor of information technology. Combining a business degree with another degree was the most popular option in 2000 (Figure 2.4).

Figure 2.4 Numbers of all students doing double or combined degrees by broad field of study 1997-2000²¹



Source: Department of Education, Science and Training Statistical Collection

As the comments of two female university students quoted below suggest, double degrees can provide a mechanism for students to satisfy both their intrinsic interests and their more pragmatic needs. The double degree option can also provide a broader education which equips students for more than one career path.

I just wanted to keep on doing my language, and I was more interested in the Arts side of my degree, but then I thought of employment and stuff and I thought this (double degree) would help me get a better edge on employment and increase my options.

Double degree studies provide you with a "hard" side – as far as economics and number crunching – and a "soft" – as far as the political economy – so I think you come out with a pretty good balance rather than having just one or the other. When you do economics or accounting you either understand it or you don't: statistics is definitely an example of that! Whereas in political subjects, you can just keep reading and reading and reading and it's just a never-ending path of discovery really. It's interesting: I think it challenges both sides of the brain.

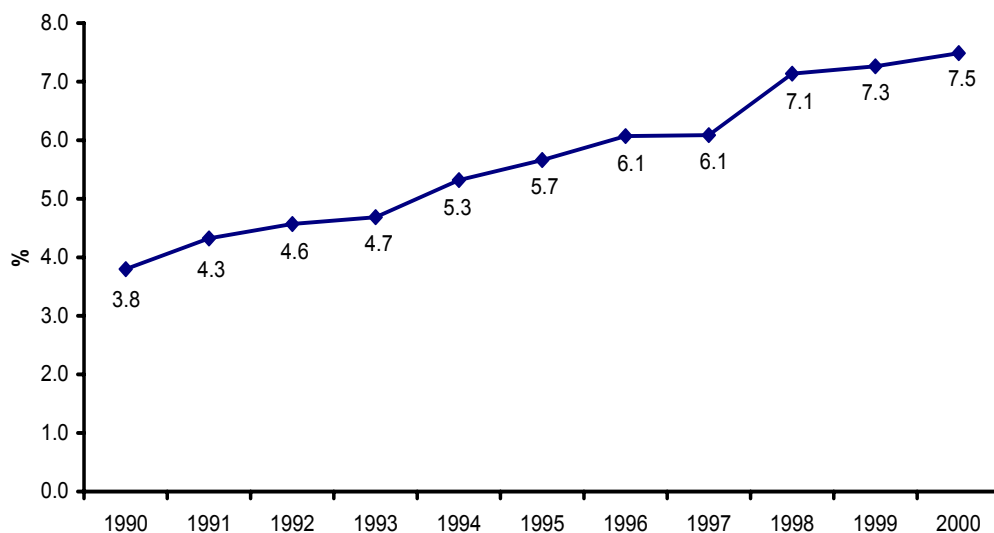
(Batson et al. 2002)

²¹ The graph shows trends from 1997 onwards as data from 1997 onwards as data from 1997 onwards was compiled in a different way from prior years to allow for the coding of combined courses to two fields of study. It includes both domestic and overseas students. The most popular area of study for overseas students was business, administration and economics (1,002 overseas students in 2000) and engineering and surveying (536 overseas students in 2000).

Second degrees

There was also a steady increase in the number of people commencing undergraduate courses who already possessed a previous higher education qualification. The proportion of students commencing bachelor degrees who already possessed a bachelor degree rose significantly, almost doubling over the decade (Figure 2.5).

Figure 2.5 Proportion of domestic students with a bachelor degree commencing their second bachelor degree²²



Source: Department of Education, Science and Training Statistical Collection

Postgraduate qualifications

Over the past decade there was also significant growth (36% overall) in the number of students studying for postgraduate qualifications through coursework. This growth was generally strongest in those areas where the content of the courses was vocational. For example, the number of domestic students undertaking postgraduate qualifications by coursework in business, administration and economics increased by almost 100%, whereas, the number of students undertaking postgraduate qualifications by coursework in the arts, humanities and social sciences increased by just over 30% overall (Table 2.5) and actually declined between 1995 and 2000. The number of students undertaking postgraduate study by coursework in the health area increased almost threefold over the decade but the number of students undertaking postgraduate studies by coursework in education declined by over 25%. Other areas such as engineering and surveying, architecture and building and veterinary science remained relatively static. All During the 1990s, Australian universities were particularly successful in attracting overseas students and there was a significant increase in the number of overseas students studying for postgraduate qualifications (Figure 2.6) especially in the business, administration and economics field. While the number of domestic students undertaking postgraduate studies by coursework grew significantly earlier in the decade, between 1995 and 2000 the numbers fell.

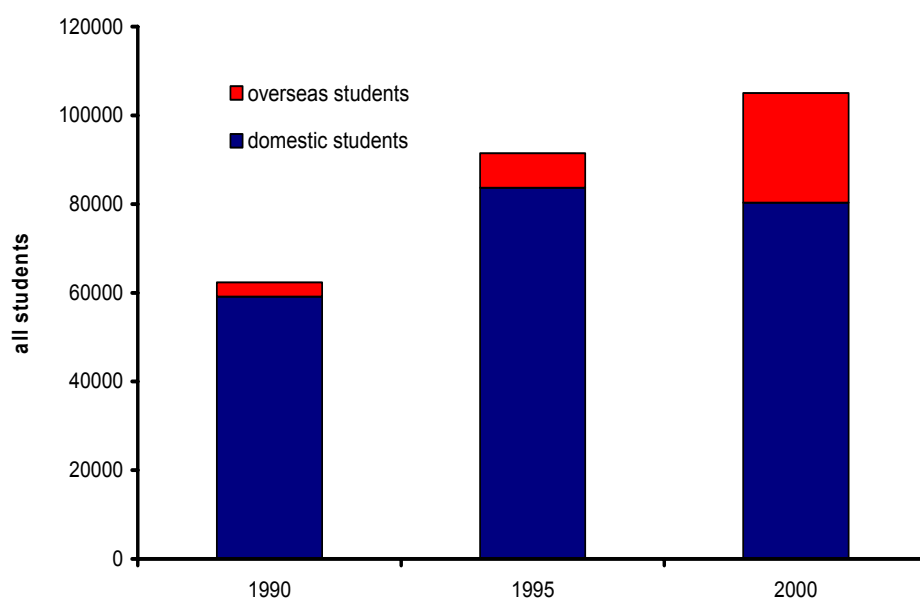
²² Bachelor degree course includes bachelor pass, bachelor honours and bachelor graduate entry courses.

Table 2.5 Domestic students undertaking postgraduate studies²³ by coursework

All domestic postgraduate by coursework students by broad field of study	1990	1995	2000
Agriculture, Animal Husbandry	263	606	427
Architecture, Building	1373	1592	1516
Arts, Humanities and Social Sciences	8832	13910	11628
Business, Administration, Economics	12768	21496	25389
Education	21015	20369	15269
Engineering, Surveying	2524	3436	2456
Health	4353	11530	12400
Law, Legal Studies	2517	3505	3334
Science	5458	7146	7961
Veterinary Science	41	60	63
Total	59144	83650	80311

Source: Department of Education, Science and Training Statistical Collection

Figure 2.6 Students undertaking postgraduate studies by coursework



Source: Department of Education, Science and Training Statistical Collection

The decline in the numbers of domestic students undertaking postgraduate studies after 1995 can be attributed to a reduction in the number of fully funded places at the postgraduate level in the latter half of the decade. In 1996, the Commonwealth announced reductions in the forecast growth in the forward estimates for universities' operating grants of one, three, one and one per cent against previously announced levels in the years 1997, 1998, 1999 and 2000 (Department of Education, Training and Youth Affairs 1997). In line with the Government's priorities these reductions were predominantly taken at the postgraduate level, as can be seen in Table 2.6. Despite the overall reductions in fully funded places, the number of undergraduate places continued to grow.

²³ Includes: graduate certificate; graduate diploma/postgraduate diploma extending skills and knowledge in a professional area previously studied; graduate diploma/postgraduate diploma involving new academic, professional or vocational area; postgraduate qualifying or preliminary (for master's, doctorate or higher doctorate); master's by coursework; doctorate by coursework.

Table 2.6 Fully funded places expressed as equivalent full time student units (EFTSU) 1994-2000

	1994	1995	1996	1997	1998	1999	2000
Total places	403,010	410,475	417,395	419,570	412,555	412,950	411,160
Undergraduate places	342,590	346,605	351,735	357,670	361,925	364,395	365,920
Postgraduate places	59,090	62,495	64,250	60,485	49,250	47,110	43,640
Other ²⁴	1,330	1,375	1,410	1,415	1,380	1,445	1,600

Source: Department of Education, Science and Training Statistical Collection

Greater professional orientation

Over the past decade, universities responded to increasing demand for courses that provided pathways to a career or improved employment opportunities by developing more courses with strong links to industry or professional organisations (see Box 2.1). Many universities introduced practicums as integral course components to help students develop and focus on the skills necessary in professional practice. Courses were tailored to meet the professional requirements of students and some courses enabled students to gain professional qualifications as well as university degrees, diplomas or certificates.

An example of a course designed to prepare graduates for employment in a specific industry was the collaboration between Charles Sturt University, Microsoft and Dimension Data Learning Solutions to develop a course to enable students to gain a Bachelor of Information Technology from Charles Sturt University as well as Microsoft qualifications. The components of the course build on each other and are designed to enable students to work in the industry as they study (Dimension Data 2002).

So in the 1990s, universities created new courses, modified old ones, aligned courses to particular professional qualifications and forged links with industry in order to meet student demand. They also modified the way courses could be accessed and put together in order to meet the needs of students increasingly fitting in study between work and frequently pursuing the achievement of specific goals in the minimum possible time.

Greater course flexibility

Over the 1990s a greater proportion of university students participated in paid employment (McInnis 2001 in Box 2.2). The increasing demands of this work meant that students tended to fit study around work rather than more traditionally fitting work around study and found it more difficult to stay on campus after lectures for social or study purposes. Greater flexibility in the way that they could access university and in the way courses were delivered was likely to be particularly attractive to these working students.

Given the work and domestic commitments of most adults, and the 'time poverty' felt by many people nowadays, it is not surprising that convenience of location and time scheduling, as well as brevity of a study program, or compression of study periods, have a major appeal to adult students.

(Cunningham et al. 2000, p. 110)

²⁴ These places, designated neither postgraduate or undergraduate, are allocated to only five institutions.

Box 2.2 The changing mix of student work and study loads

Craig McInnis, Centre for the Study of Higher Education, University of Melbourne

Working part-time has long been something of a rite of passage for undergraduates enrolled full-time in Australian universities. Full-time students have worked part-time either to support themselves financially, or to supplement their income from other sources. For many years students have been typically advised that somewhere around eight hours a week during term time was what they could reasonably be expected to cope with alongside their full-time study, and it was assumed that the long summer break would give them the opportunity to work full-time to accumulate some savings to meet their needs.

Anecdotal reports of students working more and studying less have been coming from academics for some time, but only in the last few years or so has there been any systematic data-collection on the changing work and study habits of undergraduate students. This shows clear evidence of a marked increase in the number of students enrolled full-time who are working in part-time employment over the past ten years, and for whom part-time work is the only or main source of income.

On average, full-time students in Australian universities are working part-time around 15 hours per week. Four out of ten students who are in paid employment are working more than 16 hours per week. These averages disguise major variations and extremes. For example around 18 per cent of full-time students work 21 hours a week or more in paid employment. On one estimate, the average increase in time spent on paid employment over the past ten years is close to 38 per cent.

In the first half of the 1990s almost 80 per cent of commencing students spent four or five days on campus. By the end of the decade, this had declined significantly with ten per cent fewer students on campus for five days a week and an increase of about the same proportions spending just three days a week at university. For a growing number, the nature of part-time work in which they are involved has changed from one or two nights a week and a regular four or five hours on weekends to any time during the week—night or day. The dynamics of part-time work vary across major sub-groups of full-time students. For example, the proportions of younger students, primarily school leavers, has shown the largest increase in the numbers in paid employment over the last half of the 1990s.

For younger full-time students, the impact of paid work on their university life and study is greatest. The more hours students work in paid employment, the more likely they are to spend less time on campus, to have fewer class contact hours, and not to work with other students on their studies. They are also more likely to anticipate getting lower marks, study inconsistently through the semester, and to seriously consider deferring.

Students who work excessive hours are currently given little choice but to squeeze their full-time study into a form that allows part-time work. They are tempted to make choices based on convenience rather than personal interest or their potential to succeed. The array of work-compatible courses in some universities, especially in professional areas is limited. It is still almost impossible to study some areas part-time. Many professional courses are still configured on the assumption that the bulk of students will be enrolled full-time with an expectation that they will be able to meet the obligations of high contact hours and demanding assessment schedules.

The relationship between paid work and academic performance is not as clear as it might seem. Students who are at risk of failing or discontinuing their studies frequently cite excessive work hours as a contributing factor. However, it is unusual for this, or any other factor, to be the sole

reason for students getting into difficulties: it tends also to be associated with choosing the wrong course and a subsequent loss of motivation.

Younger students who live at home and are not in part-time employment are in general more dependent, less oriented to the demands of study, and less at ease with the expectations placed on them. This suggests that working at least some hours concentrates the mind when studying, and that students are then more likely to be more efficient and effective in the way they manage their lives. Further, those with the greatest number of hours available to study, actually have lower levels of academic application than those working over 10 hours each week. Likewise, being strongly academically oriented, that is, enjoying the intellectual challenge of study, does not necessarily equate with studying in a stereotypical consistent and orderly pattern. However, students who are not living at home and are working to meet basic living expenses are most at risk. The combination of work and worry about not keeping up with study, and the unpredictability of the self-supporting student life, can have a cumulative and compounding negative effect.

The increase in the amount and type of part-time work is creating major challenges for academics and universities, and there are many unanswered questions in the now rapid process of change still working its way through the design and delivery of the undergraduate experience. In the early 1990s academics were already complaining about the pressure on them to accommodate student demands to negotiate extended timelines for the submission of assessment tasks, to change class timetables, and to tolerate patchy attendance levels. Ten years later, the reported declines in lecture attendance and the greater opportunity for part-time work, is, somewhat ironically, the outcome of making lecture notes and course materials available online for on-campus students. There is little to indicate how this pattern might best be resolved.

Finally, the impact of the changing mix of study and work loads on the organisation of teaching and learning, and on the design and use of university infrastructure, facilities and resources is also by no means clear. There have certainly been major changes proposed in some universities in the way the annual calendar is managed, and much of this activity is still in a state of experiment and flux. Issues of curriculum coherence and the impact of greater flexibility in course design and sequencing raise questions about the impact on learning outcomes and graduate qualities.

In the early 1990s, the Commonwealth encouraged universities to increase the flexibility of their course structures, length and delivery so that prospective students, especially professionals wanting to update or upgrade their professional skills and knowledge in specific areas, had more options for entering and exiting higher education (Baldwin 1991). Greater flexibility was also seen as the key for enabling lifelong learning because it enhanced the ability of people to come and go from university studies to suit their own circumstances and requirements (Department of Employment, Education and Training 1993). As a result of the need to provide students with more flexibility, universities began to explore a number of alternatives to traditional three-year undergraduate degrees.

Summer terms

Summer terms were introduced by many universities, although initially only small numbers of students enrolled in formal units, mostly in the business, economics and administration field of study (Table 2.7). However, the student load in summer terms has increased almost tenfold since 1990 and represents a significant activity for universities over what was traditionally the end of year/new year break.

Table 2.7 Actual Student Load (EFTSU) for all Students by Semester, 1990 to 2000

Sem.	Year										
	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
1	195,272	215,482	223,682	228,518	230,966	237,744	249,684	262,634	268,066	274,209	278,237
2	180,085	205,311	207,157	210,314	211,249	221,433	234,080	246,401	252,823	259,456	263,106
3	1,165	1,769	2,165	2,253	2,191	2,910	4,212	4,850	6,793	9,037	10,958
4	0	0	0	0	0	0	0	666	907	1,223	4,142
5	0	0	0	0	0	0	0	177	248	218	1,320
Total	376,522	422,563	433,005	441,085	444,407	462,087	487,977	514,727	528,838	544,143	557,763

Semester 3 is the summer semester between the end of one standard academic year and the start of the next. Semesters 4 and 5 are non-standard semesters within the academic year.

Source: Department of Education, Science and Training Statistical Collection

Many universities offer short courses and compressed units or single courses from their accredited degree or postgraduate programs in the summer semester. Such courses provide opportunities for students to: sample tertiary study before starting an undergraduate degree; gain professional qualifications; or accelerate their degree program. One university found that the main motivation for study in the summer was the early completion of courses and that the shorter, intensive nature of summer courses was a particular boon to many part-time students (University of Queensland 2001a). Increasingly, the summer semester has become an important part of university life rather than peripheral to it. At Bond University, for example, the summer semester is an integral part of the academic year and as a result students can complete their bachelor degrees in two years instead of the standard three years, and a number of three-semester coursework masters programs can be completed in twelve months (Bond University 2001).

Graduate certificates and diplomas

The introduction of graduate certificates and graduate diplomas by universities in response to the Dawkins' White Paper (1988) addressed the needs of people seeking to upgrade or update their professional skills. The coursework for these qualifications often built on professional knowledge gained through work as well as previous study. Furthermore, the fact that many graduate certificate courses formed half of a graduate diploma, meant that students had the option to complete the higher award. Likewise, graduate diplomas could articulate into masters degrees.

The development of these awards took place in the context of a growing pool of people with undergraduate qualifications who might be attracted to further study, rapid changes in some areas resulting in new or expanded fields of study and the development of new courses. The graduate certificate and diplomas also provided alternative pathways into university for small numbers of people who had no previous university qualifications. Over the decade the number of domestic postgraduate students who were new to higher education increased from 2,368 students in 1990 to 4,040 in 2000.

Modularisation

In 1990, the Higher Education Council proposed the introduction of modules that students could choose to suit their particular needs and the Council suggested that students should be able to aggregate such modules to satisfy degree requirements if they wished (Higher Education Council 1990)²⁵. There was some opposition to this approach because the concept of free standing units or modules that could be assembled by students as they wished was an anathema to the traditional view of university curriculum as a coherent and thoughtful integration of knowledge, skills and attitudes which would impart a specialist understanding of a discipline area as well as develop an individual's full potential.

