Developing a Framework for a Useable and Useful Inventory of Computer-facilitated Learning and Support Materials in Australian Universities

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Evaluations and Investigations Programme
Higher Education Division

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## Abbreviations and acronyms

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Description</th>
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<tbody>
<tr>
<td>AARNet</td>
<td>Australian Academic Research Network</td>
</tr>
<tr>
<td>ADU</td>
<td>academic development unit</td>
</tr>
<tr>
<td>ANTA</td>
<td>Australian National Training Authority</td>
</tr>
<tr>
<td>ASCILITE</td>
<td>Australasian Society for Computers in Learning in Tertiary Education</td>
</tr>
<tr>
<td>ATN</td>
<td>Australian Technology Network (Queensland University of Technology, University of Technology Sydney, RMIT University, University of South Australia, Curtin University of Technology)</td>
</tr>
<tr>
<td>AVCC</td>
<td>Australian Vice-Chancellors Committee</td>
</tr>
<tr>
<td>CFL</td>
<td>computer-facilitated learning</td>
</tr>
<tr>
<td>CTI</td>
<td>Computers in Teaching Initiative</td>
</tr>
<tr>
<td>DETYA</td>
<td>Department of Education, Training and Youth Affairs</td>
</tr>
<tr>
<td>EdNA</td>
<td>Education Network Australia</td>
</tr>
<tr>
<td>HTML</td>
<td>Hyper Text Markup Language</td>
</tr>
<tr>
<td>IMM</td>
<td>interactive multimedia</td>
</tr>
<tr>
<td>IMS</td>
<td>Educom/ CAUSE Instructional Management System</td>
</tr>
<tr>
<td>IP</td>
<td>intellectual property</td>
</tr>
<tr>
<td>IT</td>
<td>information technology</td>
</tr>
<tr>
<td>ITS</td>
<td>Information Technology Services</td>
</tr>
<tr>
<td>TAFE</td>
<td>Technical And Further Education</td>
</tr>
<tr>
<td>URL</td>
<td>Universal Resource Locator</td>
</tr>
<tr>
<td>VET</td>
<td>Vocational and Educational Training</td>
</tr>
</tbody>
</table>

### Universities that responded to the online survey

- Bond University
- Curtin University of Technology
- Deakin University
- Edith Cowan University
- Flinders University
- Griffith University
- James Cook University
- Macquarie University
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<table>
<thead>
<tr>
<th>Acronym</th>
<th>University Name</th>
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<tbody>
<tr>
<td>MOC</td>
<td>Marcus Oldham College</td>
</tr>
<tr>
<td>Monash</td>
<td>Monash University</td>
</tr>
<tr>
<td>Murdoch</td>
<td>Murdoch University</td>
</tr>
<tr>
<td>NTU</td>
<td>Northern Territory University</td>
</tr>
<tr>
<td>QUT</td>
<td>Queensland University of Technology</td>
</tr>
<tr>
<td>RMIT</td>
<td>RMIT University</td>
</tr>
<tr>
<td>SCU</td>
<td>Southern Cross University</td>
</tr>
<tr>
<td>SC</td>
<td>Sunshine Coast</td>
</tr>
<tr>
<td>UniBall</td>
<td>University of Ballarat</td>
</tr>
<tr>
<td>UniMelb</td>
<td>University of Melbourne</td>
</tr>
<tr>
<td>UNE</td>
<td>University New England</td>
</tr>
<tr>
<td>UTS</td>
<td>University of Technology Sydney</td>
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<tr>
<td>Newcastle</td>
<td>Newcastle University</td>
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<tr>
<td>UQ</td>
<td>University of Queensland</td>
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<tr>
<td>UniSA</td>
<td>University of South Australia</td>
</tr>
<tr>
<td>USQ</td>
<td>University Southern Queensland</td>
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<tr>
<td>UTas</td>
<td>University of Tasmania</td>
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<tr>
<td>UWA</td>
<td>University Western Australia</td>
</tr>
<tr>
<td>Woll</td>
<td>University of Wollongong</td>
</tr>
<tr>
<td>VU</td>
<td>Victoria University</td>
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Executive summary

Focus of the report

There are two aspects to this report—general issues related to the adoption of computer-facilitated learning (CFL) resources, and specific issues relating to setting up a useful and usable inventory of CFL resources.

The project team began the project with the idea that we could develop a prototype national inventory using ‘snapshots’ obtained from institutional surveys, case studies and literature work. However, sufficient data about existing CFL resources is simply not yet available. The emphasis in this report evolved into the development of a framework about how a successful national inventory could be set up and maintained. As we outline later, we are recommending a system of distributed databases ‘held together’ by metadata standards.

The report relates to key themes which emerged from the five case studies conducted in this study. These themes are Policy, Culture and Support. We have woven these themes into the report because we have been convinced that Australian university teachers will look for and use existing CFL resources only when these policy, culture and support issues are addressed. Otherwise any national inventory system will be used only minimally (and then only by enthusiasts rather than those who might benefit most).

Background

Universities in Australia are currently in an environment of intense change. They are being required to educate more students, from an increasing variety of backgrounds, with decreasing government funding. Universities are required to compete vigorously for student enrolments and external sources of funding. In this environment, universities have had to reassess their fundamental business and the way they go about it. Information Technology (IT) is viewed as an important factor in streamlining their operations.

There has been a great deal of development of electronic educational resources in the last few years. This has occurred together with substantial development of IT systems and infrastructure in all Australian universities. However, there is little evidence of dissemination of these electronic resources
and practices. Greater collaboration and sharing of resources is becoming an increasingly urgent issue. There are several existing databases of CFL materials, but these databases do not appear to have significantly increased the take-up of CFL materials and strategies. In order to make the most of the valuable resources which exist, a range of educational, technological and management factors needs to be addressed.

The term computer-facilitated learning (CFL) materials is used to describe materials which use information technology in some way to facilitate teaching and learning, including: educational CD-Roms; online course content materials; and the use of software for computer-mediated communication within a course.