²⁵ This issue is also discussed in chapter six on quality assurance.

In reality, universities often abandoned this more coherent approach in response to staff demands to teach specialist topics and student demands for wider choice (Cunningham et al. 2000). Indeed, according to Candy, Crebert and O'Leary (1994) the concept of 'curriculum' in the university setting was unfamiliar to many academics, who developed and taught units or courses to reflect their own research interests with little attention to ensuring coherence or identifying the aims and objectives of teaching.

Nonetheless, the Higher Education Council itself recognised that there was a danger that a modularised system could produce a rather superficial and piecemeal education and some professional associations, which played a significant role in university course approvals and review, teaching and assessment, opposed modularisation and insisted on set curricula (Cunningham et al. 2000).

Despite these fears, at the end of the decade, modularisation had not been adopted on a large scale at the undergraduate level. An examination of half a dozen university handbooks for undergraduates for the year 2000 covering courses in the arts and humanities field found no mention of modules. While students could choose from a wide range of subjects and take particular subjects that appealed to them, they were still required to build courses with specific components, prerequisites were stipulated for most units and some courses allowed no choice of units. The general structure for bachelor of science and bachelor of medical science courses that resulted from a revision of science courses at the University of Technology Sydney in 1997 is fairly typical. It consists of:

- a core discipline strand consisting of the prescribed subjects that define the course and form the basis for professional recognition;
- a variable number of prescribed core support subjects which underpin the core discipline strand but which may not contribute directly to the requirements for professional recognition;
- a second major component comprising a coherent set of subjects from within or outside the faculty of science; and
- free electives.

(University of Technology Sydney 2000, p. 37).

At the end of the decade, undergraduates were still generally required to study a set number of common core subjects as well as core subjects specific to their area of specialisation. Nonetheless, modularisation of the curriculum did occur to some extent in postgraduate studies by coursework, and was even taken on board by some professional associations. For example, the Association of Professional Engineers, Scientists and Managers, Australia now offers short courses that are essentially modules which students can assemble and build upon to achieve a postgraduate award (see Box 2.3). Modularisation is probably best suited to postgraduate studies where most students have already built up some expertise in the area of study either through previous study or their work experience, although El-Khawas (2000) sees balancing the need for degree programs to be coherent and yet increasingly modular as one of the key challenges for the future.

Box 2.3 Professional association offers higher education awards

The Association of Professional Engineers, Scientists and Managers, Australia (APESMA) offered a short course program in 2001 that included 18 courses that provided a pathway into postgraduate management studies. The short courses were specifically designed for technologists in the engineering and science fields and covered traditional management skills and competencies such as leadership and team performance, financial and contract management, as well as emerging issues such as e-business systems, intellectual property and technology asset management and outsourcing. They were also provided in a condensed program covering specific management issues and skills.

The short courses can be used as credit towards other postgraduate management education courses offered by the association including a graduate certificate with a range of specialisations, graduate diploma, MBA – all jointly conferred with Deakin University and a DBA which is offered with Charles Sturt University. Three short courses give a one unit credit in a graduate certificate which is made up of four units altogether. The short courses are recognised by the Institution of Engineers Australia, the Australian Computer Society, the Royal Australian Chemical Institute and the Australian Institute of Agriculture. In line with the association's philosophy to provide flexible education the courses are offered as either a two day instructor led course or online over the Internet where students have 12 weeks to complete the program. (*Campus Review* 25-31 July 2001, p. 17)

Flexible Entry Requirements

In the 1990s, most universities had flexible entry requirements which allowed multiple pathways into university. Students could gain entry to university on the basis of their performance at school, either straight from school or as mature age students.

In addition, some universities provided access schemes for school leavers who had good academic potential but were unable to study the course of their choice because their education had been disrupted or disadvantaged whilst at school (University of Canberra 1999). There were also special provisions for Aboriginal and Torres Strait Islander people. Students could also gain entrance on the basis of their previous performance at tertiary institutions, not just universities but also colleges of technical and further education. At the end of the decade there was less reliance on satisfactory completion of schooling as the basis for admission to higher education (Table 2.8).

Table 2.8 Proportion of domestic students commencing a bachelor degree or below by basis of admission to higher education

Basis of Admission	1990 %	2000 %
Satisfactory completion of final year of secondary education at school	54.1	46.2
Incomplete higher education course	10.8	14.7
Completed higher education course	8.9	8.9
Mature age or other special provisions	9.4	7.6
Complete or incomplete TAFE (other than secondary education course)	2.9	6.6
Examination or assessment by institution	2.4	5.5
Employment experience, professional qualification or completion of Open Learning studies	2.7	2.5
Satisfactory completion of final year of secondary education at TAFE or other institution	1.4	0.5
Other basis	6.8	7.3

Source: Department of Education, Science and Training Statistical Collection

Over the 1990s, the boundaries between courses offered by vocational education and training institutions and universities blurred. The vocational education and training institutions had moved a long way from the days when they largely offered courses for apprentices. The sector had grown significantly and courses covered a wide range of areas which overlapped with some of the more vocationally oriented courses offered by universities. Articulation of vocational education and training courses with university courses allowed students to move more easily between the sectors (Table 2.9). Box 2.4 gives some suggestions as to why this option was attractive to students.

Table 2.9 All commencing students converting prior TAFE qualifications into credits towards university degrees

	1990	1995	2000
Number out of all commencing students	923	4737	6143
% of all commencing students	0.5	1.9	2.1

Source: Department of Education, Science and Training Statistical Collection

Box 2.4 An example of integrating TAFE and university courses

'The first graduates from a unique program that allows students to gain a Holmesglen TAFE diploma and a Charles Sturt University degree while continuing to study at Holmesglen recently celebrated their success. The joint arrangement allows students to begin studies in three degrees – business, IT and hospitality management – after they complete a TAFE diploma in a related area.

For bachelor of business graduate Cheung Shing Ma, his philosophy that "time is money" was the guiding principle in choosing the double badged qualification which can be completed in three years. Kam Fong Lau, who relocated from Hong Kong to Melbourne to study, said the course allowed her to gain a diploma of business in banking and finance as well as a bachelors degree. Arthur Kondos said he chose the course because of its broad subject focus and small class sizes.

Director of Holmesglen's International Centre, David Endean told *Campus Review* the joint program appealed to both domestic and international students because it combined practical elements with theory and was also extremely cost-effective. International students pay \$8,200 a year ... Domestic students pay \$550 a year for the 18-month TAFE component of the course, far less than if they were studying at university for the full three years.

After students complete a TAFE diploma they enrol in a CSU degree that is taught on-campus at Holmesglen but assessed at CSU. While studying the CSU component, students have access to the university library as well as other CSU learning materials. ...'
(Jacqui Elson-Green 2001, p. 1)

During the 1990s, the Commonwealth encouraged flexibility and mobility between sectors and funded a number of projects aimed at facilitating credit transfer. In 1995/1996 it funded the Australian Credit Transfer Agency to assist prospective students in gaining credit for prior learning. Credit could be given for prior credentials gained through an Australian university, technical and further education institution or private provider or for uncredentialed learning gained through work or life experience (Department of Employment, Education and Training 1996). The agency operated on a cost recovery principle, however, lack of demand meant that it was not viable. Nevertheless, interest across sectors in credit transfer and recognition of prior learning has continued with a project commissioned by the Australian Qualifications Framework

Advisory Board in 2002 to survey current recognition of prior learning policy and practice within and across the sectors and to develop a set of common principles for recognition of prior learning to augment national, cross-sectoral policy development.

There was considerable variation in the extent to which different universities used the various admission options available. For example, in 2000, one university admitted three quarters of its students on the basis of their satisfactory completion of the final year of secondary education at school whereas another institution only admitted 15 per cent of its students on this basis. Some universities also admitted prospective students with no prior formal qualifications providing they could satisfy the university that they had a reasonable likelihood of success. In some cases it was possible to gain admission on the basis of substantial work experience in a particular area or on the basis of an examination or assessment by the institution although a number of universities did not admit any students in these ways. Some universities set no subject pre-requisites to restrict students' choice of courses although they assumed that beginning students had some prior knowledge of the subject. Such an open entry policy contrasts with other universities that stipulate quite stringent entry requirements and rank all applicants to determine their relative merit for an offer of a place. This seeming dichotomy may follow a trend that is becoming more evident in the United States of America whereby some universities admit all interested students, offer courses in a wide range of fields of study, and use a variety of different learning and delivery modes whereas other universities are making conscious choices to attract a certain kind of student, to offer only some fields of study and to limit their geographic markets (El-Khawas 2000)

Overall, at the end of the decade students had many more study options. There was a range of pathways to university and on to professional careers, including via technical and further education. Students had greater choice in the way they could assemble units into courses and how courses could be articulated into a sequence to give progressively higher qualifications. It is not quite so clear as to how the actual content of courses changed over the 1990s although there are some trends observable.

Changes to curricula

Many of the changes in curricula that occurred in the 1990s reflected the response of universities to the knowledge explosion taking place in various areas, particularly as a result of rapid developments in information and communications technology. Many of the new areas of learning that gained prominence had multidisciplinary aspects and universities took this on board, creating courses that crossed traditional discipline boundaries. In the more competitive environment of the past decade universities were also keen to emphasise that their courses provided pathways to careers and that content was targeted to develop professional knowledge and skills. Universities also recognised the need for course content to be structured in a way that enabled students to build on previous learning and to gain progressively higher qualifications. Change in curricula also resulted from an increased awareness of the importance of teaching and learning strategies, the need to improve the learning experience of students and to develop the generic skills desired by employers.

The field of geomatics illustrates some of these changes. It is an area of study in the spatial information sciences that has developed over the decade as a result of an explosion of ideas and technology (such as geographic information systems, global positioning systems, remote sensing, image processing and digital photogrammetry) which has revolutionised surveying and opened up new professional careers (University of Tasmania 2001). The four-year bachelor degree course reflects these fundamental changes and is not simply a surveying course with a few additional units tacked on to cover recent developments. The degree is recognised by the Institution of Surveyors, Australia for graduate membership. Students undertake a minimum of 20 weeks professional experience in their final year that can be counted towards the professional experience required for registration as an authorised surveyor. Students who have completed a TAFE Associate Diploma of Applied Science (Surveying) can receive credit for

25% of the degree course requirements. The course also aims to develop generic skills such as appropriate scientific analysis, problem solving and design skills, and appropriate communication skills.

Box 2.5 provides some additional examples of courses and specialisations that, while they might have some units from more traditional courses especially in first year, are essentially focused on new areas of knowledge.

Box 2.5 Examples of courses covering new areas

Bachelor of electronic commerce

E-commerce only really became a reality in the 1990s with the advent of the Internet. The bachelor of electronic commerce offered by the Australian National University draws on material from the faculty of economics and commerce and the department of computer science. It covers:

- Business and commerce theory and practice, including accounting, marketing and legal knowledge.
- E-commerce and technology knowledge, to support the development of e-commerce systems and solutions in business, including strategic planning, systems analysis and design and basic knowledge of programming, databases and networks for e-commerce.
- Human and societal issues, including project and change management, human factors in computer use, adoption behaviour, ethical, legal and security issues in e-commerce, and societal impacts.

(Australian National University 2001a)

Bachelor of bioinformatics

Bioinformatics is an interdisciplinary area aimed at analysing and utilising biological information. A huge amount of biological data relevant to the evolution and functions of organisms is being constantly generated, which requires fast and efficient ways of processing which has been facilitated by advances in computing and software technologies. Bioinformatics provides insights into the processes of life based on information obtained by experimental biologists and medical researchers. The analysis of this data is used for furthering knowledge in life science leading, for example, to improve drug design and population health.

(Australian National University 2001b)

Bachelor of photonics

Photonics is the study of the use of light to transmit, store and sort information. It is the technology which underpins the information revolution and is one of the fastest growing industries worldwide, largely driven by the demand for the large bandwidth that is required for data transmission and Internet services. The three year bachelor of photonics degree is designed specifically as preparation for a career in this field. It starts off in the first year with some standard science units, in second year some of the units are clearly related to a study of light and telecommunications and more specialised training in 'state of the art' photonics technology takes place in third year. The syllabus was developed in close consultation with the photonics industry and research centre to ensure that it includes material relevant to the most recent developments in, and the rapidly expanding applications of, photonics.

(Australian National University 2001c)

Arts Degree (Digital Arts)

Digital Arts can be defined as art works produced using digital technology. This encompasses fields of activity such as computer animation, digital video, interactive multimedia and computer music. As digital technology advances the lines between different disciplines and genres are becoming increasingly blurred. The skill set required of the digital artist has broadened as genres redefine and mingle. Today's digital artist requires a firm grounding in digital imaging, digital sound production, Internet technologies, critical theory and cultural context. In addition to

the Digital Art subjects, in each semester students take one theory unit and one practical complementary study unit chosen from those offered by the Canberra School of Music and the Canberra School of Art.
(Australian National University 2001d)

Other new courses developed in the 1990s reflected growing interest in particular fields of knowledge, such as tourism or viticulture, perhaps due to their growth potential and therefore possible economic spin-offs and increased career prospects (see Box 2.6).

Box 2.6 Bachelor of Tourism

The bachelor of tourism degree offered by the University of Tasmania provides an in-depth examination of tourism. According to the university, the degree provides an overview of tourism as a field of human activity, and examines tourism as a system rather than simply as an industry. Students receive a solid grounding in the areas of wilderness and heritage tourism with opportunities in other areas such as marketing, management, economics, information and indigenous tourism. Unlike some degrees in which specialisation occurs towards the end of the course, designed as it is to provide a specific course of study for students considering a career in the tourism industry, it has a strong tourism focus right from the very beginning. In Year 1 students study Foundations of Tourism A and B, Tourism Geography, Australian Tourism Typologies. In Year 2 they study Sustainable Tourism, International Issues in Tourism, Eco and Nature based Tourism and in Year 3 they study Tourism Policy and Planning, Tourism Project and Antarctic Tourism. As was becoming more common over the decade, the course articulates with the vocational education and training sector so that students who have completed a TAFE Associate Diploma or a Diploma in tourism-related subjects can apply for credit towards the bachelor of tourism degree course.

The bachelor of tourism course includes units from the faculties of arts, commerce, and science and engineering (e.g. psychology and architecture), and is indicative of a trend to a more multi-disciplinary approach to courses evident in the past decade.
(University of Tasmania 2001)

There is some evidence of an increase in courses offered by universities that were essentially multi-disciplinary in nature.

For example, the Bachelor of Antarctic Studies with Honours course introduced in 1990 by the Cooperative Research Centre for Antarctica and the Southern Ocean at the University of Tasmania covers aspects of a number of disciplines. Students undertaking the course must have already completed a pass bachelor degree, but not necessarily in science. In first semester they study units on physical science, biological science, law, policy and international issues and Antarctic operations. The course is a collaboration between specialists in different fields. Lectures are delivered by a large number of visiting experts as well as in-house lecturers. In second semester students prepare a thesis in their particular area of speciality and this requires the university to have a large number of specialists in different fields available as research supervisors.

Some curriculum developments in the 1990s resulted not only in courses that contained new material but also used new approaches to structuring courses, teaching and learning and assessment. An example is the Master of Virtual Communication offered by RMIT University which covers global collaboration and taking products and services to the e-market. Graduates of the course are expected to manage e-communication for joint ventures and projects within and between organisations globally and also to design and develop communication strategies in a competitive global market. Students are guided by industry-based lecturers and learn through a combination of face-to-face master classes, workshops and online conferencing. Students learn in virtual project teams and have the opportunity to work with people from a global network of educational institutions. Every course in the program has a collaborative project for

assessment, and students use tools for synchronous and asynchronous²⁶ communication (RMIT University 2000).

Graduate attributes

Work on identifying the desirable attributes of graduates, such as critical thinking and communication skills, that would enable them to perform effectively in the workplace, began in the early 1990s in several universities. By 2001, all Australian universities had embraced the specification of graduate attributes, however, the comprehensive integration of those attributes into the curriculum was adopted with varied enthusiasm and commitment (Gallagher 2000). It was clear that these generic skills would not necessarily be developed using a knowledge dissemination model of university teaching and that universities would need to examine closely their teaching and assessment practices if they were to be sure that their graduates indeed developed these desirable attributes.

A number of universities embraced the process (see Box 2.7), and professional bodies, such as the Institution of Engineers, sought to ensure that educational programs demonstrated an appropriate balance between technical competency and generic capabilities such as teamwork, leadership, effective communication, critical thinking, problem solving, creativity and ethical practice (Bowden et al. 2000). The Business/ Higher Education Round Table (BHERT) examined ways to develop the entrepreneurial skills of higher education students (BHERT 2001). There was an impact on teaching and learning with some universities moving to more student-centred, outcomes-based or problem-based learning (Bowden et al. 2000). University course documents reflected a greater focus on generic skills with stated intentions, such as to develop analytical and problem-solving skills, excellent communication, team-based and leadership skills and a capacity and motivation for continued life-long learning.

Box 2.7 Attributes at the University of South Australia

At the University of South Australia all students are expected to leave the University demonstrating a set of graduate qualities that will be valued by employers and the community. The University's approach to teaching and learning is flexible, student-centred and technologically focused. Student performance is measured not only against the traditional measure of mastery of a body of knowledge but also against the graduate qualities or attributes. The University's Statement of Graduate Qualities developed in 1995 declares that a graduate of the University of South Australia:

- operates effectively with and upon a body of knowledge of sufficient depth to begin professional practice;
- is prepared for lifelong learning in pursuit of personal development and excellence in professional practice;
- is an effective problem solver, capable of applying logical, critical and creative thinking to a range of problems;
- can work both autonomously and collaboratively as a professional;
- is committed to ethical action and social responsibility as a professional and a citizen;
- communicates effectively in professional practice and as a member of the community;
- demonstrates an international perspective as a professional and as a citizen.

The systematic embedding of these qualities within the teaching and learning environment is a continuing priority for the University. The student Recording of Achievement Programme enables students to record their achievements against the seven graduate qualities. Implementation of monsterTrak, a global virtual careers service linking Recording of

²⁶ Synchronous communication involves communication in real time such as video-conferencing. Asynchronous communication is communication that does not involve interaction in real time, for example, responding to an email sent earlier.