**Methods used**

The study used a multi-method approach, employing online surveys of institutional practice (28 Australian universities responded); a literature survey; and a case study of five universities at project, faculty and institutional levels. The data included survey results, interview transcripts, focus group transcripts, institutional documentation and short descriptions or vignettes.

The study explored issues which facilitated or mitigated against teachers being able to work in an environment which facilitates the adoption of CFL, in terms of:

- appropriate policies, infrastructure and supports within the institution;
- access to information about CFL resources; and
- being able to work collaboratively both within and across institutions.

**What information exists about CFL resources at Australian universities**

A substantial amount of data was accumulated from a range of sources about the resources which exist to support CFL at Australian universities. It is clear that many universities are actively engaged in producing CFL resources to enhance the educational offerings they have. There is also a clear commitment to developing appropriate infrastructure to support the use of technology. The diversity in universities’ structural arrangements made it difficult to compare data across institutions. There is also a variation in the stage of adoption of new IT by universities. Precise information about CFL resources may not have been obtained from some universities because the
survey was not responded to by the person with most accurate knowledge, or because facilities were devolved and centralised data was not available. The rapid change in the area also means that information provided to the investigators may be soon out of date. Overall the information about existing CFL resources at Australian universities is patchy and incomplete. In particular, there is limited or no information across the sector in general about:

- the educational design of the CFL resources being produced;
- the incentives and support that exist for individuals to produce CFL resources;
- the technical design and access specifications for using these CFL resources;
- the experience of using the CFL resources in actual teaching contexts;
- evaluations carried out to determine how educationally effective these resources have been in practice;
- intellectual property and copyright issues which might affect the use by others; and
- how access can be obtained to these CFL resources from either colleagues in the same university or another institution.

**What major issues emerged relating to adoption of CFL at Australian universities?**

Three major themes emerged from the case study relating to adoption of CFL at Australian universities. These were Policy, Culture and Support. The considerable overlap between and within these themes is illustrated in figure 1. These major issues were selected from the case studies using three criteria:

- frequency of being mentioned;
- intensity of expression in the interview; and
- who articulated the idea, e.g. senior administration and/or teachers and support staff.

The Policy theme looked at specific institutional policies, such as equity and intellectual property, the alignment of policy throughout the organisation, the direction of policy change (bottom-up or top-down) and a number of strategic processes which flowed on from policies such as grant schemes.

Culture incorporated factors such as collaboration within institutions, and personal motivation of staff to use CFL, as well as particular aspects of
funding, staff rewards and time, leadership, teaching and learning models, and attitudes such as ‘not invented here’.

Support incorporated a whole gamut of institutional issues including IT, library and administrative infrastructure, professional development for staff, student support, educational and instructional design support for academic staff, funding and grant schemes, and IT literacy.

Several universal factors in relation to widespread use of CFL were identified:

- coherence of policy across all levels of institutional operations and specific policies which impact on CFL within each institution;
- intellectual property, particularly the role of copyright in emerging online environments;
- leadership and institutional culture;
- staff issues and attitudes: namely, professional development and training, staff recognition and rewards, and motivation for individuals to use CFL; and
- specific resourcing issues related to funding for maintenance or updating of CFL materials and approaches, staff time release and support staff.

Figure 1: Themes and their relationships affecting the adoption of CFL

The tension between collaboration and competition is important. We argue that collaboration can assist healthy competition in higher education, but at present it seems there are few within institutions who are comfortable with or aware of this position.
What key features are needed in a national inventory of CFL resources?

Dissemination of information about CFL resources, and the location of CFL resources via databases are fundamental parts of this study. A framework for the development of a national inventory system is proposed whereby the development of national metadata standards will enable teachers and lecturers to search across a distributed set of interest-group-based databases. A number of features were identified which could characterise a well-designed teaching and learning database. The database should:

- have a distributed nature;
- be maintained in an ongoing sense;
- be owned by academics and professional staff;
- contain contextual information about the resource, including a full description of the product; the rationale behind its development; its unique characteristics; the pedagogical approach used; intellectual property details, and how it might be obtained; and evaluation data;
- contain a range of experiential information on how the resource was used in a real-life teaching context, both by the developer and others; and
- return the appropriate level of information to the queries submitted by users.

A key factor was the access to information:

- The data submission and retrieval process should be straightforward.
- Resources should be submitted by people with expertise in CFL and knowledge of the discipline, following a scholarly review process.
- Resource submission should not be by the developer of the resource.
- Resources successfully submitted to the database should attract scholarly recognition.

The size of the Australian education sector does not allow the continual re-invention of the wheel. A collaborative approach is needed towards the development of national metadata standards and web-based search strategies. Only through this synergy will competitive use be able to be made of CFL resources developed at great expense within the sector.
Major recommendations of this report

This study found that the issues surrounding the adoption of CFL at university are complex, and no single factor will result in adoption. Instead, there is a range of factors, all of which must be addressed.

| Policy | Universities need to have a clearly articulated vision of the changes to teaching and learning that technology brings.  
• This vision should have ownership and commitment from all levels of management.  
• The Dean or Head of Department/ School should lead and support moves into CFL.  
• Vision needs to be supported by policy and institutional culture.  
• There needs to be a mixture of top-down and bottom-up policy direction.  
• Equity of access to IT for all students needs to be considered, e.g. by safety-net policies. |
|---|---|
| Institutional culture | For CFL adoption to become widespread, staff must be rewarded, whether tangibly or intangibly, for their efforts. Motivation is an essential driver to innovation.  
• Appropriate criteria for teaching performance need to be developed in order to provide an effective incentive for academic staff to adopt CFL materials and practices. These should apply to promotion and selection processes.  
• Schemes to recognise and reward technical staff, e.g. through qualification routes, are needed in order to retain expertise. |
| Infrastructure and support | Adoption of CFL needs to be underpinned by funding mechanisms, infrastructure, staff development and technical support.  
• All of these are expensive. Funding mechanisms for the sector need to provide incentives to universities to manage these costs.  
• Funding schemes need to monitor the progress of initiatives and learn from earlier experiences. Adequate reporting should be built into funding mechanisms.  
• Project-based funding is not necessarily effective once the early adopter phase has been reached. More comprehensive models are needed.  
• Professional development and training is a complex and multi-faceted area. There is a need for high quality staff developers, for flexible support programs, for using mentors, and allowing adequate time for staff to engage in staff development. Incentives should be given to universities to show demonstrable support services. |
## Intellectual Property

Intellectual property (IP) issues, and copyright in particular, are of crucial importance, specifically in terms of:
- dissemination of information about IP
- access to practical support on IP and licensing issues
- recognising the rightful owner of copyright materials, whether in monetary terms or in kind.
- Universities should have a public IP policy and report on its implementation.