Achievement of the graduate qualities to TMP's international databases, is underway. The University's Flexible Learning Centre has also developed extensive resources for staff to enable them to effectively build the graduate qualities into the curriculum for specific courses and programmes.

(University of South Australia 2001a)

By 2000, a voluntary national Graduate Skills Assessment developed by the Australian Council for Education Research and funded by the Department of Education, Training and Youth Affairs, was offered for the first time. It assesses four generic skills – critical thinking, problem-solving, interpersonal understandings and written communication. Initially, the initiative received a mixed reception from the higher education sector. There were some concerns that it would lead to the narrowing of the curriculum as a result of universities focusing on what was required for the test. Others held the view that given the generic nature of the skills being tested it was more likely that courses would be deepened and broadened as a result of a focus on such outcomes (Gallagher 2000).

Changes in curricula over the decade seem to have been somewhat patchy and in many instances reflected the type of changes that universities have always made as they responded to new developments and changing needs and interests. Some courses changed little. In other cases, components of old courses were expanded into new courses to accommodate an increase in knowledge or interest in particular areas²⁷. Some disciplines added new material or new specialisations often by simply adding specialist units towards the end of a course²⁸.

Overall, however, curricula evolved considerably during the 1990s. There were a significant number of courses developed in new areas of knowledge, especially where information and communications technology developments extended what was possible. Many of these were multidisciplinary courses that crossed traditional boundaries. Some courses were completely overhauled and reoriented with new content based on new approaches to learning and teaching such as medicine at The University of Sydney (see Box 2.9). The embedding of graduate attributes in the curriculum required a paradigm shift in the way curriculum was designed, developed and implemented in universities and exposure to, and reflection on, a variety of teaching approaches and learning experiences that could be used to develop such attributes (Bowden et al. 2000).

2.3 Improving teaching, learning and assessment

In the Australian university of a quarter of a century ago the typical class was small, the academic staff had been built up gradually, the lecturers were teaching familiar courses, and had the time to give careful attention to the work submitted by students. In the intervening years, rising numbers have made teaching more impersonal, and lecture rooms and their equipment have not been adapted to ensure that every student in a class of several hundred can both see and hear the teacher. Correction and supervision of student work is generally the responsibility of the young graduate who is sometimes more interested in completing his higher degree than in helping the struggling fresher. ... insufficient attention is being given to the possibility of less formal lecturing, more and improved tutorials, and independent study programmes which may include some vacation study.

²⁷ For example, students in 2001 could undertake study for a bachelor degree in business administration, a degree course that was unavailable in 1991 although students could specialise in this area as part of a bachelor of business course.

²⁸ For example, the Bachelor of Science (marine, freshwater Antarctic biology) course offered at the University of Tasmania largely comprises general science units for the first two years – it is not until third year that students undertake units in the area of speciality such as aquatic botany, Antarctic ecology, marine ecology and freshwater ecology (University of Tasmania 2001b).

The present situation poses a challenge to universities to take active steps to consider the nature and improve the quality of their teaching. University staff have an obligation to regard teaching as their major responsibility.
(Martin 1965, vol. 1 p. 55)

Clearly, the quality of teaching was not a concern specific to the 1990s. However, the importance of good teaching was explicitly recognised in the 1991 Commonwealth policy statement, Higher Education: Quality and Diversity in the 1990s (Baldwin 1991) which proposed the establishment of an independent national centre for teaching excellence. After consultation with the sector it was decided that a ministerially appointed committee would be a more effective way of encouraging good practice and innovation. Consequently, in 1992, the Committee for the Advancement of University Teaching was established under the National Priority (Reserve) Fund³⁰ with the mission to help raise the status of university teaching and to contribute to better quality of teaching and learning in Australian universities. According to the Chairman, the committee was a change agent with:

the daunting task of helping to shift the culture of universities, which in the past few decades have become dominated by their research function, so that teaching is restored to its central position as the most important thing university academics do.
(Anderson 1994, p. iii)

The 1991 policy statement also gave rise to the quality rounds conducted by the Committee for Quality Assurance in Higher Education, mentioned previously. One of the elements of the quality rounds was a focus on teaching and they helped to stimulate the quality management of teaching in many universities.

The Committee for the Advancement of University Teaching funded national teaching development grants to encourage innovations in university teaching. Because the individual funding provided was modest the Committee was able to fund many small projects³¹. Some examples of projects funded in 1995 are given below.

- contextualising health and physical education teaching and learning models
- mastering academic English: the language of economics and accounting
- teaching the discourse of academic disciplines to higher degree students
- conceptual design aids for structures teaching in the architectural design studios
- an integrated teaching and learning program for first year macroeconomics
- diagnostic tools for improving concept development
- application of explanation-based learning to the teaching of biochemical calculations
- improving student approaches to learning in a first year engineering course
- a problem-based learning package in paediatric dentistry utilising interactive media
- multimedia-based tutoring system for mechanics concepts in science and engineering
- computer aided visualisation and interactive interpretation of geological history

The projects tended to focus on particular areas of teaching and learning in particular institutions. However, the Committee recognised that the value of educational experiment and innovation funded through its grants and other programs depended on the extent to which their results could be disseminated and possibly adopted by others. Consequently, in 1995 it established UniServe – a network of clearing houses in five broad discipline areas (law, engineering, health, physical science, and humanities and social sciences) to publish, evaluate and provide access to higher education materials, reviews and ideas, which otherwise might be little known beyond the university department in which they originated (Anderson 1995).

The Committee realised that the rewards academics received for their contributions to good teaching were critical to improving teaching in universities and commissioned a study into how good teaching in universities could best be recognised and rewarded (Ramsden et al 1995). In

addition, the Committee recognised that the massification of higher education required new understandings and services to assist students to make the transition to university. It was assumed that the large increase in the proportion of the population studying at university in the early 1990s meant that the student population was far more diverse. In reality this diversity was not as great as many believed, but nonetheless there were concerns about the ability of traditional academic teaching practices to cope with such diversity. This belief is echoed by the following comment:

Students can no longer be assumed to be sufficiently gifted to learn for themselves in the face of indifferent teaching. Nor can individual or group differences within the student population be ignored.
(Coaldrake and Stedman 1999, p. 3)

As first year students exhibited the greatest diversity (McInnis 1995) the Committee commissioned a study on the first year experience. It also investigated assessment and examination processes in universities and in 1994 established the National Teaching Fellowships to recognise exceptional achievement and enterprise in teaching and learning, particularly innovative practices which would make learning rewarding and enriching for students. One of the outcomes of the work of the Committee was that more universities established central and faculty structures with a focus on teaching and learning (some had previously set up committees for research, but not teaching); several universities developed their own grant programs and the impact of innovative projects on teaching and learning tended to spill over into other subjects or courses (Anderson 1995).

Not surprisingly, given the rapid development being made in information and communications technology, many of the projects involved the application of computer or multimedia to the learning situation. Table 2.10 gives topic categories of successful grant applications in 1996.

Table 2.10 Grant topics 1996

Topic	% of grants
Information technology based	79
Small group teaching	6
Practical work	4
Distance education	4
Transition to university	2
Assessment	2
Student centred learning	1
Remedial courses	1
Large group teaching	1

Source: Anderson 1996 p.11

The university community itself recognised the importance of teaching and learning. In 1994 the Australian Vice-Chancellors' Committee developed generic guidelines on *Universities and their students, expectations and responsibilities*, which it revised in 1999. The guidelines state that:

The university will endeavour to provide a suitable environment for teaching and learning and research supervision in which students will be stimulated to reach a high level of intellectual attainment. This learning environment should take account of the different characteristics of students and their varying cultural and educational backgrounds including those of Indigenous Australian students. The teaching-learning environment should be a positive and co-operative one where students will have reasonable access to staff to discuss issues and problems and can expect fair, critical and helpful assessment and feedback on their academic work in a timely manner.
(Australian Vice-Chancellors' Committee 1999)

An independent review (Moses and Johnston 1995) of the work of the Committee recommended that funding be increased and that the National Teaching Development Grants program be redefined to broaden the scope of the projects to be funded and to place a greater emphasis on achieving systemic change. After the change of government in 1996, the National Priority (Reserve) Fund was replaced by the Higher Education Innovations Programme. It funded a new committee in 1997 — the Committee for University Teaching and Staff Development. The staff development aspect of the new Committee's work was a legacy from another committee, the Commonwealth Staff Development Fund established in 1990. It existed in tandem with the Committee for the Advancement of University Teaching and was also reviewed at the same time.

The Committee for University Teaching and Staff Development funded organisational as well as individual national teaching development grants to encourage educational innovation and effective practice through the development of processes and practices within organisational units or disciplines at universities (Moses 1998). A number of projects involving collaboration between universities were funded in this way. The National Teaching Fellowships were broadened to attract, in addition to practising hands-on university teachers, senior academics with recognised scholarship and demonstrated strong leadership in teaching and learning. The Committee also awarded Staff Development Grants. One of the objectives of these grants was to enable staff:

to take up with confidence the challenges of a changing external environment of universities, the changes in the staff and student body, and the changes in organization and delivery of teaching and research.
(Moses 1998, p. 4).

In 1997 the Commonwealth Government initiated the Australian Awards for University Teaching as a way of recognising the contributions of outstanding academics to good teaching.

In 2000, the Australian Universities Teaching Committee was established to continue the work of the Committee for University Teaching and Staff Development. One way to make effective use of limited funds available to the Committee was to fund fewer but more strategic projects. Therefore, instead of focusing on grants to individuals and institutions, the new Committee adopted a strategy based on providing support for large-scale, cross-institutional projects aimed at producing a significant enhancement of teaching and learning outcomes in major disciplines or professional fields. This approach recognised the importance of graduate outcomes and acknowledged the need for universities to take into account the perceptions and needs of employers and professional associations in curriculum design and delivery.

In 1997, only four per cent of development grants funded by the Committee for University Teaching and Staff Development were reported as formally collaborative projects. In 1998 this figure had reached 8% and by 1999 it had risen to 32%. In 2000, two-thirds (66%) of grants administered by the Australian Universities Teaching Committee were for collaborative projects. In addition to this increase in the number of collaborative grants, analysis shows an increase in the number of institutions collaborating on various projects. While early collaborative efforts tended to involve two or three partners per project, several 1999 and 2000 projects involve participants from eight or more partner institutions. Such large-scale collaboration assists the dissemination and ownership of ideas and practice in teaching and learning generated by projects.

Professionalisation of teaching

As autonomous institutions, Australian universities pursued various approaches to academic teaching to suit their own particular philosophy and requirements. Within individual universities there could be considerable variation in the quality of teaching output. These differences were

mitigated by a wide range of mechanisms at the institutional level such as: academic board oversight, course reviews, student feedback, peer evaluation, external examination of higher degrees, national and international benchmarking of course delivery standards and various initiatives to encourage excellence in teaching.

There was a growing realisation in the 1990s, partly as a result of the work of the various committees previously mentioned, that academics might require some training in order to become good university teachers. Monash University, for example, developed a teaching and learning support plan in the early 1990s which proposed:

- a mandatory induction program for all new academic staff;
- a mentoring scheme for all new academic staff members with little or no experience of university teaching and supervision;
- a professional development program for academic staff and the appointment of Associate Deans (Teaching) to take responsibility for the enhancement of teaching and learning in their faculties;
- encouragement of proposals for outside studies programs which have an emphasis on course development and teaching improvement and innovation;
- continuing the Vice-Chancellor's Awards for Distinguished Teaching and introducing a similar award for supervision;
- modifications of the regulations and procedures relating to promotion and selection to strengthen the importance of teaching;
- support for funds for innovative projects designed to enhance teaching effectiveness;
- extension of the teaching improvement projects scheme; and
- the incorporation of a teaching quantum in the allocation of funds to facilities.

(Monash University 2001a, p. 1)

A number of universities appointed deans, pro vice-chancellors and deputy vice-chancellors to promote teaching and learning.

A major challenge for universities was how best to encourage academic staff to invest more in developing their teaching capabilities. Some linked teaching criteria to selection for promotion or funding. For example, the University of Sydney put in place a comprehensive system to reward and encourage good teaching practice through the allocation of funds (Box 2.8).

Box 2.8 Recognising teaching in a research-intensive environment

Paul Ramsden Pro Vice-Chancellor (Teaching and Learning), University of Sydney

The University of Sydney has introduced a series of initiatives designed to recognise and reward the practice of research-led, evidence-based teaching. They aim to:

- align fundamental scholarly values with a commitment to enhancing the quality of the student experience
- combine a collegial approach to quality assurance with strategic management of resources
- apply international best practice for improving learning and teaching in research-intensive environments

Linking resources and good teaching

A key management strategy has been to link resources to the quality of teaching and learning. Beginning in 2001, a component of faculty funding has been allocated as performance and improvement funds. There are three parts to these funds.

The Teaching Dividend consists of marginal funding allocated through a formula based on performance indicator results.

The performance indicators reflect national and international criteria appropriate to research-intensive universities as well as University of Sydney priorities for enhancing the student experience in a scholarly environment. They are referenced to Group of Eight averages where possible. They include first year undergraduate retention, student progress, student and graduate satisfaction, and graduate destinations.

In 2002, the funds allocated through this process will amount to over \$3.2m. The weighting of the formula provides a substantial incentive to make evidence-based changes to curricula and assessment in order to enhance the quality of student learning outcomes. This particular formula-driven approach to performance funding for teaching is thought to be unique in Australia.

The Scholarship Index aims to give direct recognition and reward to departments, schools, teams and individual academic staff who contribute to leadership and scholarly outcomes in learning and teaching.

The index is modelled on similar formula-driven performance based research funding. In 2001 it deployed approximately \$650,000 from faculty budgets to reward staff who are qualified in university teaching, who are successful in university and national teaching awards, and who contribute to the scholarship of teaching through publication of refereed journal articles in university learning and teaching. The impact of these marginal funds on behaviour and attitudes to the University's commitment to recognise good teaching has been substantial. Again, the scheme is believed to be the first of its kind in an Australian university.

The Teaching Improvement Fund for 2002 amounts to about \$1.5m. These contestable funds are distributed through the College funding model mainly to large projects that are designed to transform the student experience through evidence-based curriculum change. Projects which succeed in gaining funding directly address targets and objectives in faculties' teaching and learning plans and are consistent with University priorities enunciated in the Strategic Plan. In 2001 they included redesign of the undergraduate Engineering curriculum, development of faculty-wide first year units of study in Health Sciences, and a new foundation program in Law.

Alignment of scholarly values with a research-led approach to improving teaching and learning is emphasised by connecting these resource allocation processes to strategies managed by the Academic Board and the Office of the Pro-Vice-Chancellor (Teaching and Learning). These include an approach to quality assurance that draws on best international practice in research-intensive universities and the production of annual teaching and learning plans.

Collegial approach to quality assurance

The University's approach to quality assurance and improvement is academic-led – driven by people who are active in teaching and research, rather than being conducted as a separate activity by an independent office. As part of this approach, faculties now provide the Academic Board with an annual self-evaluation of their academic quality assurance systems. The self-evaluation report addresses aspects of the management of quality in teaching and learning, including systems in place for ensuring the integration of research with undergraduate teaching, processes for assuring the quality of student assessment and standards, quality assurance for research training, and methods for monitoring student progress and recognising good teaching.

The self-evaluation report is the precursor to faculty visits initiated by the board. The review panel includes the Chair of the Academic Board, faculty representatives, and the Pro-Vice-Chancellors for Teaching and Learning and for Research. Visits are conducted annually and comprise a series of structured interviews between the review panel and groups of students, staff and the senior officers of the faculty. These reviews are formative and collegial. Their purpose is to disseminate good practice and offer support for improvement.

Teaching and learning plans

Since 2000, faculties have provided Teaching and Learning Plans, including an operational component that admits evaluation of progress against targets. Plans are structured around the University's research-led teaching objectives. Production of satisfactory plans each year, including reporting against targets, is a condition for receiving performance and improvement funds. Progress towards goals in the plans, and assistance with achieving them, are among the topics discussed at the annual Academic Board review visits.

Benchmarking quality and outcomes with international partners

The University of Sydney has established partnerships with leading international universities aimed at sharing good practice in the management and improvement of teaching and learning in research-intensive environments. These partnerships cover issues related to internal quality assurance, recognition of scholarship in teaching, strategic responses to external quality assurance systems, and applications of information and communications technology. The agreements include a memorandum of understanding with the University of Oxford that has recently led to an agreement to conduct surveys of student experiences based on the University of Sydney's annual student course experience questionnaire. The instrument is derived from fundamental research into the impact of student experiences on the quality of learning outcomes. The two universities look forward to comparing the experiences of their students and to learning from each other about how to improve them.

There were some moves towards the professionalisation of teaching in universities in the 1990s. A number of universities instituted formal preparation programs for new teaching staff and others offered non-credit seminars for enhancing teaching or graduate certificate programs in higher education, however, anecdotal evidence suggests that the take-up of such programs was not high. With this in mind, in 2001 the Commonwealth commissioned a research project to examine the state of teacher preparation and in-service development in Australian universities and the attitudes of the sector to a systematised attempt to assure quality in university teaching through a nationally recognised validation process (Dearn et al. 2001).

There was also a growing body of literature that focused on teaching and learning in higher education. In 1990 Boyer published *Scholarship Reconsidered: priorities of the professoriate*, which placed the scholarship of teaching on par with the scholarship of discovery, integration, and application. In 1992 Ramsden published *Learning to Teach in Higher Education*, which has become a seminal work on teaching and learning both nationally and internationally. In 1993, the Australian Vice-Chancellors' Committee released *Guidelines for effective university teaching*, and the Higher Education Research Development Society for Australasia produced a document, *Challenging concepts of teaching: Some prompts for good practice*. This focus on pedagogy helped universities to reflect on the nature of teaching and learning in higher education:

Developments in pedagogy challenged the orthodox approach to university teaching. There is ample evidence in the literature to suggest that the most valuable learning experiences are not restricted to the traditional lecture-tutorial-format.
(University of Queensland 1997, p. 6)

Changes in pedagogy

As noted at the outset of the chapter, one of the major changes in teaching and learning in universities over the past decade was the adoption of a more student-centred approach to learning. According to Poole:

...student-centred learning is about how the system can deliver to students or clients or customers the sorts of packages, programmes and employment pathways that they really want.
(Poole 2000, p. 76)

The approach required a pedagogical shift in the way universities viewed teaching and learning based as it was on the concept that students were active participants in the learning process and therefore should be able to shape it to meet their needs.

Good learning practice requires that the student should be an active participant in the process, not merely an empty vessel to be filled with facts supplied by the teacher. As active learners, students need to be encouraged to take responsibility for their own progress. Good learning requires "feedback" and good teaching method needs to ensure that students are aware of their progress at all stages. Furthermore effective learning is usefully seen as a social activity as well as an individual, cognitive one, involving as it does interactions with teachers and with other students.

(Anderson 1995, p. iv)

It was also related to the concept of flexible learning – that the learning environment should be flexible in order to accommodate differences in student learning needs, styles and circumstances. In other words one size does not fit all. It also meant recognising the limitations of the traditional way of delivering higher education. Flexible delivery can be defined as:

the provision of learning and assessment opportunities in a way that does not require the student to be present at a particular place or at set times. The materials may be presented in a variety of modes, increasing the degree of student control over when, where and how and at what pace they learn.

(University of Queensland 1997, Section 5)

Universities in the 1990s started to introduce some degree of flexible delivery into their courses, sometimes with far-reaching implications for the way a university went about its business. For example, for one university (Monash University 2001b) it meant emphasising the importance of students' active participation in learning by:

- building on previous learning in developing new skills and understandings;
- fostering the desire and skills to continue learning; and
- encouraging students to take responsibility for self-directed learning;
- as well as increasing learners' choices by increasing choice of:
- methods and timing of interaction with teachers and other students;
- place and time of learning;
- course modules and pathways through higher education;
- entry and exit conditions; and
- access to administrative and student learning support.

Universities also realised that student-centred programs offering flexible learning and delivery, not only had a strong pedagogical basis, but were also likely to be attractive to many students – an important consideration in a strongly competitive environment (The University of Queensland 1997, Murdoch University 2001, University of New England 2001). For example, Curtin University of Technology recognised not only the educational value of this approach but also that students might actively seek a university that offered such an approach:

to equip students for lifelong learning and for making a positive contribution to society, Curtin's programs must satisfy their diverse needs. Among other things this will mean shifting the normal emphasis from teacher-dominated instruction to self-directed and distributed learning. The move away from a transmission model towards one that focuses in a more responsive way on the learner is intrinsically desirable for educational reasons, since research shows that people learn best when they have some control over practical elements in the process of acquiring knowledge. It is also a strategic imperative in the context of an intensely competitive higher education, since potential students will look elsewhere if we do not provide a learner-centred environment.

(Reid 1999, p. 1)

Some universities embraced these educational developments across the board. For example, the University of South Australia progressively developed, adopted and refined, from 1993 onward, a teaching and learning framework based on the concepts of student-centred learning, graduate qualities or attributes, and flexible delivery (University of South Australia 2001). The University established a flexible learning centre in 1995 and sought to establish a learning environment in which:

- access to learning opportunities and control over learning processes were increased;
- opportunities to practise the skills and attitudes which underpin the graduate qualities were provided; and
- choice, reflection and the possibility of exercising personal responsibility over one's own learning were invited and encouraged.

In other universities, the degree to which alternatives to traditional face-to-face teaching were implemented varied between courses or departments, depending on the enthusiasm and expertise of staff, the nature of the material being taught, familiarity with alternatives and the availability of resources. Student-centred approaches were not always easy to implement in other than a piecemeal manner as logistical issues could present considerable hurdles to large-scale change. New approaches to teaching and learning could require additional staff and equipment and a greater time investment than traditional teaching techniques, especially in the developmental stage.

Large class sizes were seen as a barrier to the implementation of the new teaching practices that seemed to require smaller staff/student ratios, however, it was also pointed out that a flexible delivery approach could actually assist universities to meet the challenge of large classes:

In subjects with very large enrolments the value of lectures as a mode of information transmission is greatly diminished by the size of the class and the impersonal nature of the lecture environment. It takes an unusually gifted lecturer to rise above these constraints. While lectures in these circumstances may be a cheap form of teaching they are usually an ineffective form of learning. The Working Party suggests that such subjects would benefit from offering the information content through flexible delivery, with staff contact being redirected to other modes. Since many of these subjects are first level, often with large numbers of school leavers, it is important that the socialising effects of staff-student and student-student contact are not lost.

It is therefore suggested that flexible delivery be exploited to devote more staff resources to student contact.

In general, the greater the student numbers the more impersonal the lectures, and the stronger the argument to use flexible delivery in the way suggested. It is also the case that greater numbers can provide greater economies of scale for flexible delivery.
(University of Queensland 1997, section 8)

A project on teaching large classes was conducted by The University of Queensland in 2002 for the Australian Universities Teaching Committee (Illing 2002)²⁹. It found that it is not the size of the class that matters so much in achieving effective learning outcomes but rather the resources available to support teaching and the way a program is structured and taught.

Because flexible delivery of curriculum material could involve a number of people in the development, packaging and delivery of course material as well as collaboration with other

²⁹ The report is available at <http://www.autc.gov.au/pr/sessional/tlc.pdf>

institutions, the ownership of intellectual property needed to be addressed, especially if there was some potential for the university to commercialise the material:

What are the legitimate claims of the University and of individual staff to ownership of the intellectual property resident in material developed for flexible delivery? How can the University ensure continued use of the material if the staff member(s) who developed it leave the University? Do staff leaving the University have the right to use the material in their new place of employment? If so, under what restrictions (e.g. on further development or commercialisation)? Should individual staff benefit from commercial exploitation of material?

(University of Queensland 1997, p. 13)

The growth of international consortia, such as Universitas 21, involving the collaboration of a large number of universities, raised concerns about academic freedom, control over the curriculum as well as intellectual property, because copyright over teaching modules and the right to amend, reproduce and package course materials could reside in the Internet provider rather than the individual academic or even member university providing the material (*Campus Review 2000*).

Sustaining changes in approaches to teaching and learning could be difficult. Change was often initiated through the efforts of a few committed and knowledgeable individuals. Only a tiny fraction of academics were involved in the projects funded by the Committee for the Advancement of University Teaching and the Committee for University Teaching and Staff Development in the 1990s and therefore, the number of staff at the leading edge of educational developments was likely to be small. Change could easily lose its impetus if particular individuals left a university.

Despite these issues, it seems that overall, students were being exposed to a greater variety of modes of teaching during their degree courses than before, although, in Australia, large numbers of students had always participated in higher education through distance education. There appeared to be greater flexibility in the way award and non-award courses for the professions were delivered, particularly at postgraduate level; greater collaboration on the development of learning materials; and greater development of learning materials for multiple uses.

Problem-based learning

Problem-based learning is an example of a student-centred approach to learning that was increasingly adopted by Australian universities (as well as universities in Europe, Canada and the United States) over several decades (Aldred et al. 1997). Typically, in this approach a relevant problem is presented to students, without prior preparation, to trigger their curiosity and engage their interest. In small, mutually supportive groups of between six and ten, students rehearse their ideas, hypothesising widely to explain possible underlying mechanisms, and after critical discussion, reach a conclusion. Each problem extends for a week or longer, and groups meet typically two or three times. Between meetings students direct their independent study to resolve the problem and to meet their own individual learning needs. Some more formal classes and other resources may be provided to support that learning but unstructured time is protected in order to provide adequate opportunities for self-directed learning (see Box 2.9).

Box 2.9 Problem Based Learning at the University of Sydney

Ann Jervie Sefton, Faculty of Medicine, University of Sydney

In 1991, the Faculty of Medicine at the University of Sydney undertook to spend a year to consider a major change in the then six-year, didactic undergraduate medical program. Over 120 staff and students volunteered to join working groups that considered goals, curriculum

design, admissions, assessment, and a related issue, that of the development of a clinical school model for the teaching hospitals. Debate was lively, and sometimes vigorous.

Late in 1992, an overwhelming majority agreed to significant change, based on new goals clustered into four themes: Basic and Clinical Sciences; Community and Doctor; Patient and Doctor; Personal and Professional Development. Design was to be goal-directed, problem-based learning was seen to represent current best practice, and the need for ongoing, responsive curriculum evaluation was acknowledged. Graduates would be selected, using rigorous new procedures. Principles were enunciated to ensure that both formative and summative assessments matched the goals and philosophy of the new curriculum. Each student would attend a clinical school from the beginning for one day each week in order to develop clinical and communication skills relevant to the weekly problem. The Dean (then Professor J.A. Young) was strongly supportive throughout.

Health data were scanned to determine clinical problems that were common in Australia, treatable, preventable or otherwise important, and other curricula were reviewed for the balance of discipline-based content. An earlier review of the former didactic curriculum had been undertaken by interdisciplinary groups drawn from across the Faculty. These groups were reconstituted and suggested appropriate core cases that included key content issues and demographic data; these were mapped into a database. Simultaneously, and with some overlap of membership, four theme-based groups formed to develop progressive vertical views of the curriculum.

An academic team of three maintained an overview of the developing curriculum. Seventy problems identified for the first two years were grouped into nine blocks of related content. In accordance with an agreed general framework, each problem was developed by a case coordinator who consulted widely. Strict limits on face-to-face formal teaching were imposed. For each weekly problem the review group, along with additional experts, systematically identified the core learning issues. Each would be presented through the following vehicles; a web-based 'trigger'; up to eight one page summaries for individual study (learning topic); up to six lectures to introduce difficult concepts; practical classes to offer hands-on experience; theme seminars to provide larger-group interactions. Extensive review of the content and strategies across the Faculty (by discipline, theme, special interest) resulted in significant refinements as staff identified gaps or redundancies and suggested rearrangements.

It was agreed very early to use the intranet to support the learning although the technology was then new. An educational designer and programmers were used to ensure that the system was intuitive to use. Each weekly problem is introduced with a photograph and brief description; further information is successively revealed for later tutorials and private study. Students have access to previous, but not future, problems. The system is invaluable. It is flexible, providing access to learning topics, lecture and session outlines, resources such as images, library readings, access to recommended websites as well as clinical or public health data. Teachers review materials, enhancing the quality of the program and its resources. Students access online self-test questions relevant to the weekly problems, allowing them to review their progress – and they do so avidly. New resources are added while existing materials are reviewed and enhanced regularly. A close relationship with the medical librarians, represented on many of the key committees, has been crucial.

Staff and students have access to email and management information – timetables, bulletins, contact details. Extensive web-based processes for evaluation of the curriculum provide ongoing information on aspects of the effectiveness of the curriculum. An innovative clinical reasoning guide for students in years 3 and 4 carries problem-based learning into the senior years; other resources continue to grow. One additional aspect of the information technology has been the parallel development of evidence-based medicine through the four years. From the beginning, students are introduced to the philosophy and the skills of appraising the

literature critically in order to make informed clinical decisions. The intranet supports students' access to the relevant resources.

Community groups as well as professional and educational organisations were consulted as the goals were developed and refined. The process of developing the problems was open, with many staff contributing. Enhanced collegiality in the Faculty is now apparent, and alliances forged during the educational development have led to new collaborative research. The problem-based learning was embraced enthusiastically by students, who are performing exceptionally well in the new collaborative environment.

During the early discussions, it became apparent that two other medical schools (Flinders and Queensland) were independently confronting similar issues and solutions. A consortium was formed to pool experiences, share knowledge and transfer skills. It has been a valuable collaboration, strengthening the quality of all the curricula and selection methods as well as ensuring a wise use of resources.

The early introduction to clinical work aligned with the weekly problems has been universally acclaimed by students and staff, although it puts significant strains on clinical schools. The personal and professional development theme has been positively received, although novel in Sydney. Students submit portfolios and are interviewed by a member of staff, a process that is providing considerable insights for both groups. Issues of community health are also discussed in a relevant context. Another lesson learned is that resources for planning are crucial, in order to free staff from demanding teaching and clinical duties. In Sydney, funding was largely won from external sources. The support of senior management is essential. The appointment of medical educators was vitally important, to enhance existing strengths. They contribute not only to design and development of the curriculum and assessment, but also to staff development, as well as providing an up-to-date perspective on educational theory and practice.

As the first cohort completed in 2000, student evaluations have been transformed, from almost universal criticism of the former program to now strongly positive responses.

Problem-based learning had been used at the University of Newcastle medical school since its inception over 20 years ago. By the end of the 1990s, all recently established graduate-entry medical schools (Flinders, Queensland, Sydney) and Melbourne (with a combined graduate/undergraduate entry) and the only graduate dental school (Sydney) adopted the process as a core strategy. Several undergraduate medical and dental programs also use the approach, sometimes as a smaller component within a single discipline.

At some universities, teachers of medical sciences successfully adapted the method for undergraduates within faculties of science. Some faculties of health sciences, including pharmacy, also adopted modifications of the medical model. In nursing, a related approach was developed, often referred to as inquiry-based learning, as the end-points of the discussions tended to be less clear-cut than the diagnostic decision that resulted from problem-based learning in medical schools. Adaptations were introduced into social work (where the approach is referred to as issues-based learning) and law and education, drawing together issues of professional practice with theory and social context.

The 1990s saw the development of some innovative approaches to teaching in universities that had the potential to radically change the role of both academics and students. However, it was not just the learning experience that determined what students learnt and how they learnt, assessment was also a powerful influence.

Assessment literally defines the curriculum for most students – by spelling out the learning that will be rewarded it is a potent strategic device for educators.

(James and McInnis 2001, p. 4)

Assessment could be a two-edged sword: it could either limit or broaden the scope of teaching; either foster innovation or stifle it. Greater attention was paid during the decade to assessment and its multiple roles in the university setting.

Assessment

As well as shaping students' approach to their studies, assessment can be used to provide feedback on their progress, determine whether they are ready to proceed to the next level, judge their fitness to practise a profession, and protect and guarantee academic standards. However, it has been the summative aspect of assessment that has tended to dominate over the past decade or so. Evidence suggests that only a minority of academics use assessment in its diagnostic capacity, as a formative or developmental tool, although many believe that it should be used in that way. Studies indicate that the most frequently assessed aspect of learning was students' depth of knowledge, followed by their ability to think critically and their written communication skills and problem solving abilities (James and McInnis 2001).

In 1993, the Committee for the Advancement of University Teaching funded a project to develop a series of user-friendly materials to be of practical assistance to university teachers in assessing and examining students across a range of subjects. The project aimed to help academics break free of the traditional methods of assessment in their disciplines to combat the frequent use of superficial assessment tools that encouraged rote learning and learning of information out of context simply in order to pass exams. The project produced some useful strategies for dealing with issues associated with less familiar assessment techniques such as the use of self-evaluation and portfolios and the assessment of group work. These techniques appeared to become more common as the decade proceeded. Indeed, the project found that by the mid 1990s assessment in universities was changing. There was a growing desire to assess a broader range of student abilities; to harness assessment as a tool for supporting learning; and to nurture students' ability to evaluate their own performance (Nightingale et al. 1996).

Universities in the 1990s started to emphasise the importance of the two aspects of assessment (Box 2.10). For example, Monash University recognised the importance of both the summative and formative functions of its assessment regimes and the need to make a clear distinction between them in its Education Policy first developed in 1994. The University was concerned that the need to grade students did not conflict with the important educative role that assessment could perform in both 'presaging to students the kinds of intellectual engagement desired and in providing feedback as to their performance' (Monash University 2001a). It stipulated that students should receive feedback on their work in time for them to benefit in preparing for the next task and it should be constructive, focused on assisting them to understand how they can improve the quality of their work.

Box 2.10 Assessment at the University of Wollongong

Purposes of Assessment

Assessment is an essential part of the teaching and learning process. Properly selected assessment tasks signal the importance of developing the attributes of a Wollongong graduate through particular content, concepts and skills. They influence approaches to study and help students to allocate their time appropriately. Constructive and timely feedback on assessment helps students to gain a sense of achievement and progress, an appreciation of the performance and standards expected in a particular discipline or professional area, and to learn from their endeavours.

Staff need to consider the functions of each component of assessment, selecting methods and practices which ensure that these can be achieved. Information about these functions should be communicated to students. The functions are:

- to judge performance, by awarding marks which indicate whether and how well a particular student has attained the stated learning outcomes, and
- to determine whether a particular student is sufficiently well-prepared in a subject area to proceed to the next level of instruction;
- to provide feedback to students which indicates levels of attainment, and to indicate and diagnose misunderstandings and learning difficulties,
- to provide feedback to teaching staff to indicate areas in which students are experiencing difficulties, and to identify and diagnose ineffective teaching; and
- to promote learning.

Good Practice in Assessment

- Assessment should promote learning and improve student performance.
- Assessment should be in a form which allows the determination of how well each student has achieved measured against the stated student outcomes of that subject and provides appropriate feedback.
- Weightings for each assessment component, and deadlines for submission of material for assessment should take into consideration the stated student outcomes of the subject and the required function of the assessment.
- Feedback on performance be provided to students before mid-session, in time for withdrawal without penalty, and to improve performance before further assessment; undue delay in providing feedback is unacceptable practice.
- Material submitted for assessment which is also intended to inform students and/or which is relevant to the final examination for the subject, should be marked and returned before the study week before the formal examinations.
- Assessment should be based on more than one piece of work and should require demonstration of achievement in a range of outcomes.
- As part of the assessment in every subject, students should produce some written work and at least one piece of individual work from which the unaided capability of each student can be assessed.
- No component of assessment should count for more than 70% of final mark, except in subjects designated research project.
- Assessment methods should provide reasonable accommodation for students with disability.
- Students may ask for a review of any piece of assessable work. Such review may involve a re-mark of the piece of work.
- Group work may not constitute more than 50% of assessment.

(University of Wollongong 2001, sections 2.1-2.2)

Despite such awareness of the importance of formative assessment there is some evidence of a decline over the second half of the decade in the extent to which students believed that academics provided them with feedback. Academics also believed that there were serious discrepancies between what they actually assessed and what they believed they should assess (James and McInnis 2001). This trend is evident in graduates' responses to the Course Experience Questionnaire discussed in the next section.

The integration of generic attributes such as teamwork, communication skills and critical thinking, into the desired outcomes of courses meant that universities had to come to grips with assessing the capabilities of students in such areas. Increasingly, students were required to make oral presentations as part of their assessment in recognition of the importance of a range of communication skills. They were also increasingly required to participate in group learning activities; however, many academics were cautious about setting group assessment especially if they had little or no experience of problem-based learning environments such as those adopted in many medical faculties. Typically, staff were concerned with being fair to individuals within a group and assessing group processes as opposed to group outcomes (James and McInnis 2001).