## Collaboration

There is a synergy between collaboration and competition. Collaboration can assist healthy competition in higher education because the efficient use of resources can allow institutions to develop their own specialities more effectively.
- Mechanisms which support collaboration, e.g. inter-institutional grant schemes, should be favoured.

## Databases

Databases of CFL resources are potentially important mechanisms for supporting adoption, once several issues are addressed:
- Databases need to be well-designed and maintained.
- Database owners need to collaborate on the development of metadata standards so that an expanded market for collaboration and competition is created.
- The development of a unified, Australia-wide collaborative framework for interoperable online databases depends on policy support from DETYA.
- Intellectual property issues associated with the emergent use of metadata and metadata standards need to be researched at a national level.
1 Introduction and key issues

1.1 Setting the scene

All universities in Australia at present are engaged in a rapid process of change, where terms like ‘niche market’ and ‘productivity’ jostle alongside concerns about ‘generic graduate attributes’ and ‘professional competence’. Quantity and quality are both important considerations in the universities of the 21st century as they seek to maintain important intellectual and physical spaces for their staff to pursue creative research and development, while at the same time needing to provide teaching for escalating numbers of students in all courses in order to shore up funding. These student cohorts have become increasingly diverse (McInnis, James & McNaught 1995) with more part-time students, and students from a greater variety of backgrounds.

Flexible modes of delivery have been widely viewed as the prime way of meeting the challenges posed by this diversity. There has been a fair amount of naive equating of flexible delivery with production of online materials (‘plug them into the web’) and insufficient attention to the relationship between flexible modes of operation for students, the use of communication and information technologies and the design of educationally sound learning environments (Kennedy & McNaught 1997; Reeves & Reeves 1997). This is true of all levels in the system. There is pressure on universities to become more ‘efficient’, often to the exclusion of educational effectiveness, and this has translated in too many cases to the placing of text-based materials on the web and a reduction in face-to-face teaching. However, there is no doubt that communication and information technologies will be a major part of future university planning, as several recent reports make clear (e.g. Yetton et al. 1997; McCann, Christmass, Nicholson & Stuparich 1998).

There has been a great deal of development of electronic educational resources in the last few years. This has occurred together with substantial development of IT systems and infrastructure in all Australian universities. However, the evidence is that there is little dissemination of these electronic resources and practices. Greater collaboration and sharing of resources is becoming an increasingly urgent issue. There are several existing databases of computer-facilitated learning (CFL) materials but these databases do not appear to have increased the take-up of CFL materials and strategies a great deal. It is clear that we need to investigate educational, technological and
management issues in designing ways in which more value can be obtained from the expensive resources that exist.

A key issue for this study is that there is a low take-up of CFL in universities in ways which maximise efficiencies and effectiveness. In recent years, innovation in higher education involving the use of communication and information technologies has proceeded through the framing of projects, devised by enthusiastic individuals, often working in isolation from their colleagues. Funding is for short-term products and evaluation limited to the requirements of a project report produced in a relatively short time frame. Alexander, McKenzie and Geissinger (1998) reviewed 104 of the 173 information technology projects which received funding from the Committee for the Advancement of University Teaching (CAUT) in 1994 or 1995. Their major recommendation is that information technology projects need to be developed in a more scholarly and professional manner. This echoes the recommendations of Hayden and Speedy (1995) who evaluated the 1993 CAUT grants and voiced concern that there were few projects where there were clearly described evaluation techniques and actual measurement of outcomes.

This isolated development of CFL resources is compounded by the lack of any systematic procedure by which comprehensive and authenticated information about CFL materials can be obtained. Conference proceedings are often the best way to find out about CFL innovations in Australia, but only recently have a significant number of these become openly available on the web, and even then, proceedings are not normally associated with search engines; searching is usually done by title of the paper, and the paper is usually a self-reporting process that is not externally validated. Some disciplinary initiatives exist which attempt to bring rigour into the reporting of information on CFL resources; for example, Nunes Vaz (1998) suggests a model of peer reviewing of CFL resources, based on practice in the field of marine biology.

New models are emerging about global initiatives in education. For example, Cunningham (1998) has developed a model of ‘borderless education’ which shows the interplay between the ‘5Ps’ of practical issues, pedagogical issues, policy issues, philosophical issues and personal issues. Information has become the ‘glue’ which holds global initiatives together. Indeed, Davies (1999) describes information as a possible unifying metaphor for understanding nature and consciousness. Access to accurate, useful information about existing CFL resources and strategies is the key to developing the best global and local education offerings for Australian students. This is a key focus of this report.
1.2 Purpose and scope of this study

The project team began the project with the idea that we could develop a prototype national inventory using ‘snapshots’ obtained from a range of data sources. However, insufficient data about CFL resources is available. The emphasis in this report evolved into the development of a framework about how a successful national inventory could be set up and maintained. As we outline later, we are recommending a system of distributed databases ‘held together’ by metadata standards.

The project team investigated the extent of use of computer-facilitated learning (CFL) materials across the higher education sector. The framework for an updated national inventory of such materials was developed in the context of developing a strategy which could lead to a greater adoption of CFL materials in Australian higher education. This project will assist a range of bodies—universities, DETYA, government, AVCC—in an analysis of the strengths and weaknesses of the higher education sector’s use of CFL materials.