Towards the end of the decade there were growing concerns about some aspects of assessment in universities. There were concerns about plagiarism; assessment of group activities and increasing numbers of international students unfamiliar with Australian assessment procedures. The main public concern centred on whether academic standards were being eroded. The Australian Universities Teaching Committee funded the Assessing Student Learning project in 2001 to investigate these issues and to produce a set of resources to assist universities in using assessment to improve teaching and learning (Australian Universities Teaching Committee 2001).

While there is no evidence to suggest that standards in Australian universities have fallen it is difficult to determine this as little is known about relative standards in Australia, especially as external assessment is rare in undergraduate education. Whether it is possible to have a set of relative standards across Australian universities is likely to be highly debatable. There would be many issues to resolve, such as whether standards in universities should be norm or criterion referenced. Also, it seems that Australian universities have always applied different standards to different groups of students where it has been appropriate to do so. For example, a university may have accepted a different standard of work from students studying physics to become engineers than those studying physics as a core unit in a medical degree (Ewan 2001). The development of standards would need to be undertaken in close consultation with the university sector.

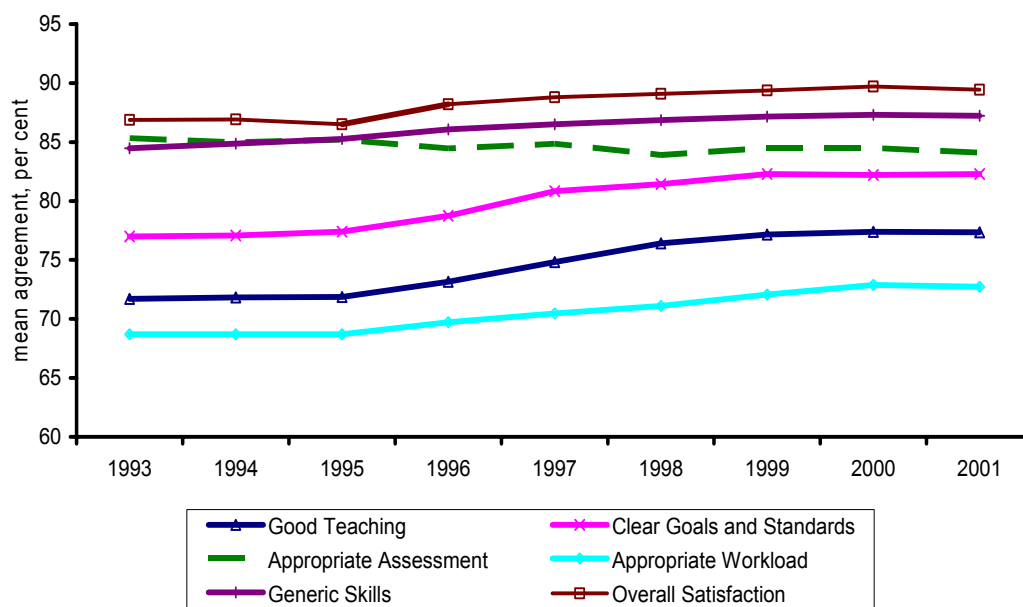
In the United States of America, it is not expected that all university courses will be of a similar standard given the large numbers of universities, the diverse student population and great variety of subjects and purposes of courses. Instead graduates can sit an examination at the end of their degree courses which can be used by potential employers to gauge their capabilities. The Graduate Skills Assessment referred to earlier can be used to provide useful information to employers on the extent to which Australian students possess some of the generic qualities that they expect of graduates. In fact, many Australian businesses have requested its use. The test is not compulsory and relatively few students have participated in it to date; however, this may change if the incidence of plagiarism and concerns about standards lead employers to require additional proof of ability.

While there apparently has been little systematic research in Australia to determine whether the use of web-based information has led to an increase in student plagiarism, anecdotal evidence suggests that plagiarism has risen dramatically (Australian Universities Teaching Committee 2001). Some have suggested that an increase in cheating may be the result of greater demands placed on students especially as a result of changes in their study/work patterns; a waning commitment to a culture of academic honesty and rigour; as well as the opportunities for cheating provided by the use of the Internet. Some universities have developed detailed policies on cheating and installed detection software to identify plagiarised material and some have tried to reinforce the importance of the integrity of the academic process.

Despite concerns about plagiarism, online assessment is valuable because it can efficiently provide formative assessment, while at the same time, if automated, reduce staff workloads. An interactive assessment task can be used as a learning experience for students and timely feedback can be provided online. As well as submitting assignments electronically it is also possible for students to complete examinations online. At Curtin University, self-administered student assessment using information technology, has become a major component in many programs with over 30,000 student tests conducted in 1998 (Reid 1999). Fully online assessment raises questions about the degree to which: assessment items test the full range and complexity of learning outcomes; equity for all students is ensured; and individual student performance can be verified (James and McInnis 2001). A rapidly growing number of courses are fully online with many units featuring totally online assessment, as universities commit to developing information and communications technology infrastructure and teaching materials.

It is interesting to note that Course Experience Questionnaire data indicate that undergraduate broad satisfaction with assessment practices at university remained flat over the decade whereas broad satisfaction levels with other aspects of university life (Figure 2.7) actually increased in the latter half of the decade.

Figure 2.7 Broad Satisfaction Levels of Bachelor Degree Respondents to Course Experience Questionnaire



Source: Department of Education, Science and Training Statistical Collection

Outcomes

Since 1993, all graduates have been asked to complete a 25-item questionnaire by selecting a number on a five point scale indicating the extent to which they agree or disagree with particular statements.

The statements concern:

- the quality of teaching;
- the clarity of goals and standards;
- the nature of the assessment;
- the level of the work; and
- the enhancement of their generic skills.

In addition, students are also asked to indicate their overall level of satisfaction with their course.

Nationally, the percentage of bachelor degree graduates who were 'broadly satisfied'³⁰ with the overall quality of their courses increased over the decade (Figure 2.7). The percentage of students broadly satisfied with the five aspects of their courses measured by the questionnaire remained high over the decade, and except for assessment as mentioned before, satisfaction levels actually increased.

³⁰ Broad levels of satisfaction are based on the percentages of students selecting the 'top' three response categories for each statement in the questionnaire. The third response category is mid way between strongly disagree and strongly agree.

Analysis by the Australian Council for Educational Research suggests that variations in graduates' overall level of satisfaction with their courses and teaching seem to be largely attributable to differences between universities and differences between fields of study rather than to characteristics of graduates, although graduates over forty years of age expressed greater levels of satisfaction (Ainley 2001).

Other indicators (Table 2.11) suggest static or slightly improved outcomes for higher education students over the decade. For example, the ability of universities to retain their students remained steady over the 1990s³¹. Progress rates, which provide a measure of educational achievement and the effectiveness of educational delivery, were fairly constant for undergraduate students and showed a small increase for postgraduate students³². The proportion of graduates in full-time employment³³ as a percentage of graduates available for full-time work rose at the end of the decade,³⁴ however, it needs to be borne in mind that employment rates are affected by changes in economic performance.

Table 2.11 Selected Indicators for Australia

	1992	1993	1994	1995	1996	1997	1998	1999	2000
Crude Retention Rates %	77	78	78	78	78	78	77	77	n/a
Crude Progress Rates %	86	87	86	86	86	85	86	85	86
Undergraduate									
Crude Progress Rates %	89	90	90	91	91	91	91	91	91
Postgraduate									
Graduate crude full time employment rate %	70.6	71.1	74.5	78.9	80.6	79.2	79.6	80.8	84

Source: Department of Education, Science and Training 2002a and Characteristics and Performance Indicators of Australian Higher Education Institutions, 2000, Occasional Paper Series, 01B, Higher Education Division, DEST, 2001.

2.4 Increased investment in online teaching and learning

Of the many changes that impacted on teaching and learning in Australian higher education in the past decade, none has been more pervasive, more obvious or more costly than the move towards technologically assisted learning and, in particular, online teaching. With gathering momentum Australian universities invested more and more into the provision of educational technologies for their staff and students.

These changes occurred against the backdrop of the 'digital revolution' that changed the work of governments, businesses, vocational education providers, schools, libraries and archives, and impacted on just about everyone, especially in the advanced industrial world. The reasons for the dramatic uptake of the technology include: the impact of globalisation; the impact of the Internet; the emergence of large multinational and global enterprises drawing together media, entertainment, publishing, computing and telecommunications industries; the increasing mobility of both people and ideas around the world; rapid advances in technology; development of more user-friendly software; and the rapid shift towards a knowledge economy.

³¹ The retention rate excludes those students who complete their courses but includes students who transfer to another course within the institution. Students who complete one course but are retained in another course are defined as retained students (they are not excluded along with other completing students).

³² Research students are excluded on the basis that the notion of success in subjects may be problematic for research students.

³³ Graduates are asked their employment status four months after they have graduated.

³⁴ The employment indicator is based on the employment outcomes of Australian graduates only and refers only to graduates who were previously full-time students.

Across the higher education system a number of trends in university investment in electronic technologies can be discerned including:

- increasing use of digital technology in lecture theatres and other teaching spaces;
- provision of high bandwidth connections within and between campuses;
- provision of larger numbers of computer laboratories with extended access hours;
- installation of web-based learning environments;
- purchase or development of instructional resources in a variety of subject areas; and
- provision of staff development in the use of these various elements in the teaching situation.

In reviewing the dynamics of this transformation for the system as a whole, three major strands can be identified:

- the generalised movement towards greater use of educational technologies;
- the widening use of distance education materials and methods for on-campus as well as off-campus students; and
- the impact of government funding and other initiatives.

Each of these elements is dealt with below.

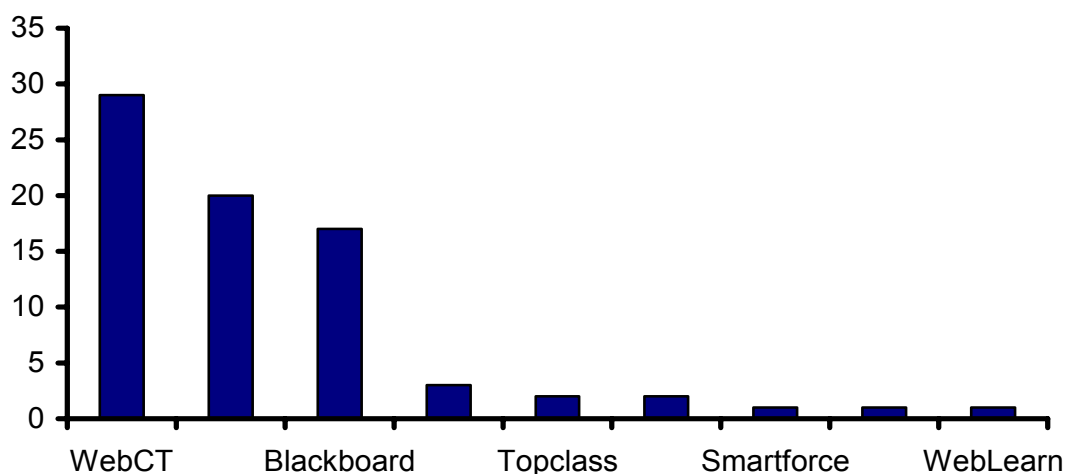
Greater use of educational technologies

At the beginning of the decade, the combined effects of larger class sizes and a growing enchantment with the potential of technology saw many universities investing heavily in 'smart' lecture theatres and other media-equipped teaching spaces. This facilitated the screening of videos and the broadcasting of lectures, as well as the widespread use of various electronic aids to teaching. As a further consequence of the push to outfit teaching spaces, there was a parallel effort to ensure that lecturers had ready access to personal computers. Books such as Laurillard's *Rethinking university teaching: A framework for the effective use of educational technology* (1993) contributed to a general shift towards electronically enhanced instruction.

The use of electronic technology in the classroom gradually changed into the use of such technologies in a modified form of self-directed learning, whereby students were able to access recorded lectures, video clips, and even electronic presentations to supplement (and in some cases to replace) lecture attendance. Eventually, since so many teaching resources (lecture notes, electronic slides, video clips, etc.) were being generated and stored electronically, it was only a short step to what has been labelled 'mixed mode' learning, where both on-campus and off-campus students were not only able to access and retrieve digital resources, but also to communicate with each other and with the teaching staff, both in 'real-time' and asynchronously, using various technologies including telephone, facsimile, email and bulletin board. In doing so, of course, the distinction between on-campus and off-campus study has become increasingly blurred.

Many universities installed web-based learning environments such as WebCT, Blackboard and eCollege to assist learning over the Internet (Figure 2.8) although not all universities have mandated a particular system so that in some universities several systems operate and some universities have developed their own in-house systems.

Figure 2.8 Learning systems used by universities 2001



Source: Department of Education, Science and Training (Bell et al. 2002)

The distance education tradition in Australia

Building on the original schools of the air and Australia's very early forays into correspondence education at both school and university levels, by 1990 Australia had a remarkable depth of expertise in what was then called distance education. In that year, the Government established eight distance education centres and gave them preferential treatment in the offering of off-campus teaching, to the extent that other universities were obliged to enter into contractual arrangements with them for the provision of their courses in distance mode. While this somewhat restrictive approach was revoked from the start of 1994, it did have the effect of consolidating a body of expertise that gave the original eight providers a considerable advantage when it came to offering online learning. However, even those institutions which were not directly involved in the centres, have benefited from that expertise and infrastructure, and there has been an explosion³⁵ in the provision of off-campus studies, much of it supported by online delivery³⁶.

Taylor (2001) has identified five stages in the evolution of distance education which reflect changes in the use of technology. They are:

- the correspondence model, where materials are print based;
- the multimedia model, where materials are presented in print, or via audiotape, videotape or computer-based learning;
- the telelearning model, which presents material using techniques such as audio or video-conferencing and broadcast TV or radio;
- the flexible learning model, providing learning materials by interactive online multimedia, computer mediated communication and Internet based resources; and

³⁵ For example, in 2001, the University of New England reported that more than 12,500 of its 17,000 students were studying via the Internet with students having access to 300 subjects online (University of New England).

³⁶ The report, *All that glitters is not gold: online delivery of education and training*, National Centre for Vocational Education Research 2000, defines online delivery as being where computers support teaching and learning; where there is a mixture of computer support and online delivery; and where computer technology alone delivers education and training. DEST has identified three categories of online learning – web supplemented; web dependent; and fully online.

- the intelligent flexible learning model, building on the fourth model, but also allowing campus portal³⁷ access to institutional processes and resources.

Even with the early models of distance education it was clear that a large number of the resources originally prepared to support distance education students could equally well be applied to support the learning of on-campus students. Everything from notes, handouts and readings, exercises and examples to video-taped lectures and demonstrations, was increasingly made available to all students over the decade. At first, the provision of materials via electronic technology was seen largely as an electronic extension of the old correspondence model, and the material was either sent to students or else placed in some kind of electronic library reserve. However, the widespread availability of information technologies in students' homes, workplaces and communities, combined with increasingly ubiquitous and reliable communications technologies, meant that such resources could be retrieved and downloaded remotely. This same convergence of information and communications technologies allowed students to communicate not only with other resources and with academic staff, but also with each other, thus ushering in a new era of interactive online learning. At the same time, this trend necessitated improved connectivity, so universities were increasingly obliged to ensure high quality access for both on and off-campus students. This, however, was quite costly.

Over the 1990s, a number of universities offered online access to education as described in Taylor's fourth model of distance education. By the end of the decade a number were working towards applying the latest model and not just for external students. For example, at the University of South Australia (2001), the online facility provides home pages for all academic staff linked to the courses they teach, access to course content and related study resources, teaching and learner support mechanisms including interactive communication capacity between teacher and students and among students, and administrative services related to teaching and learning. The University of Southern Queensland offers online courses where no printed material is provided. Students communicate with other students and the lecturer via online discussion groups (University of Southern Queensland 2001).

Government support for an online future in education

In the 1990s, the Commonwealth explicitly encouraged the higher education sector to adopt an online future, principally through funding mechanisms. It also sought to stimulate debate and innovation through the commissioning and publication of reports, discussion papers and other documents.

The Commonwealth recognised that the costs of infrastructure represented a major consideration for universities if they were to be able to participate fully and actively in the digital world. Through the National Priority (Reserve) Fund, and through the Regional Technology Infrastructure Fund,³⁸ the Commonwealth provided dedicated resources to allow universities, especially in regional locations or with multiple campuses, to invest in necessary cabling, servers and microwave links to allow them to provide the same level of campus connectivity as larger metropolitan providers. In addition to providing dedicated funds, the 'capital roll-in' in 1994, that combined capital and recurrent funding, has allowed individual universities to invest in any combination of 'clicks and mortar' that meets their needs.

³⁷ A portal is an Internet site that is not necessarily content oriented but focuses on providing links to everything on a particular subject. The term is increasingly being used to refer to vertical market sites that offer the same services such as banking, insurance or computers or to sites offered by large search engine providers that allow users to efficiently access sites on the World Wide Web.

³⁸ The Regional Technology Infrastructure Fund, known as 'Networking the Nation', seeks to reduce the disparities in communications ability between metropolitan and rural areas. The \$400 million fund is administered by the Department of Communications and the Arts. Applications for funds can come from State and Territory Governments, local councils, local companies and organisations in district and regional areas.

Combined with this, the Australian Academic Research Network (AARNET) and state-based high performance computing consortia have worked to provide broadband connections among institutions, between major capital city hubs, and between Australia and major overseas gateways, principally in the United States and Europe. More recently, there have been negotiations to provide 'Voice over' Internet services to universities, thus increasing the flexibility of communications and reducing telecommunication costs. The effect of this has been to allow for instantaneous communication between and among Australian universities, and to enhance linkages with overseas counterparts, which has been of inestimable value to teachers and students as well as to researchers.

The Commonwealth also recognised that excellent high capacity infrastructure, while a necessary condition for high quality online teaching, was not sufficient. It further assisted in three ways: funds to support the development (or adaptation) of first rate instructional materials tailored to Australian conditions; information about what is happening in other institutions and jurisdictions; and staff development. All three of these were provided, initially through the Committee for the Advancement of University Teaching and the Commonwealth Staff Development Fund, and then, as previously discussed, by their consolidated successor, the Committee for University Teaching and Staff Development and most recently by its sequel in turn, the Australian Universities Teaching Committee.