For the purposes of the project, computer-facilitated learning (CFL) materials covers a wide range of uses of computing technology in teaching and learning. CFL materials include:

- stand-alone resources, such as educational CD-Roms, either produced in-house or obtained from elsewhere;
- online course information and support material;
- online course content material;
- the use of software for computer-mediated communication within a course;
- the use of a suite of distributed learning environment tools (either an integrated commercial product such as WebCT or TopClass, or a set of tools developed in-house) within a course;
- materials produced by students as part of their course of study;
- databases (e.g. of visual or case study materials) used in courses; and
- assessment resources, etc.

For the purposes of the project, a computer support system includes:

- network and hardware facilities;
- IT help desk support for staff and students;
- a system for student management, including web-based student enrolments;
- university library services; and
- IT literacy courses, etc.
This project builds on other recent EIP studies about the use of educational technology in higher education. Back in 1996, Hesketh, Gosper, Andrews and Sabaz (1996) studied the use of computer-mediated communication in university teaching. They noted, at that time, that information technology applications had not penetrated university teaching at more than a superficial level. They had a sense that ‘universities are waiting for information technology to infiltrate their teaching; there is a degree of passivity expecting that the inevitable will happen’ (p. xv). In this study we look at the 1999 level of investment in and use of communication and information technologies. We also study the barriers to the uptake of these new technologies, to gain a clear picture of what needs to now be done to assist universities in becoming more pro-active.

Taylor, Lopez and Quadrelli (1996) carried out case studies at Griffith University and the Queensland University of Technology of academics’ views about flexible modes of delivery. They found an increasing support for flexible modes of delivery from educational and professional perspectives. However, they noted that issues of work load, few opportunities for collaboration and a lack of focus on educational benefits in the use of technology need to be addressed. This study focuses especially on ways to foster collaboration and sharing of resources.

As noted above, Yetton et al. (1997) make it clear that communication and information technologies will be a major part of future university planning. His research team examined 20 universities’ management of IT. They noted that an organisation’s performance is a function of fit among five factors: strategy, roles and skills, management processes, structure and technology. They noted the need to change terms and conditions of employment in universities and the need for rationalisation. ‘There will be winners and losers' (p. xiii). In this study we aim to suggest ways in which universities’ internal policy development and their approaches to collaborative ventures might maximise their chances of being ‘winners’.

Fraser and Deane (1998) investigated the use of open learning strategies in the development of life-long learning competencies in undergraduate science students. They interviewed 36 staff (a mixture of National Teaching Development Grant recipients and distance education staff) and gave questionnaires to 50 students at Charles Sturt University and Monash University. The National Teaching Development Grant recipients used a greater diversity of teaching strategies and elicited higher student satisfaction. Fraser and Deane identified both peer and institutional support as critical factors in the successful implementation of effective open learning strategies; they advocate more support (including academic staff development) for a range of flexible teaching/learning strategies and more evaluation of
educational effectiveness of subjects and courses. In this study the model of
the interdependence of policy, culture and support extends the
recommendations made by Fraser and Deane.

Cunningham, Tapsall, Ryan, Stedman, Bagdon & Flew (1998) emphasise the
need for a global perspective. They argue that Australian universities may face
competition from international well-resourced media corporations with a good
understanding of client markets. The final recommendation is that strategic
alliances within the higher education sector and between the sector and
communication networks are needed in order to coordinate the development
and evaluation of computer-based materials, and to develop databases of such
material. The model of a national inventory as a collection of distributed
databases, proposed in this study, provides a strategy to enact this
recommendation of Cunningham et al.

1.3 Outcomes of this project

There are three aspects of this report:

1. An analysis of data that currently exists on the nature of CFL materials and
   computer support systems in the higher education sector.

2. An exploration of issues which facilitate or mitigate against teachers being
   able to work in an environment which facilitates the adoption of CFL, in
   terms of:
   • appropriate policies, infrastructure and supports within the institution;
   • access to information about CFL resources; and
   • being able to work collaboratively both within and across institutions.

3. An investigation into suitable requirements in a model for a national
   inventory system. The report also highlights ways in which a national
   inventory system might be made accessible to the higher education sector.

In chapter 2, the research methods used will be outlined. Chapter 3 focuses
on what resources exist to support CFL at Australian universities and how
difficult it is to find out precise information about CFL resources. In chapter 4
we examine the five case studies used in this project and describe the themes
that have emerged. These themes are institutional policy (chapter 5), culture
(chapter 6), and institutional support (chapter 7). In chapter 8 we focus on
how collaborative work can foster a greater adoption of CFL. It will be argued
that staff will use technology in their teaching when culture, policy and
support structures are congruent. In chapter 9 we return to the mechanism by
which better information about CFL materials and practices may be made
available to university staff; a national system of distributed databases will be
described. The report thus proposes that a national inventory system is important for the Australian higher education sector, but also highlights the fact that unless the environment in which Australian university teachers work supports the adoption and use of CFL, there will be little use made of any national inventory of CFL resources.
2 Research methods used

2.1 Overview

The project team are members of the Australasian Society for Computers in Learning in Tertiary Education (ASCILITE). ASCILITE is a professional organisation which has membership across the Australasian higher education sector. The members have a substantial collective experience about the design and use of CFL in universities. This experience was utilised in each of the research methods used. The network of ASCILITE members, especially the 72 campus representatives, was used to facilitate the collection of data.

The study used a multi-method approach (Brewer & Hunter 1989) employing both quantitative and qualitative methods: online surveys, a literature survey, case studies and a series of vignettes. The project objectives informed the process of identifying topics and issues which were used as the basis for devising the questions used in the surveys and in the case study.

The data, collected from multiple sources including surveys, interviews, focus groups, institutional documentation and short descriptions or vignettes, enabled the project team to clarify potential inconsistencies in the information and validate the converging lines of inquiry. The documentation provided included reports, policies, regulations, background papers and statistics which directly related to or offered contextual information about the computer-facilitated learning (CFL) projects or initiatives studied.

Participant verification also proved to be an important phase of this study as some of the findings revealed potentially contentious issues related to the widespread adoption of CFL approaches across the sector. The process of clarification and resolution of these issues was a useful aspect of the research process, revealing further insights into the complexities of some of these issues and also adding weight to the significance of the overall findings.

Analysis was carried out on each set of data sources (e.g. surveys and case studies) and circulated for comment among the project team and other project stakeholders. The final analysis phase combined data from all sources using a refined themes framework, which included the addition of additional sub-themes.
2.2 Online surveys

Two surveys were conducted—an institutional survey of Australian universities and an individual survey of ASCILITE members. The purpose of the surveys was to gain quantitative data about the structures, policies and resources of Australian universities which might impact on the extent of use and dissemination of CFL within the institution and across the higher education sector. In addition, in order to explore more fully the issues and trends which the project team had identified at the outset of the study, qualitative data was collected about the perceived efficacy of some of these measures from an institutional and individual perspective, and examples of innovation and good practice were also sought.

2.2.1 Survey of Australian universities

A comprehensive survey was developed to seek information about institutional policy and expertise in computer-facilitated learning and support materials (Appendix D.1). In particular, the survey sought to identify any cross-institutional collaborations, determine the use of online information for student administration and record systems, and the use of library and other information databases. The survey consisted of four sections (Table 2.1).

Table 2.1 Focuses of the Institutional Online Survey

<table>
<thead>
<tr>
<th>Section of the university</th>
<th>Central administration</th>
<th>Information technology services</th>
<th>University library</th>
<th>Academic development unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Focus of the section survey</td>
<td>To learn about: • how universities are developing policy to support CFL, especially online learning; • the process of establishing priorities; and • the nature of university investments in CFL</td>
<td>To learn about how universities are developing IT infrastructure systems to support teaching and learning, in particular which technologies are being used and supported.</td>
<td>To learn about how university libraries are assisting staff to search and retrieve CFL resources to use in or support the courses they teach.</td>
<td>To learn about how university academic development units support university staff in activities relating to the use of technology in teaching and learning.</td>
</tr>
</tbody>
</table>

The development of the survey was a consultative process involving the project team, the Advisory Committee, CAUL (Committee of Australian University Librarians) and CAUDIT (Committee of Australian University Directors of Information Technology). Several drafts were produced and the penultimate draft was given to a focus group, consisting of eight university...
teachers with varying degrees of experience in the use of technology in teaching. Further comment was sought from this group.

All Australian higher education institutions were invited to participate, with project team members and ASCILITE members coordinating the process on a regional basis. Each institution was given the URL for the online survey, but the sections were designed to be completed separately by the most appropriate university organisational unit or area.

There were responses from 28 universities to the survey; 18 answered all sections and the remaining 10 provided partial responses. The universities who responded covered all types of Australian universities. Table 2.2 provides numbers who answered each section.

Table 2.2 Response Numbers to the Institutional Online Survey

<table>
<thead>
<tr>
<th>Section of the university</th>
<th>Central administration</th>
<th>Information technology services</th>
<th>University library</th>
<th>Academic development unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of replies</td>
<td>25</td>
<td>25</td>
<td>24</td>
<td>25</td>
</tr>
</tbody>
</table>

2.2.2 Survey of ASCILITE members

A short online survey (Appendix D.2) was developed to assess individuals’ perspective on:

- the effectiveness of a range of staff support activities and programs related to the use of CFL, and
- the degree of adoption of CFL resources within individuals’ own institutions.

There were 73 responses to this survey, from participants at 24 universities.

2.3 Case studies

A multiple case study design was adopted to allow an in-depth exploration of the issues identified at the outset of the project. Semi-structured interviews and focus group sessions enabled identification and examination of additional unforeseen issues by the project team.

Five universities, one from each of the mainland Australian states, were selected as the ‘host’ environment for the five cases investigated. (Originally six universities were approached, but the sixth was later unable to
The selection of host environments was based on the following organisational characteristics:

- age;
- location (urban, regional);
- size;
- number of campuses (single or multi-site campus);
- affiliations with other universities (e.g. ATN network);
- amalgamated (university status acquired at, or about, the time of amalgamation with other tertiary institutes, colleges, etc.); and
- strategic orientation (e.g. distance education, offshore focus, research, industry or professional links, vocational emphasis).

The five cases can be described as:

- three faculty-based examples (medicine, law, medical science). These were at universities described as Established University, Multi-campus University of Technology, and Single-campus University of Technology.
- one ‘project’-based example (projects chosen from different schools within the university but with common themes—innovation, collaboration, offshore online initiatives). This was at a university described as Urban Distance Education University.
- one ‘institutional’-based example (university-wide online initiative). This was at a university described as Regional Distance Education University.

The selection of these cases was based on the type of CFL activities and the access the project team was given to the relevant stakeholders within the timeframe parameters set by the overall study.

Prior to carrying out the interviews and focus groups, ‘stakeholder’ categories were devised which would represent the diverse range of experience and views of those involved in the use of CFL approaches. The aim was to collect opinions from all those who might influence the degree of adoption or take-up of CFL within the higher education sector, rather than just the views of innovators or those in positions of formal authority. This process drew on the well-established body of literature (Rogers 1995) but adapted Rogers’ ‘adopter’ classification to the particular needs of this study. The two key dimensions were the attitude towards (or degree of adoption of) a new technology, and the nature or degree of influence an individual might possess in relation to its widespread use. These are illustrated in table 2.3.
Table 2.3  Case study stakeholder categories

<table>
<thead>
<tr>
<th>Nature of authority</th>
<th>Case stakeholders</th>
<th>Degree of adoption</th>
</tr>
</thead>
</table>
| Formal authority    | • Pro-Vice-Chancellors  
                     • Deans, Registrars  
                     • Heads of School or Units, Project Directors (or other senior positions which oversee the use and development of CFL) | Innovators and early adopters |
| Informal influence  | • Mentors and well respected members of academic staff  
                     • Disenfranchised staff  
                     • Professional support staff with specialist expertise  
                     • External providers/consultants | Innovators and early adopters  
Mainstream and later adopters  
Resistors |

Individuals who participated included senior academic and administrative staff, managers, academic staff (representing all three ‘adoption’ categories shown in table 2.3), librarians, technical and administrative staff, educational developers and staff with professional expertise in instructional and graphic design, evaluation consultants, computer programmers, outside providers and other consultants. The stakeholders associated with each case thus represented a broad range of university staff and individuals associated with the use of CFL within universities. Eighty-one participants were involved in this phase of data collection (table 2.4).