Collectively, these Committees assisted the adoption of online education by raising the status and profile of teaching and by providing funds to support teaching innovations and in particular the development of online teaching resources. They also facilitated the exchange of information and sharing of resources through publications, clearinghouses, teaching forums and by brokering and encouraging inter-institutional collaboration. Over the decade, there was an avalanche of publications³⁹ bearing on the online revolution which reflected an extensive debate on the use of information and communications technology in universities and which also informed policy decision making (see Appendix 2.1).

Online education in universities

The digital revolution impacted on universities in a variety of ways over the 1990s, some more visibly than others. Much of the revolution was behind the scenes, affecting technical specifications and capabilities; other changes have affected even conventional face-to-face teaching. The extent to which universities have invested in infrastructure for both face-to-face and online teaching has already been alluded to; unfortunately, however, no reliable statistics are available for the complete decade because the expenditure on digital technologies is increasingly submerged within the general operating expenditures of institutions and cannot be disaggregated.

When it comes to the development or adaptation of teaching materials for courses or parts of courses to online mode, three different strategies may be discerned: the conversion of formerly self-directed or self-instructional packages to digital form; the conversion of teacher facilitated (commonly print-based, but sometimes audio or video) distance education materials to online form; and the creation of entirely new online materials to supplement or to replace face-to-face instruction.

A survey of online courses and support conducted by the Commonwealth in 2001 found that over half of Australian universities offer courses online although most of these courses can also

³⁹ Publications were produced by organisations such as the Australian National Training Authority, the Business Higher Education Roundtable, the Commission for the Future, the National Board of Employment, Education and Training, the National Office for the Information Economy, the Department of Education, Open and Distance Learning Association of Australia, the Higher Education Research and Development Society of Australasia, the National Council on Open and Distance Education and the Australian Society for Computers in Learning in Tertiary Education. Some two dozen reports appeared over the decade from 1991 to 2001.

be accessed in the normal way. Far more postgraduate courses than undergraduate courses are delivered online (Table 2.12) and a significant number are only delivered in this way. Most universities are also providing online administrative and learning support services for students (Table 2.13).

Table 2.12 Online courses offered by universities 2001

	Undergraduate	Postgraduate	Other courses	totals
Total number of courses which can be accessed online	17	187	3	207
Courses which are only available online	5	58	2	65

Source: Department of Education, Science and Training (Bell et al. 2002)

Table 2.13 Online administrative and support services 2001

Services	All %	Some%	None%
The university provides a student Intranet	87.5	5.0	7.5
Students can access this Intranet from locations off campus (e.g. work or home)	70.0	20.0	10.0
New students can register/enrol for subjects/courses online	27.5	22.5	50.0
Existing students can register/enrol for subjects/courses online	40.0	27.5	32.5
Students can request variations in enrolment online	30.0	17.5	52.5
Students can pay university fees online	30.0	12.5	57.5
Students can view unit progress and final grades online	67.5	20.0	12.5
Students can access the library catalogue online	95.0	5.0	0.0
Students can access online journals or monographs	90.0	7.5	2.5
Students can reserve books online	82.5	7.5	10.0
Students can undertake online training to improve ICT skills	45.0	35.0	20.0
Students can access online learning support	57.5	37.5	5.0
Is the university's handbook and/or calendar available online?	Yes 92.5		No 7.5

Source: Department of Education, Science and Training (Bell et al. 2002)

Table 2.14 Online courses by discipline 2001

	Undergraduate	Postgraduate	Other Courses
Natural and Physical Sciences	0	13	1
Information Technology	2	19	0
Engineering and Related Technologies	1	3	0
Architecture and Building	0	0	0
Agriculture, Environmental and Related Studies	0	8	0
Health	3	29	0
Education	4	31	1
Management and Commerce	3	52	0
Society and Culture			
Creative Arts	1	10	0
Food, Hospitality and Personal Services	0	0	0
Mixed Field Programs	0	1	1
Unstated	0	2	0

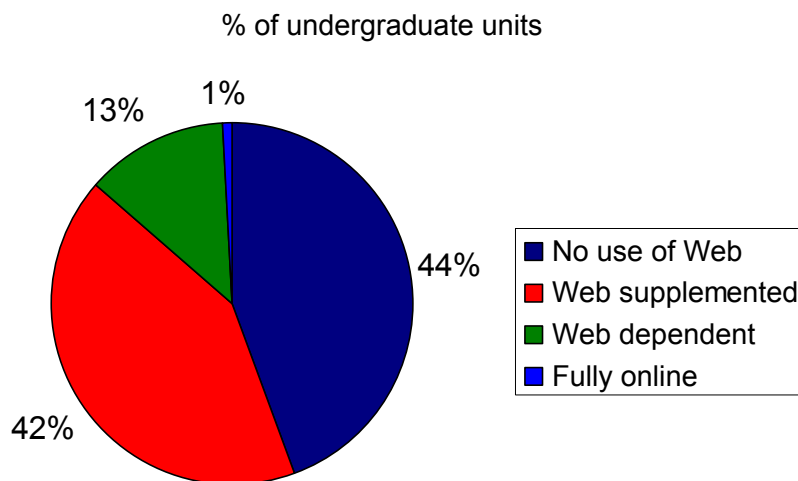
Source: Department of Education, Science and Training (Bell et al. 2002)

The number of online courses offered by universities is variable with most offering fewer than six, although one university offered 35 (33 postgraduate) courses online. The highest area of online course delivery was in the management and commerce area (Table 2.14).

Although only a relatively small number of courses are offered online a large number of units offered by universities involve some use of the Internet. Student usage can be divided into three categories: web supplemented where participation online is optional for the student and supplements traditional forms of delivery; web dependent where participation online is a compulsory requirement although some face-to-face delivery is retained; and fully online where no face-to-face component is involved.

As can be seen from Figure 2.9, a high proportion of undergraduate units are web supplemented although relatively few are web dependent and even fewer are fully online. Almost one half (44.4%) of undergraduate units make no use of the web at all, and although 42% use the web to supplement traditional forms of delivery, only 13.5% require students to use it in a way that is essential to their learning.

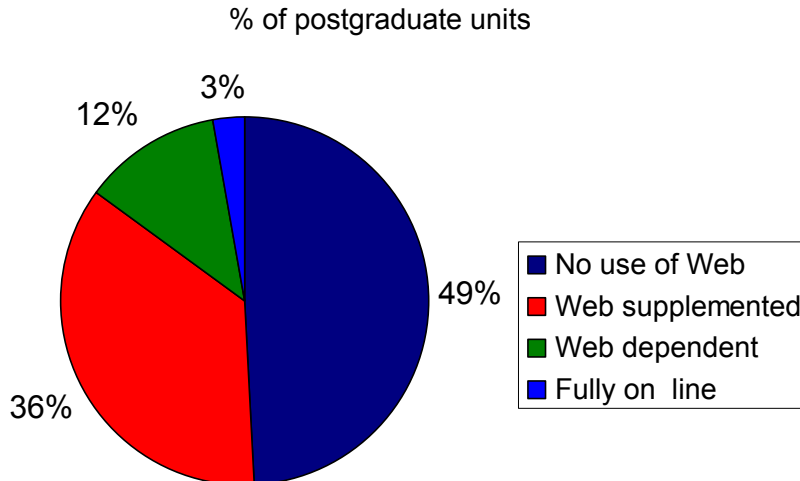
Figure 2.9 Extent to which undergraduate units make use of the World Wide Web



Source: Department of Education, Science and Training (Bell et al. 2002)

The situation is similar for postgraduate units (see Figure 2.10) although a higher number of postgraduate units make no use of the web (49.4%) and a slightly higher number (14.9%) make use of the web an integral part of the unit.

Figure 2.10 Extent to which postgraduate units make use of the World Wide Web



Source: Department of Education, Science and Training (Bell et al. 2002)

In terms of discipline areas, the greatest use of the Internet in units was, not unsurprisingly, in information technology (see Table 2.15). Although less than two per cent of information technology units at the undergraduate level were fully online just under a quarter of units required students to use the Internet to interact with the education content necessary for study and to communicate with staff and/or other students. At the postgraduate level, once again information technology units required the highest usage of the Internet although not as high as for undergraduate units. Just under 20% of postgraduate information technology units required students to both use the Internet to interact with the education content necessary for study and

to communicate with staff and/or other students and almost three per cent were fully online. At the undergraduate level, after information technology units, management and commerce and engineering and related technologies units were most likely to make use of the Internet, with around two thirds of the units in these discipline areas making use of the Internet. Over three times as many postgraduate units as undergraduate units were fully online, with units in the disciplines of education (4.3%), management and commerce (3.6%) and health (3.4%) most likely to be online followed by information technology.

Table 2.15 Web use by units by discipline

Discipline %	Undergraduate Total No. Units	Use of Web %	Postgraduate Total No. Units	Use of Web %
Natural and Physical Sciences	7,833	58.2	2,258	40.3
Information Technology	2,964	80.6	1,815	74.4
Engineering and Related Technologies	5,815	66.4	1,992	58.8
Architecture and Building	1,764	59.1	450	48.0
Agriculture, Environmental and Related Studies	2,171	57.0	1,033	58.1
Health	5,652	58.7	5,001	45.8
Education	4,611	52.5	3,385	46.5
Management and Commerce	5,377	68.3	4,492	58.8
Society and Culture	18,140	48.2	8,133	47.4
Creative Arts	8,826	44.5	1,753	43.3
Food, Hospitality and Personal Services	109	46.8	66	37.9
Mixed Programs	206	39.8		
Totals	63,194	55.6	30,378	50.7

Source: Department of Education, Science and Training (Bell et al. 2002)

Considering that it was not until the mid-1990s that the use of the Internet became widespread, and given the organisational challenges involved, it is remarkable that at the end of the decade around one half of all units offered at universities in Australia involved some use of the Internet. Although it is clear that in 2001 the Internet was mainly used by universities as a useful adjunct to teaching and learning, this is likely to change in the future as universities invest in information and communications technology and logistical issues are worked through making it easier for academics and students to make use of the technology. As an example of such developments, in 2001 University of Adelaide established an online learning and teaching unit and trialed a centrally supported learning management system which enables instructors to take responsibility for the content and design of their course offerings without having to learn web authoring language (University of Adelaide 2001). To increase compatibility, a number of leading information technology companies (Blackboard, Sun, Microsoft, Cisco, Oracle, Apple, PeopleSoft and WebCT) are cooperating on developing and complying with Instructional Media Standards (IMS) so that any content created by one system used by a university can be exported and used in any other IMS compliant learning management system⁴⁰.

With respect to online content, universities differ in terms of their actual approaches, some attempting to develop or to adapt their online resources in-house, others forming strategic alliances with other universities, and others again outsourcing this part of their role to

⁴⁰ The Commonwealth has supported the development of online technology standards through Australian participation in the IMS Global Learning Consortium and the establishment of the Australian IMS Centre to develop agreed technical standards for the development of online educational content and applications.

commercial partners such as those mentioned above. Partly because of the quasi-commercial nature of many of these decisions, no system-wide figures are available, but one national initiative particularly worthy of note is Open Learning Australia (Box 2.11), a company owned and controlled by eight Australian universities. Open Learning Australia does not itself grant degrees, but enrolls students in programs provided by the contributing institutions, and credited by the students' own home institutions, with a range of more than 300 units of study offered by more than 30 higher education institutions. Originally limited to print-based materials, supported by radio and television broadcasts, more and more of their courses now involve at least some online component. In 2001 Open Learning Australia offered 65 units fully online and a further 47 units had additional resources available via the Internet. In 2002 80 units will be offered online through Open Learning Australia's Learning Portal (Costigan, J. 2001, pers. comm., 6 Dec.).

Box 2.11 Open Learning Australia Online

George Ivanoff, Projects Officer with Open Learning Australia

OPEN LEARNING AUSTRALIA (OLA) <http://www.ola.edu.au> is a national education broker providing access to accredited post-secondary units and modules through distance education methods. It is jointly owned by eight Australian universities and has 29 Australian institutions providing units and modules, with a number of these also providing pathways into qualifications.

OLA aims to provide education through innovative and accessible methods. In addition to print-based materials, OLA units and modules have utilised television, radio, audio and videocassettes, and computer assisted learning packages. In 1995 OLA began to establish a presence on the World Wide Web. Since then, the OLA website, <http://www.ola.edu.au>, has grown into a resource for students, potential students, provider institutions, the media and researchers. In addition to its own site, OLA has also encouraged the institutions providing units and modules of study through it to develop online resources for students. There are currently thirteen separate websites for OLA units and modules which offer students a variety of resources such as unit outlines and content, past examination papers and discussion forums. These can be reached via the Student Resources section of the OLA Web site.

OLA also recently introduced its first completely web-based unit, "Services Marketing", provided by the Royal Melbourne Institute of Technology University. This online unit includes multiple choice test banks, a student discussion forum and links to companies so that students can conduct research. Other online projects have already been funded and are currently in development. OLA is keen for its providers to pursue web-based resources. Substantial funding has been allocated for the development of new online products with each of the eight-shareholding institutions.

From: <http://www.edfac.unimelb.edu.au/online-ed/mailouts/1997/aug8.html#anchor151171>

It is to be expected, following overseas examples, that more Australian universities will shift a greater proportion of their teaching into the online environment. Already a number of universities have adopted policies of placing all their units online. For some universities, going online is a logical extension of their distance education programs, for others it represents a commitment to a new way of doing business. The online survey in 2001 found that no particular type of university was more involved in online education than others and there was no discernible distinction between metropolitan and regional universities, or between traditional, technical and distance education universities. In the future, however, universities may seek to differentiate themselves on the basis of how they respond to developments in information and communications technology. It is possible to conceive of niche markets for virtual universities, universities that offer a range of learning modes and universities that emphasise their traditional face-to-face approach while providing some services online.

The uptake of digital technologies at the corporate or institutional level, however, tells only part of the story; the attitudes and competence of staff members will be vital determinants of the

success of such initiatives. Indeed, even more vital will be the acceptability and accessibility of such approaches to students and potential students.

Uptake by academics

The willingness of academics to teach online is based on three elements: access, ability and attitude. With respect to access, as previously mentioned most universities have worked hard to ensure that their faculty members have the required hardware and software readily available in their departments, if not on their own desktops. This trend commenced back at the start of the decade, or even earlier, and has continued throughout the period under review. It is now considered de rigeur for academics to have convenient access to high quality computing infrastructure for teaching, research and administrative purposes, and most universities have a standard expectation that all staff members will be connected to the institution's intranet as a matter of course.

The capacity to use information and communications technology in pedagogically appropriate and effective ways is also a major issue with online teaching. It involves not just placing material on the web, but also ensuring that it enhances learning and makes full use of the capacity of digital technologies. Winship (2000) argues that there is considerable variability both within and between institutions, and that many universities do not have either agreed standards of technological literacy or robust approaches to the development of such capacities in their staff. Although some universities have embraced such a specification, and have adopted strategic plans to facilitate the development of their staff, there is as yet no system-wide specification comparable to that which has been developed for either the school or vocational education and training sector.

There have certainly been a number of institutional analyses of the uptake of new teaching technologies, but few system-wide studies. A major Australian study of academics' attitudes towards the impact of electronic technologies in 1995 surveyed the opinions of 254 university staff with interests and expertise in technology and computer mediated communication in teaching, of whom 198 responded (Hesketh et al. 1996, p. xi). The study showed, unsurprisingly, that those technologies, practices and interventions with which the respondents were already most familiar were most likely to have an impact over the ensuing three to five years. Although there were questions about the (then embryonic) World Wide Web – it was not expected to make much impact in the immediate future!

However, two years later, a nation-wide quantitative survey of academics found that almost all respondents (96%) had access to a personal computer in their office at work which was connected to the Internet, and almost all of these had all the software and hardware they needed to connect to the Internet. Most made use of the World Wide Web: 28% at least daily, 39% at least weekly and 26% less than once a week. Only 7% reported never using it (Applebee et al. 1998).

Uptake by students

For obvious reasons the effectiveness of any online intervention depends on whether learners, and potential learners, can readily access the information placed online. Universities have worked hard to provide extensive on-campus access for students, for instance through computer laboratories and plug-in facilities in libraries. However, because of changing patterns of study and work, where, as previously discussed, many full-time students engage in extensive paid employment, such on-campus access has tended to become less relevant, and universities have accordingly concentrated on providing access either through direct dial-in or via an Internet Service Provider.

This raises two additional considerations; the first is the availability of appropriate, affordable telecommunications infrastructure, and the second is the availability of the relevant hardware.

With respect both to the availability of localised broadband connectivity and to the costs of telecommunications charges to dial into the nearest connection point, access is partly a matter of technology and partly a matter of economics. The National Office for the Information Economy (NOIE 2001) found that more than 50% of Australian adults were online and nearly 40% of households had Internet access. Although there are no robust statistics available at present on the extent ownership, or at least convenient availability, of appropriate computers and modems among the student cohort, one study of Australian tertiary students found that over 95% of university students reported that they made regular use of information and communications technology (Oliver and Towers 2000) and surveys by individual universities suggest high levels of access to the Internet. Since students are increasingly representative of the community at large and especially as many of them work, it is reasonable to assume that university students have the same, if not higher, levels of access to the Internet.

Winship (2000) claims that:

overall, the IT Literacy of students appears to be very variable across and within most of the respondents' universities....there is considerable variation between departments in terms of IT use by students, considerable variation between categories of students in terms of IT use, and pockets of non-users in all categories of students.
(p. 2)

Most universities, however, provide some basic information literacy training for students. For example, Charles Sturt University provides a short 13 hour learning skills course on online learning which students may work through at their own pace (Charles Sturt University 2001).

It can be argued that recent technological advances mean that computer-aided learning, with the capacity for interactive experiences involving voice, pictures and text transmission, is at least the equal of conventional face-to-face instruction in a lecture theatre or tutorial. It may be some time, however, before this view is universally shared. It is more likely that the use of information technology will be regarded as an extension to traditional lectures and a mechanism for improving the flexibility rather than a replacement for face-to-face lectures which retain the advantage of engagement and dialogue with lecture participants. It is used this way at the University of Western Australia, for example, where a lecturer can walk into a lecture theatre, turn on a microphone and give a presentation to students, which an hour later, without any human intervention, appears on the web page of the unit to which students can log on to from anywhere in the world (Hill 2001).