It was not possible to incorporate all stakeholders and issues within a single case; indeed, each case represented a unique example. However, the validity and reliability of the data collected was maintained through the appropriateness of the selection process. The cases, taken together, provide a comprehensive and balanced coverage of the essential issues. The details of each case are indicated in table 2.4.

One case was conducted as a pilot and, based on the feedback and preliminary examination of these findings, minor modifications were made to the methodology of the remaining cases.
## Table 2.4 Summary of the five case study institutions

<table>
<thead>
<tr>
<th></th>
<th>Established university</th>
<th>Multi-campus university of technology</th>
<th>Regional distance education university</th>
<th>Urban distance education university</th>
<th>Single-campus university of education</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>&gt;50 years</td>
<td>5–10 years</td>
<td>&gt;10 years</td>
<td>&lt;10 years</td>
<td>&gt;10 years</td>
</tr>
<tr>
<td>Location (primary)</td>
<td>City</td>
<td>City</td>
<td>Regional</td>
<td>City</td>
<td>Suburban</td>
</tr>
<tr>
<td>Size</td>
<td>&lt;25,000 EFTSUs</td>
<td>&lt;25,000 EFTSUs</td>
<td>&lt;25,000 EFTSUs</td>
<td>&lt;25,000 EFTSUs</td>
<td>~25,000 EFTSUs</td>
</tr>
<tr>
<td>No. campuses (primarily)</td>
<td>single</td>
<td>multi</td>
<td>multi</td>
<td>multi</td>
<td>single</td>
</tr>
<tr>
<td>Affiliations</td>
<td>Group of eight</td>
<td>ATN*</td>
<td>Distance education ATN*</td>
<td>ATN*</td>
<td>ATN*</td>
</tr>
<tr>
<td>Amalgamated</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Orientation</td>
<td>• Established</td>
<td>• University of Technology</td>
<td>• bIT Focus to support learning at a distance (high percentage DE enrolments)</td>
<td>• University of Technology</td>
<td>• University of Technology</td>
</tr>
<tr>
<td></td>
<td>• Research excellence</td>
<td>• Strong local/state professional &amp; industry links</td>
<td>• Strategic use of IT, e.g. to serve offshore and entrepreneurial initiatives.</td>
<td>• Offshore</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Teaching excellence—IT used to value-add on-campus</td>
<td>• Teaching excellence—IT used to value-add on-campus</td>
<td>• Teaching excellence—IT used to value-add on-campus</td>
<td>• Teaching excellence—IT used to value-add on-campus</td>
<td>• Teaching excellence—IT used to value-add on-campus</td>
</tr>
<tr>
<td>Case definition</td>
<td>Faculty-based</td>
<td>Faculty-based</td>
<td>Institutional-based</td>
<td>Project-based</td>
<td>Faculty-based</td>
</tr>
<tr>
<td>CFL activities</td>
<td>Strength in development and use of IMMA programs</td>
<td>Eclectic use of CFL, including online and computer-based approaches</td>
<td>Institutional standardised online approach -volume delivery</td>
<td>Standardised online approach as well as specific innovative and collaborative offshore online initiatives</td>
<td>Innovative computer-based learning programs</td>
</tr>
<tr>
<td>Number of interviewees</td>
<td>17</td>
<td>24</td>
<td>19</td>
<td>14</td>
<td>7</td>
</tr>
<tr>
<td>Number of sessions</td>
<td>17</td>
<td>17</td>
<td>13</td>
<td>12</td>
<td>2</td>
</tr>
</tbody>
</table>

*ATN—Australian Technology Network*

Analysis of data collected from all the cases was done in several stages. Transcriptions were done for the majority of interviews and focus group sessions, while the remaining interviews (five in total) were summarised using the key issues as criteria. This raw data was collated into a ‘first pass’ case by case summary of the issues, including the quotations which remained anonymous. The second pass edited this data and made an initial analysis of the issues, making limited reference to documentation provided by each institution. A version of the second pass summary (without quotations) was
sent to all participants for verification and comment. Quotations were forwarded separately to individual participants for permission to include them in the report. This process is represented in figure 2.1.

Figure 2.1 Stages in the analysis of the case study data

2.4 Literature survey

A search was made of Australian literature where examples of useful practice could be found. Conference proceedings of conferences where technology in teaching and learning is a key theme were the main focus. The search involved looking for two types of article.

1. Those which link to the issues identified in the study, for example:
   - policy and leadership;
   - intellectual property;
   - databases which provide the right sort of information; and
   - professional development.

2. Any projects which seem to have:
   - a long life;
   - were disseminated locally (same institution, same city); and/or
   - been commercially developed.

It was difficult to get full details of useful ideas and projects from the literature and this experience partly determined our suggested strategies about the use of databases in disseminating information about CFL resources outlined in chapter 9.
2.5 Vignettes

A series of vignettes or mini-cases was solicited from individuals to highlight important aspects or themes of the study. In some cases, individuals were approached or interviewed but the majority were submitted after an invitation was extended to all ASCILITE members. A total of 18 vignettes revealed a number of examples of good practice, particularly with respect to dissemination and widespread adoption of CFL approaches.

The research process is summarised in Figure 2.2. The emergence of the themes is discussed in chapter 4.