However, while students are positive about the convenience of course materials being available on the web, they do not necessarily prefer this way of teaching nor do they necessarily learn more effectively. One study of Australian first year university students found that web-enhanced instruction did not prove more effective than traditional face-to-face instruction (Oliver 2001). This could have been due to the fact that students tended to use online course materials in a passive way, as notes and memory aides, rather than taking advantage of the power of the technology to interact and engage with the online material. While the results may have been different for postgraduate students, they emphasise the need to prepare students for online learning in order to ensure that the technology enhances the learning process, especially as web-enhanced instruction is time consuming and costly to develop. Interestingly, first year students believed that a knowledgeable, personable and encouraging teacher was their most valued educational resource.

2.5 Emerging issues

In many ways, the issues emerging from the 1990s reflect ambiguities about the role of academics and universities that have always been present and fuelled many debates in the past, as well as reflecting a general unease about change. The pace of change in the 1990s

seemed to have gathered momentum compared with previous decades and the transforming force of that change foreshadowed fundamental alterations in the work of academics and the nature of universities.

The roles of universities and academics

After the Second World War considerable importance was accorded to research in Australian universities often with little heed to the need to foster excellence in teaching:

... It is quite understood that in making appointments to their permanent academic staff universities will wish to pay great attention to the qualifications and achievements in research of the person to be appointed. As has been said before, research ability and enthusiasm is necessary to a good university teacher. Equally, however, it is clearly a primary responsibility of a university to see that its first year students are well taught and therefore that it has enough good teachers to teach them. To this extent the universities clearly have an obligation to see that in making academic appointments they are securing sufficiently good teaching strength to deal with the first year problem.

(Murray 1957, p. 39)

Given the levels of funding and kudos attached to research it is not surprising that over the years it gained prominence over teaching in universities. However, in the 1990s, there was a growing emphasis on the need for academics to be good teachers as well as researchers. The dilemma for academics is how to marry these two roles given that generating quality research can leave very little time for the preparation of innovative teaching material and curriculum and that the rewards of research still seem greater than that of teaching. Furthermore, new approaches to teaching and learning may actually increase the tension between teaching and research duties.

Staff fear heightened conflict between their teaching and research obligations, given the initial investment of time which the development of flexible delivery requires.

(University of Queensland 1997, p. 11)

Academics are not faced with such a dilemma in the United States where only a small proportion of universities undertake research and offer research doctorates and academics in these universities have reduced teaching loads. The question has been raised in the past (Department of Employment, Education and Training 1993), as to whether all academic staff should continue to be both teachers and researchers and further, whether the pursuit of a broad research profile is necessary or desirable for every university. It seems that Australian universities have not, on the whole, supported such a dichotomy mainly because of the perceived and real benefits of research and also because of the perceived value of cross-fertilisation between these two aspects of academic work.

It can be argued that truly scholarly teaching involves tapping into the resources of those involved in discovery, understanding and synthesising these resources, and communicating their import. This conception of a scholarship of teaching, as no less intellectually rigorous and important than research, places the work of teachers in universities on par with that of researchers. It prompts a vision of a higher education system with an appropriate depth and concentration of academics conducting world class, cutting-edge research, as well as a cohort of first rate teaching academics supporting student learning and developing their capabilities for lifelong learning. In the future, it may be possible for Australian universities to be positioned anywhere on a spectrum ranging from purely research to purely teaching institutions and still be esteemed and influential.

What distinguishes an academic in a university from a teacher in a school if they no longer undertake research? It would seem that the answer to this question would lie in the value placed on the depth of expertise of academics and their individual analyses which gives them

the autonomy and authority to develop curriculum, to teach it as they judge best, to assess students and to evaluate material produced by others. However, this 'lone ranger' model of curriculum development by individual academics is being challenged by education developments centred on the team rather than the individual:

It is clear that substantial adoption of flexible delivery will involve changes to the teaching roles of academic staff. One such change will be a greater emphasis on teamwork, ... subject development will entail collaboration between academic staff, who will remain responsible for subject content and delivery, and other professional staff, who will be responsible for facilitating the delivery methods. Another change may be the more flexible scheduling of teaching activities, and a further change may be different forms of interactions with students.

(University of Queensland 1997, p. 12)

In the 1990s there was increased collaboration to develop curriculum, not only because flexible delivery modes necessitated it, but also as a way of reducing duplication of effort between universities where it was feasible for them to share a common curriculum, and as a way of dealing with small course enrolments. The Commonwealth increasingly encouraged collaboration of this nature. In 2001 the Australian Universities Teaching Committee funded collaborative projects on learning outcomes and curriculum development in law, nursing, arts, biotechnology, and business and the role of information and communications in flexible delivery, which involved a significant number of universities working together. (Box 2.12 gives further examples of collaboration between universities.) The sharing of curricula may well be the way of the future if the example of the open learning archive project led by the Massachusetts Institute of Technology in the United States is anything to go by. It is making all of its curricula content available on the Internet (Schrage 2001).

Box 2.12 A collaborative approach

In the past, few of the cooperative relationships formed among academics were developed into formalised partnerships. In the 1990s a shift appears to occur from the sort of diverse and fortuitous collaborations pursued out of academic interest to an 'ad hoc' and then more strategic alliance formation between universities and between universities and other organisations.

Two examples of strategic collaboration are:

The Collaborative Online Learning and Information Services (COLIS) project

This project involves Macquarie University and the universities of Newcastle, New England, Southern Queensland and Tasmania. The project is developing a model for institutional interoperability which will enable the seamless sharing of online learning and scholarly information resource. It will allow Australia to contribute more fully to the work of the major players in this area - IMS Global Learning Consortium and international software companies

Institutional Design, Implementation and Distribution of Multimedia-based Instruction

This is a collaborative venture involving Monash University, the universities of Melbourne and Queensland in developing advanced level sociolinguistics subjects in French, Italian and Spanish with full student support via the Web. In doing so, the universities are creating an inter-institutional core of specialist courseware developers with the aim of extending the models to apply to additional courses. Such alliances can help to increase competitiveness, reduce costs and enhance domestic campus-based operations.

Overall, collaboration can assist universities to:

- fill gaps in their expertise;
- pool their expertise to achieve the critical mass required for a particular initiative;
- enter new markets;

- share financial risks;
- get products and services to market faster;
- improve efficiency and productivity; and
- build reputation and attract investment.

Breakthroughs in the capacity, speed and availability of communications and information technology and changes in the employment conditions of staff facilitated the participation of Australian universities in national and global alliances such as consortia networks involved in teaching-related activities such as curriculum design, materials development, information delivery and student feedback and assessment.

The multiple alliances that universities began to form in the 1990s mirrored the types of alliances found in the business sector, in many respects. All four types of multiple alliances models identified by Harbison et al (2000) – franchise, portfolio, cooperative and constellation were to be found in the higher education sector⁴¹.

An example of a franchise type of arrangement was Charles Sturt University arranging through Martin College to have its Master of Business Administration course delivered in the United States of America, the United Kingdom, Ireland, Spain and Australia.

A multiple alliance approach has been used by the commercial arms of some universities such as Deakin Prime and INDELTA.

An example of the cooperative model is the Australian Technology Network of eight technological universities, which partnered to produce shared online modules for higher degree research students to develop generic skills such as entrepreneurship.

Examples of the constellation model are alliances of universities to establish branding and compete globally, such as Universitas 21 and the Global University Alliance.

Both the effect of government programs encouraging collaboration and the imperatives of contemporary competitive environments have acted to shift universities from self-reliant competitiveness towards cooperative competitiveness. How far along this spectrum the universities have travelled is not quite clear as little of this activity has been systematically documented and monitored. However, the scope for cooperative competitiveness appears greatest in respect of global teaching consortia networks as collaboration in the area of educational content, largely driven by government until recently, is increasing within groups of collaborating institutions seeking to service fee-paying markets.

Several aspects of the core business of universities already are being transformed through the processes of collaboration. With regard to teaching, for example, some alliances are already developing shared databases of learning objects⁴² and will likely begin rationalising production of educational content within their networks, so replacing a fair proportion of course components and materials currently developed locally in each university. The expanding capacity of online communications to deliver such content virtually anywhere, at any time, with varying forms of student-teacher and student-student interaction; together with the new specialisation of teaching-related functions such as tutoring and assessment, will require universities to reconsider how they add value and remain attractive as places of learning, and reconfigure their operations to engage learners in ways and at times convenient for them (McInnis 2001).

⁴¹ The franchise model involves an alliance between a company and one discrete class of partners. The portfolio model involves multiple classes of alliances managed as a portfolio by one company. The cooperative model involves alliances between many comparably sized peers. The constellation model involves multiple interdependent alliances led by two or more comparably sized peers (Harbison et al. 2000).

⁴² The University of New South Wales is working with Universitas 21 to catalogue all digital learning objects in use across the consortium with the aim of providing a shared resource.

In this context, the individual academic may cease to be central to the educative process. Instead of their role being one of an expert who has unique and valuable insights and knowledge to pass down to students, it may be one of guiding students' self-directed learning using materials developed by others. So that:

The broad aim is for the University to provide a learner-centred environment in which teachers see their role primarily as that of scholarly resource specialists and professional mentors who help students become independent in their ability to discriminate between data, information, knowledge and wisdom.

(Reid 1999, p. 2)

The teaching role of academics is also likely to be affected by the dissolution of boundaries between education providers and the 'unbundling'⁴³ of higher education teaching. The unbundling of higher education is a process by which the components of the curriculum and teaching and learning processes are disassembled and developed, packaged, marketed and delivered separately by a variety of providers. Activities such as course design, content determination, materials preparation, lecturing, tutoring, student feedback, assignment marking, student support, additional student services and assessment do not necessarily have to be undertaken by academics. As a result, new specialisations of labour to develop learning experiences are evolving that do not necessarily involve academic work (Cunningham et al. 2000).

While these developments are likely to have significant implications for the future of academic work, and some fundamental change has already occurred, it is worth noting that some universities see room for a variety of approaches to teaching:

the literature on effective teaching in higher education suggests that there is no straightforward formula, no single way of helping people learn. Students testify that they have learned well in a variety of contexts, from a variety of teaching styles, ranging from the charismatic, brilliant lecturer to the non-interventionist, supportive facilitator. Fashions come and go in education as in other fields and it is important for universities to maintain a sense of complexity in this area, allowing room for individual perspectives and approaches.

(policy first prepared in 1994, Monash University 2001a, p. 1)

According to one university, the 'wholesale abolition of current teaching practices, including face-to-face lectures, is neither feasible or desirable' (University of Queensland 1997, p. 12).

Catering for popular demand or intrinsic worth

In the 1990s there were some concerns that less popular, more theoretical subjects would be swept away in the wake of growing instrumentalism. Indeed, fiscal constraints on universities meant some courses with very low enrolments, particularly in the field of languages and some traditional fields of science, were under threat. At the same time, there was some pressure to maintain non-viable subjects which were considered to have intrinsic value because of their importance to the community or the national interest or the aims of the university.

Flexibility and collaboration have been the keys to the survival of a number of very low enrolment courses. For example, a number of universities have set up collaborative arrangements for the teaching of languages with low student demand by sharing staff and resources or by entering into agreements which allow students from one university to have access, through distance education, to a language course offered by another and vice versa. Another approach is to share teachers within a university. For example, physics lecturers might

⁴³ See the concept of vertical disintegration discussed in chapter six.

teach physics units in engineering and other courses thus helping to ensure the viability of a physics department and helping to maintain a research capability in this area.

In 1998, the Commonwealth funded the *Maintaining Student Choice Initiative* to examine the possibility of producing online courses so that students from one university would be able to participate in a particular language course delivered by another university. In 2000, the Australian Academy of the Humanities published a report *Subjects of small enrolment in the Humanities*. While stressing the value of face-to-face teaching, particularly in languages, the report acknowledged the collaborative work done through the use of multimedia like videoconferencing to share teaching and learning resources in subjects of low enrolment. The use of information and communications technology in subjects of low enrolment may offer a solution to what is likely to be an on-going issue as demand for courses changes.

In the United States, there appears to be a growing trend to deal with the issue of low demand subjects by developing 'selective excellence', a concept based on the view that to succeed universities must sharpen their educational focus by concentrating on specialised areas of strength or on areas of high student demand. Rather than emphasising their comprehensiveness some universities in America are focusing on developing a core business which appeals to a sharply defined niche market. Rather than instigating across-the-board cuts in response to fiscal constraints the strategy of selective excellence in a limited number of areas suggests that universities should target their cuts to specific areas that do not align well with the core business of the university. One survey conducted by the Association of American Universities found that nearly 60% of its members were consolidating, eliminating or reducing academic departments (Barrow 1996).

If Australian universities were to move more towards the selective excellence mode it might make it more difficult to maintain courses with low student demand. It would challenge universities and governments to identify those non-viable courses, if any, which merit protection and to determine how best to provide support.

Meeting the challenges of a digital age

One challenge for universities is to keep a sense of proportion when digital technologies offer such huge potential especially in terms of changing teaching and learning practices. It is unlikely that all the excessive and extravagant claims that have been made about information technology will be realised, at least in the near future.

Given that the costs of developing high quality online resources are high, another challenge is to avoid duplication and redundancy. It is not an inexpensive option to develop courses although the costs per student can be quite low once the course is available. In order to avoid duplication, universities must develop more collaborative approaches, which can be difficult not only because of academic territoriality but because of commercial imperatives in an era of competition. Although there have been massive achievements in the past decade, some argue that universities have operated well within the envelope of available resources, and given the costs of producing high quality teaching materials, there is;

an urgent need for a coherent national policy for post-secondary education as a whole...which is developed in tandem with other national policies on telecommunications, broadband capacity, copyright and IP, taxation and World Trade Organization policies, all underpinned by a recognition of education funding as an investment in the country.
(Ryan 2001, p. 34)

Another challenge for universities is to avoid creating a digital divide. Discussions about the digital divide tend to be dominated by technological concerns, notably with respect to broadband connectivity, or economic issues, such as telecommunications charges, that lie beyond the institution's power. However there are other, subtle aspects which affect student

participation such as the provision of adequate information literacy and information technology literacy training, the design of sites which do not demand excessively expensive hardware to access them and the provision of adequate resources for students⁴⁴. Geographic isolation may mean that some students are effectively unable to participate in interactive sessions or to access the graphics and some of the more elaborate or interactive forms of software and courseware available because download times are too slow. The costs of STD access to university providers may also be considerable. Attention may need to be given to putting in place assistive technologies to ensure that students with various kinds of disability have access to the digital or online environment.

Digital teaching allows students to proceed at their own pace, in the privacy of their own home, workplace or community, however, not everyone wants to learn alone and, from the students' point of view, after issues of affordability, connectivity and confidence, one of the major concerns is the social dimension of online learning. In this respect, it will be important to develop new pedagogies that ensure that the online experience is an enriching one. The development of online teaching has tended to follow two quite distinct trajectories; on the one hand there are those who have tried, to a greater or lesser extent, to incorporate digital information into their traditional teaching approaches. The setting of curricula, the sequencing and pacing of learning, the range of resources to be consulted and the forms of assessment to be fulfilled are all determined, as they have always been, by the teacher. On the other hand, there are those who see online teaching as liberating and empowering, who recognise that the world of information is limitless, and who see the digital or virtual world as an intellectual frontier.

2.6 Conclusion

The 1990s was a period of transition for the Australian higher education sector. Universities became increasingly self-reliant after a period of high dependency on the Commonwealth as the major source of revenue. They did this by diversifying their revenue sources and by responding to market pressures. With declining demand for places over the decade universities had to compete with each other for students at a time when most students were paying for their education, either through the Higher Education Contribution Scheme or fees, and therefore had greater bargaining power. It was more imperative than ever for universities to be able to attract students and in this context, the educational developments that took place in the 1990s reflect a growing focus on the student as a customer.

Universities responded to student demand by increasing the number of courses available and identifying and developing a wide range of specialist areas of study; offering a greater variety of postgraduate courses; tailoring courses to meet students' needs especially by linking them to industry or professional qualifications or articulating them with TAFE courses; and providing flexibility in the way course units could be assembled or studied. Universities were able to market these options to prospective students, both inside and outside the country, on an unparalleled scale. There was a concern that in a demand-driven system some subjects with low enrolments would fall by the wayside. To some extent, especially in the languages area, this concern has been addressed by universities through collaboration and the use of information technology. Ultimately, however, universities and governments will need to determine if intervention is warranted to protect subjects with low demand.

One of the major changes that occurred was the abolition of the binary system of colleges of advanced education and universities. As a result, new universities were established at the beginning of the 1990s as part of the national unified system. There was a greater emphasis on vocational pathways and along with this came concerns that universities were moving away

⁴⁴ See 'Knowledge Indignation: Road Rage on the Information Superhighway', Radio National Background Briefing, at <http://www.abc.net.au/rn/talks/bbing/stories/s345514.htm>

from their true purpose of providing a broad-based education. In actual fact, universities in Australia had always done both and the types of courses offered by universities over the years reflected changes in demand as well as what was considered to be important at the time for the national interest. Along with specific skills and knowledge related to particular professions, employers expected graduates from universities to possess capabilities such as critical thinking, problem-solving abilities and communication skills and universities began to embed these generic attributes in the curriculum.

A significant number of students sought additional qualifications in the form of double degrees, additional bachelor degrees, graduate diplomas and certificates, and external qualifications from TAFEs, professional associations and companies. Many students undertook postgraduate work by coursework especially in the economics, business and administration field of study.

In many ways there was a reconceptualisation of teaching and learning and curriculum in universities. New courses were developed and courses revised to reflect new areas of knowledge and interest; a more multi-disciplinary approach; changes in pedagogy; and the emphasis on developing generic attributes. At the same time, much greater attention was paid to the quality of the teaching and learning experiences of students at university. Pedagogical developments led to experimentation with student-centred, flexible learning and flexible delivery modes much assisted by breakthroughs in information and communications technology. The new ways of developing, presenting and delivering course material called for more collaborative approaches and began to challenge the traditional role of the individual academic in the process. The drive to improve teaching and curricula at universities highlighted the tension that seemed to exist between the role of the academic as researcher and the role of the academic as teacher. Initiatives were put in place to improve the professionalism and status of teaching in universities and the appropriateness of every university pursuing a broad research agenda was questioned.