Figure 2.2 Research process
2.6 One final comment

This was a collaborative project between Australian universities and a professional association (ASCILITE) which has a network of members across most Australian universities. We have sought to gain data at institutional level, faculty/department level and from individual academics. It is our belief that complex issues need to be viewed from several perspectives, and that more extensive and efficient use of CFL resources will require policy changes at all levels of the higher education system.
3 Resources to support computer-facilitated learning at Australian universities

In this chapter information about how Australian universities are developing physical and support infrastructure mechanisms to support the use of CFL in their courses will be presented. Much of this information was obtained from the national online survey (Chapter 2, p. 8). Information about the extent of online teaching and learning activity is also included.

The project team began the project with the idea that we could develop a prototype national inventory using ‘snapshots’ obtained from institutional surveys, case studies and literature work. But sufficient data about existing CFL resources is simply not yet available and, in this chapter, we explore some issues surrounding the description of actual CFL resources used in courses at Australian universities.

3.1 University level planning for resource provision

3.1.1 Diversity in structural arrangements

The diversity in universities’ structural arrangements in the higher education sector is well known. The survey asked questions about two aspects of relevance to the provision of an appropriate technology infrastructure: whether there are formal links to Technical And Further Education (TAFE) institutions and whether the university is a multi-campus institution.

Of the 25 universities who submitted a Central Administration questionnaire, seven had formal links to TAFE and considered themselves bi-sectoral universities; 17 had essentially no links with TAFE and there was one ‘no reply’. In many universities new relationships are growing, e.g. Victoria University stated that they had no formal mechanism, but had growing informal collaborations.

Eighteen universities were multi-campus universities and seven had most of their locus of activity on one campus. Complex network processes are needed to provide for multi-campus systems. Some examples which illustrate the range of network provisions are:
The University of Ballarat has links with TAFE which results in it being a multi-campus institution. It has had a TAFE Division since amalgamation in January 1998 with two TAFE institutes. The current link with the School of Mines and Industries Ballarat campus is ISDN, and there are AARNet links to the Western Campuses (Ararat, Horsham, Stawell). Microwave links are being installed in 1999. All web-based university and course information is shared.

Deakin has a combination of microwave links between campuses, and a shared link with Monash University and CSIRO into the VRN network which is linked into AARNet. A variety of units in Bachelor of Commerce, Masters of Commerce, MBA program, Bachelor of Law, Bachelor of Science, Bachelor of Applied Science, Bachelor of Arts use a mixture of CFL materials in teaching across campuses.

At the University of Queensland, there is a microwave link to Ipswich from St Lucia of 155 MHz, and also a land link to Gatton of 35 MHz but the university will be extending the microwave link shortly to Gatton from Ipswich. Most hospital campuses are linked through a land line or small microwave link. These are not uniform yet. Already a considerable number of Ipswich courses are being offered through to the main St Lucia Campus. The graduate Medical course is available through all hospitals via a central system. The university’s main campus is linked via a central backbone.

PARNet is the Perth Academic Regional Network, Western Australia. It is the physical network of the West Australian Regional Network Organisation (WARNO) of the Australian Academic Research Network (AARNet). It consists of five organisations: The University of Western Australia, Curtin University of Technology, Edith Cowan University, Murdoch University and the CSIRO. PARNet physically consists of an E3 ATM Microwave Radio Network linking the above institutions from a central location situated in the BankWest Tower in the business district of Perth. The link to other institutions within AARNet, domestic Australian networks and the Internet is through the private AARNet network, an OC3 link provided by Optus Traffic. Accounting on this link is accomplished by using Cisco NetFlow enabled on the OC3 interface. The data created by NetFlow is collected by a process running on meter.parnet.edu.au. (a DEC AlphaStation 200/166). This data is then immediately processed to produce statistics on throughput and also to produce individual Internet Protocol accounting figures for each institution.
3.1.2 Investment in institutional support for online learning

Most universities now recognise that the use of CFL resources and systems is of strategic importance and that this means that administrative processes and systems need to change. Universities were asked to comment on the investments they were making to provide for online learning. The overall results are shown in Figure 3.1. With the exception of ‘arranging leases for student computers’ and ‘brokering Internet access for students with private providers’, most universities are investing in providing online learning. Examples of three universities are given in Table 3.1; these illustrate the wide diversity in decisions about provision of systems at institutional level. These are very fluid snapshots, with the situation changing rapidly in many universities.

Table 3.1 University investments to provide for online learning at three Australian higher education institutions

<table>
<thead>
<tr>
<th></th>
<th>Deakin University</th>
<th>RMIT University</th>
<th>Marcus Oldham College</th>
</tr>
</thead>
<tbody>
<tr>
<td>ExtDLS</td>
<td>yes</td>
<td>yes</td>
<td>no</td>
</tr>
<tr>
<td>IntDLS</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
</tr>
<tr>
<td>NetSys</td>
<td>yes</td>
<td>yes</td>
<td>no</td>
</tr>
<tr>
<td>StudLab</td>
<td>no</td>
<td>yes</td>
<td>no</td>
</tr>
<tr>
<td>StudLease</td>
<td>no</td>
<td>yes</td>
<td>no</td>
</tr>
<tr>
<td>Intranet</td>
<td>yes</td>
<td>yes</td>
<td>no</td>
</tr>
<tr>
<td>Internet</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
</tr>
<tr>
<td>ISP</td>
<td>no</td>
<td>yes</td>
<td>no</td>
</tr>
<tr>
<td>Finance</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
</tr>
</tbody>
</table>
Figure 3.1 University investments to provide for online learning (Q 1.1.1–Q 1.1.10)

Key:
- ExtDLS: Obtaining software site licences for online distributed learning systems
- IntDLS: Building or planning to build your own online distributed learning system (this might include commercial components)
- NetSys: New network systems
- StudLab: New student computer labs
- StudLease: Arranging leases for student computers
- Intranet: Providing access to a local university network for students
- Internet: Providing Internet access for students
- ISP: Brokering Internet access for students with private providers
- Finance: Providing financial support to faculties for the development of online courseware

A few examples of how universities have organised access to distributed learning systems are:

Griffith University has developed the concept of a learning centre to support on-campus flexible learning. Learning centres incorporate student workstations as well as groupwork areas, seminar rooms, etc. The University’s new Logan Campus, which began operation in 1998, has three learning centres with a total of 167 workstations. The learning centre model is being implemented on other campuses, e.g. an area on the Gold Coast was refurbished for 1999, with 90 workstations.