At the end of the decade graduates were generally more satisfied with the course experience than they were at the beginning of the 1990s. One area that showed little change was their satisfaction with their assessment at university. There was some movement towards a greater use of assessment in its diagnostic capacity to both assist the student and to improve teaching and learning but towards the end of the decade there appeared to be a trend, perhaps as a result of larger class sizes, to fall back on less-demanding methods of assessment which focused on assessing knowledge.

Information and communications technologies, especially the growth of the Internet and the World Wide Web, had an increasingly significant impact on universities over the decade. The uptake of fully online learning was patchy with most universities opting to use the Internet as an adjunct or enhancement to their traditional approaches. However, 'as information technology infrastructure develops, radical consequences should be anticipated' (Reid 1992, p. 2).

Appendix 2.1 Government Reports on Convergent Technologies in Higher Education since 1991

Barraket, J., Payne, A., Scott, G. & Cameron, L. 2000, *Equity and the use of communications and information technology in higher education: A UTS case study*, Evaluations and Investigations Program Report Number 00/7, Higher Education Division, Department of Education, Training and Youth Affairs, Canberra,

Bruce, H. W. 1996, *Internet, AARNet and academic work: A longitudinal study*, Evaluations and Investigations Program Report Number 96/9, Higher Education Division, Department of Employment, Education, Training and Youth Affairs, Canberra.

Caladine, R. 1993, *Overseas experience in non-traditional modes of delivery in higher education using state-of-the-art technology: A literature review*, Occasional Paper Series, Higher Education Division, Department of Employment, Education and Training, Canberra.

Cavalier, R. (Chair). 1996, *The implications of technology for language teaching*, Commissioned Report Number 52, Australian Language and Literacy Council, National Board of Employment Education and Training, Canberra.

Cochrane, T., Ellis, H. D. & Johnston, S. L. 1993, *Computer-based education in Australian Higher Education: A case study at the Queensland University of Technology*, Evaluations and Investigations Program Report Number 178, Higher Education Division, Department of Employment, Education, Training and Youth Affairs, Canberra.

Cunningham, S., Ryan, Y., Stedman, L., Tapsall, S., Bagdon, K., Flew, T. & Coaldrake, P. 2000, *The business of borderless education*, Evaluations and Investigations Program Report Number 00/3, Higher Education Division, Department of Employment, Education, Training and Youth Affairs, Canberra.

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Building a University in the 1990s

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To make any sense of the shape and texture of the Australian higher education system in the 1990s we need to go back much further than the 1980s. The last decade of the 20th century was the most turbulent of all for Australia's universities, but the source of that turbulence did not lie mostly in the actions of unthinking governments or negligent vice-chancellors. Three broad changes in Australian society in the second half of the century intersected in the late 1980s to produce a time of upheaval in higher education. The first of these changes was a steady increase in the numbers of people seeking education at the post-secondary level. The second was a consequent change in the general conception of what higher education was. The third was a change in the extent to which Australian society was prepared to tax itself to do things through the public sector.

In 1950 there were little more than 30 000 students in higher education in a population of eight million or so. By the end of the century there were around 700 000 students in a population of 18 million. This astonishing increase (matched in much of the developed world) itself had three causes: a high post-war birthrate, a great increase in the demand for people with knowledge-based skill and the 'outsourcing' of training by the professions from the workplace to higher education institutions. The institutional forms and structures devised to accommodate this sustained increase in demand underwent progressive change. Finally, Australian state and Federal governments found that the cost of higher education kept growing inconveniently, and from the late 1950s tried different methods to deal with the funding of growth. None of them was successful for long.

The intersection point of these broad changes was the late 1980s, and for a political reason. In July 1987 the newly re-elected Hawke Labor Government dealt with the complexity of traditional administrative arrangements by establishing a two-tier system of Cabinet government, with senior and junior Ministers for a set of 16 major portfolios. Education, training and research became the responsibility of a 'mega-department' named Employment, Education and Training (DEET), whose Minister was a strong, self-confident and reforming West Australian, John Dawkins. All the existing administrative and advisory arrangements for these domains themselves had to be changed, since responsibilities which had once been in separate departments were now united. The new Minister thus had an unusual degree of freedom in action.

He had a number of important and urgent matters to deal with at once. The binary system of higher education, in which 'universities' were funded for research but 'colleges' (of advanced education) were not, was an egregious anomaly, about to explode because several state governments were planning to rename some of their colleges as universities. There was an urgent need for more money to be pumped into the system, but as a former Finance Minister Dawkins knew that it was impossible to provide the needed funds unless students accepted some of the cost of their own education. The arrangements for supporting research in higher education were antiquated, uncoordinated, and poorly funded. All these responsibilities were now within his department, and he had a useful report on his table showing him a way forward. Finally, he had to set up a new advisory system, for two reasons. First, universities and colleges were essentially autonomous bodies established by acts of parliaments, and second, his own department did not and could not have all the expertise necessary to advise him on the best decision to make in a given instance.

Dawkins acted quickly and decisively. He decided not to use any of the advisory systems that he had inherited, and formed a group of personal advisers from within the system whose views he knew and sympathised with. Very soon afterwards he announced that he would establish a 'National Board of Employment, Education and Training' (NBEET) that would be the official conduit for advice from the sector. The Commonwealth Tertiary Education Commission, the

previous ruler of the system, was dispensed with. He issued first a Green (discussion) and then a White (policy) paper on higher education whose principal effect was the amalgamation of most of the colleges with most of the universities. Within a few years 19 universities and 46 colleges had become 38 universities on 122 campuses in what was called 'the unified national system' of higher education. The binary system was over. The Minister found the needed money for funding as an advance from the public purse but also set up a committee which advised him on how students should contribute to funding through what was to be called the Higher Education Contribution Scheme (HECS). He brought together all the research responsibilities of his portfolio, and gave them to a new body called the Australian Research Council (ARC). To make sure the council had increased money to discharge its duties he first diverted funds from the operating funds of the universities and then increased its allocations from Treasury.

These actions were themselves examples of great change, and each was to cause further great change. Dawkins was, for a time, an intensely disliked Minister within the sector for which he was responsible. Nonetheless, his changes were appropriate and inevitable, and they have lasted. The Australian Research Council and the Higher Education Contribution Scheme both under great attack in the beginning, were later greatly defended by the sector. Nearly fifteen years later, only his advisory conduit, the National Board of Employment, Education and Training, has gone. But there is no great desire, within the sector, to go back to the advisory structures of the past. No one talks today about the unified national system, but its elements remain, and flourish.

One of them is the University of Canberra. In the binary system it had been the Canberra College of Advanced Education (CCAEC), the Commonwealth's only essay in this form and an institution designed to be an example to the States. John Dawkins had wished to merge it with the Australian National University, the other significant higher education presence in the national capital, but had been unsuccessful, despite the fact that both were Commonwealth statutory authorities responsible to him. Neither institution wished to merge, and the ANU was able to use public pressure to block the change in the Senate. Dawkins then decided to make the Canberra College of Advanced Education a university in its own right, and it became the University of Canberra (the University of Canberra) at the very beginning of 1990.

I became the vice-chancellor of the University exactly one year later, its first vice-chancellor (and former the Canberra College of Advanced Education Director), Professor Roger Scott, having been appointed Director-General of Education in Queensland in the middle of 1990. I arrived after ten years in the research funding and science policy business, the last five of them as the Chairman of the Australian Research Grants Committee and then of the Australian Research Council, along with a term on the Australian Science and Technology Council and several other advisory bodies. I had also been a member of John Dawkins' so-called 'purple circle' (a newspaper coinage) and an executive member of the National Board for Employment, Education and Training.

My appointment as chief executive officer of a new university, and one that had not been funded for research, seemed to some an indication that the University of Canberra would go full speed ahead down the research track. In fact ten years of the research business, and especially of having to persuade Ministers and senior public servants of the need to find money for it, led to a considerable disenchantment on my part. Notwithstanding the rhetoric of the importance of 'pure' research, which I heard all the time, and indeed had pronounced myself, in the beginning, I had come to see 'research' as intimately bound up with the career advancement of individual academics and with the continuing institutional competition for prestige. Neither of those outcomes seemed to me to justify large sums of public money. I also saw research as having distorted the real business of universities: education. I had spoken and written about the need for other paths to honour inside universities other than the research path, and the University of Canberra seemed to me to be the right kind of environment in which to try some alternatives. I also felt that there was a danger that the newer universities, and the former colleges trapped

inside old universities, would all incline towards the 'research is good' model offered by the old universities, which I saw as not only outdated but costly.

Accordingly, I argued that the University of Canberra should concentrate on what it was good at, which was a blend of high-quality, student-centred teaching and the kind of applied research which industry, government and community organisations want done and will pay for. Furthermore, we should avoid the mad scramble to get bigger, and do our best to get better. Finally, we would use our position in the national capital to become better known nationally and internationally. A smallish, high-quality university in the national capital devoted to these ends had a good chance of coming through the ruck and establishing a long-term and valued identity.

Twelve years later it is only possible to provide an interim report on progress. In 2002 the University of Canberra is much the same size as it was in 1990 (between 9000 and 10 000 students). Its expenditure is over \$100 million, compared with \$53 million in 1990. In the earlier year more than 90 per cent of the University's expenditure came as recurrent funding from the Commonwealth. In 2001 37 per cent came as Commonwealth recurrent funding, 23 per cent from the Higher Education Contribution Scheme trust fund (that is, from Australian undergraduate students), and 40 per cent was earned from a great variety of sources, most of them other kinds of teaching, and research. The University of Canberra's students come from all States and Territories and from 92 countries overseas. Entry standards are high (there is no 'tail' of lower-achieving applicants, and no marginally funded students), and the employment rates and starting salaries of its graduates are at the top of the system. The University teaches overseas in a dozen cities, in association with foreign university and other partners. It is the headquarters of one of Australia's most highly regarded Co-operative Research Centres, a major partner in a second, and one of a number of universities linked with a third. The University has learned how to develop the good ideas of its staff in a way that profits the staff member as well as the University. The University of Canberra is the base for three of the system's most interesting endeavours: the National Centre for Social and Economic Modelling (NATSEM), the Australian Mathematics Trust, and AGRECON, a university-based company that provides spatial imagery to farms, banks and insurance companies — indeed, to anyone who needs it. Between a fifth and a quarter of the University of Canberra's students are postgraduates, but only a minority of them are undertaking PhD degrees. The great majority are advancing in their professions by undertaking further professionally relevant degrees and diplomas. It takes a long time to build a first-class university, and there are no universally accepted standards of measurement. But, judged by the standards operating at the beginning of the 21st century, the University of Canberra is at least on the way.

There was no inevitability about its progress. It was not at all clear at the beginning of the 1990s how the new unified national system would develop, and the attitude of government was that such a question was essentially one for the universities themselves to provide. The newer creations also had to put up with a kind of lofty disdain from those older, as well as a clamant cry from the oldest (which were eventually to distinguish themselves from the others as 'the Group of Eight') to the effect that they should be given special treatment because they did most of the research. In addition, the Unified National System quickly became highly competitive, and competition increased when the Labor Government was replaced by the Coalition in 1996. The University of Canberra did not seek (and was not invited) to join 'the Australian Technology Network, a loose grouping of the former metropolitan institutes of technology when it was created in 1997, (the Canberra College of Advanced Education had belonged to an earlier version), and settled down to the realisation that it was on its own and had better get used to it.

The tag that the University of Canberra 'educates professionals, professionally' arose from the first University representative taskforce set up in 1991 to worry about questions of identity and mission. The tag was adopted quickly within the University and provided a unifying statement that helped direct efforts. Further such taskforces in subsequent years provided similar stimuli in areas such as the University's physical environment, its administrative systems, its student residences (the University of Canberra has Australia's largest integrated student residential

system) and its international role. A lot of effort went into enhancing the University community, improving its buildings and grounds, developing a welcoming ethos and securing staff, senior and junior, who were in sympathy from the beginning with the University's mission. There was a continuing attempt to build 'collegiality' in the best sense: a thousand staff who understood the University's situation and the options available to it and could discuss with one another how best to achieve commonly shared goals. Very little structural change occurred until 1999, when the University changed quickly and without fuss from a six-faculty to a three-division structure. A stable senior management group, a talented body of staff and a strong sense of community were all ingredients that helped to produce good outcomes in what were undeniably stressful times.

Much of the stress was externally generated. One element was frequent change in Ministers and their priorities. John Dawkins gave more attention to technical training when the Labor Government was returned to office in 1990, and became Treasurer in 1991. Higher education became the responsibility of Peter Baldwin, one of the junior Ministers. Baldwin was a good student and had the sense to learn some music before he waved the baton. His major achievement, 'the Quality rounds', had universities scurrying in many directions trying to show how concerned they were for 'quality' in order to achieve high standing and a share of some new money. In 1991 Dawkins was followed by Kim Beazley, who seemed to regard higher education as a great comedown from Defence, where he had served with distinction as Minister for several years. Beazley in turn was replaced by Simon Crean, whose principal contribution, at the end of the Labor Government's term, was first to push universities into an era of 'enterprise bargaining' with the unions, and second to fail to provide them the funds needed to provide overdue salary increases. His Liberal successor, Amanda Vanstone, had the unpleasant task of explaining to universities that they were to lose 6 per cent of their recurrent funding in order to help to fill an alleged budgetary black hole left by the Labor Government. David Kemp, who replaced Senator Vanstone in 1998, was more interested in school education than in the university domain, in which he had spent several years as a professor at Monash University. His attitudes and actions emphasised even further the dictum of the 1990s that universities were on their own, and should not see the Commonwealth Government as a source of new funding. The Commonwealth, for fifty years the main provider for Australia's universities, as well as the main regulator, was plainly retiring from its first role, and even to a degree its second.

The increasing indifference of governments to the universities presented a problem to the Australian Vice-Chancellors' Committee that it could not solve. By and large governments had treated universities generously and respectfully in the post-war period. John Dawkins' interventions, notwithstanding the fact that they were accompanied with substantial new funding, were seen as rude and ignorant. Academic critics of government seemed unable to grasp the point that when most people who make decisions have been educated at university, universities will, for perfectly good reasons, have lost a good deal of their former mystique and authority. Very few undergraduates adopt the view that research is the main reason for the existence of universities, especially when they cannot find a teacher when they need one because that person is undertaking his or her 'real work'. Moreover, the tendency of some academics, especially in the older universities, to speak in ways that indicated not only that they had a high opinion of themselves but they expected the community to share that warm feeling, tended to reduce the general esteem in which universities and their inhabitants were held within an increasingly well-educated Australia. Cabinet discussions about higher education in the 1990s, on both sides of politics, appear not to have been attended with much respect or sympathy for the problems the vice-chancellors were facing.

The over-riding problem for the Australian Vice-Chancellors' Committee was, however, that it did not identify or could not agree on a common cause. It would have to be said that some vice-chancellors, by forming smaller groups within the Australian Vice-Chancellors' Committee and putting that group's interests first, or by telephoning Ministers to distance themselves from a Committee decision, did little to assist any cause other than their own. A long-term sustained attempt to build a base within the Australian community, probably the only strategy that had

much chance, foundered on time-scale: it might be seven years before there was a result to show for all the effort and expenditure, and by that time most vice-chancellors would have been replaced. It is also probably true that Australian Vice-Chancellors' Committee leaders had difficulty in separating themselves from the notion that if only they had an opportunity, they could persuade the Minister to do this or that. One vice-chancellor of the period took the view that he would only speak to the Minister; senior public servants were underlings, and he had his own to correspond with them. Alas, governments of both sides knew that despite the size and importance of higher education, vice-chancellors had no more capacity to mobilise public opinion, let alone votes, than to operate without money.

The combination of enterprise agreements that were obtained only after distressing industrial action, unfunded salary increases and a progressive decline in Commonwealth financial provision made the mid 1990s a very difficult time for all universities. Technological changes provided a new challenge, just at a time when money was scarce. Everyone was working harder in 1995 than had been the case ten years earlier, and by 2002 the pace of work had risen again. It was as though Australia was unable to extricate itself from a treadmill of its own making.

At the end of the decade there appeared the demographic spectre. For fifty years Australia's universities had relied first on the results of a rising post-war birthrate and then on increases in participation as the fuel of growth. By 2001 two demographic elements were plain. First, about half the school-leaving cohort would now attend university, and getting the other half there was going to be problematic. In consequence, the group who had missed out on university because of their school results, the 'mature-age' group, would decline. Second, the Australian birthrate was low and getting lower. By about 2010 there might be more university places available than there were students wishing to take them up. It was not hard to imagine thrifty officers in the Department of Finance looking forward to the day when the Commonwealth could actually reduce funding to the universities because of lack of demand. In retrospect, the early decision that the University of Canberra should concentrate on what it was good at and not try to be all things to all people was a providential one.

And what of students, the universities' true reason for being? The last decade of the 20th century was not a radical time. There was fuss aplenty, but student anger was directed at fees, costs and funding, which was perfectly understandable given what had happened to them over the decade. Not only did they have a Higher Education Contribution Scheme debt to worry about, but publicly provided financial assistance for needy students dwindled. Much higher proportions of students found that they simply had to have a part-time job, in order to survive and also 'to maintain a lifestyle', meaning a motor vehicle (public transport also became less generally useful in the decade), money for entertainment, clothes and non-university activities. They were joined in the search for available and compatible work by scores of thousands of overseas students, who needed the money to pay for fees and accommodation. The university as an institution was losing its place as the social setting for the life of its students.

Nonetheless, the quality of the students as people preparing to enter professional life made me, at least, confident about the future. Today's young people are better rounded, more widely knowledgeable, more articulate and probably more hard-working than my own generation was at the same time. They are being educated in universities which, though less well funded than they ought to be, are more interested in education and more pre-occupied with how to provide it at high levels of quality, than was the case in the 1980s. It is true that some of our students can't spell, and the apostrophe has become a random punctuation mark for many, but they take their work seriously, and they care about the world. The quality of our graduates tells me that the universities are doing pretty well, despite their problems. Before very long a new generation of academic staff will be running things, a generation not nurtured on stories of a golden age when things were good, students were well prepared, research money was easy to get, academics were very well paid and governments knew their place. My guess is that they will make a pretty good fist of it.