The University of Ballarat has a Distributed Learning Network. This is a distributed and devolved network of learning centres to strengthen cross-
sectoral provision and training, to enable isolated rural communities to access education, information and networks, and to utilise emerging technologies for the benefit of the communities. The university is involved in a Victorian Government initiative for regional development—University of Ballarat Online Learning Platform Regional Connectivity Project.

At Bond University, students are provided with network access from the rooms in residences, from the university libraries and from general access laboratories across campus.

At James Cook University, videoconferencing facilities have been provided for two lecture/tutorial facilities. These facilities use TELSTRA OnRamp services. Online lectures/tutorials are available for some subjects using HTML formatting but at present there is no single consolidated entry point for students wishing to partake in CFL type courses. The University has an IP policy for all materials. The current policy is under review by the Intellectual Property Committee, and the new draft policy now makes explicit reference to CFL materials.

A variety of software is used in the distributed learning systems used in Australian universities. Many use proprietary integrated online distributed learning systems where one product is used to provide access to information, learning activities, assessment tasks such as quizzes, and communication such as email, asynchronous threaded discussions and synchronous chat. Of the proprietary online distributed learning systems, WebCT seems to the most popular. It was mentioned by 10 universities in this survey; as at April 1999 WebCT is being used at the following Australian universities, TAFE institutes and large projects, though the extent of the use within universities varies from being the major online learning system (e.g. Murdoch) to very few users (e.g. RMIT University).
The growth in use of systems like WebCT is high as shown by the figures for Curtin University of Technology in Figure 3.2.
Other proprietary systems mentioned in the survey are FirstClass, Lotus Learning Space, TopClass, and LearnLink.

Many universities are developing hybrid systems in several ways, for example:

- enhancing commercial tools with additional functionality; Macquarie University has added substantial additional facilities to WebCT (chapter 7, p. 118); and
- linking proprietary systems to in-house learning management tools: e.g. this is happening at the University of Melbourne.

USQConnect is USQ’s online information system. However, it is also used to assist computer-facilitated learning. For example, it includes the ability for students to call up study materials and study online. Other systems include USQFocus, and new commercially-based initiatives such as INDELTAs TrainingNET and the eEducation platform.

The University of Queensland is using WebCT for their base software. They had already developed an online assessment tool called ‘Brainzone’ (Strassburger 1997) and will continue to develop it with the final version planned for commercial distribution. UQ currently has 10 000 students using the assessment program. This plugs into WebCT and other online products.
There is a belief that real efficiencies could be possible with supportive infrastructure and good planning. Many universities are now focussing on an overall systems approach across the university. At this time, however, all universities are in transition, and are grappling with the issues in designing and managing new ways of working.

RMIT University established a project team in 1998 to develop an Information Technology Strategy designed to facilitate the implementation of the objectives of the Teaching and Learning Strategy, in respect of electronically mediated flexible learning environments. The Information Technology Alignment Project (ITAP) report, delivered by the team in June 1998 and adopted by the University, forms the basis for a $50 million investment by RMIT over the next three years.

The report comprises four elements:

- IT infrastructure aligned with the needs of education to deliver the systems and hardware necessary to provide students with an electronically connected learning environment and access to computer-based learning resources;
- a Distributed Learning System (DLS) compliant with the emerging Educom/ CAUSE Instructional Management System (IMS);
- a Student Management System (SMS), fully integrated with the DLS to provide enrolment and subject and course progress records electronically accessible to academics and students; and
- extensive staff development.

A new financial management system is also in operation. The ITAP report has allowed the University to properly articulate its objectives with respect to the use of IT in teaching and learning by identifying that IT will be used to enrich the learning environment by augmenting traditional methods rather than displacing them. The emphasis is on interactivity, time/space independence and flexibility. The position adopted by RMIT recognises that the delivery of content by ‘electronic photocopying’ and sophisticated multimedia is not the primary objective. RMIT is mandating corporate standards compliant with the IMS to mitigate the risk inherent in such a large investment.

Most universities are developing their capacity to deliver online course material in order to support both on-campus and off-campus students (figure 3.3). This means that sharp distinctions between totally on-campus and distance mode are disappearing; many universities are seeing that online technologies can enable them to use the same course materials to support student learning totally on- or off-campus or as a mixture of both modes.
So, ‘online’ can mean a total course online, developed as a totally independent learning package, but it is more common for ‘online’ to refer to some subjects, or parts thereof, being online and other parts being delivered in face-to-face settings. Of course, the use of print materials and other media are still a part of higher education delivery systems. In essence, this has become a central aspect of the term ‘flexible learning’.

There is a strong push in many institutions for developing offshore teaching as a strategic initiative, though institutions are still unclear how best to integrate online technologies with a presence in the offshore location. At all institutions, the changes to administrative and institutional support systems are complex and take time. This can result in a mismatch between academic needs for responsive changes in teaching systems and slow change at institutional level. Responsiveness is a key issue. The situation can even be more complex when many of the courses are offshore. These issues are explored further in chapter 5, Policy.

Figure 3.3 Focus of delivery for online courses: (only on-campus, 6 universities; only off-campus, 4 universities; both, 15 universities) (Q 1.12)

From the data above, it is clear that almost all universities are investing in two major directions:
- the development of better IT network system; and
- financial support for the development of online courseware.

3.1.2.1 The development of better IT network systems

The development, use and sharing of CFL resources (including online courseware) is the main concern of this report, though it is obvious that investments in physical networks and laboratories are an integral part of using more technology in teaching and learning. This investment includes network facilities, computer labs, space, furniture, and also the level of staff computers. Huge investments are needed in most universities, but the options being considered vary enormously. Examples are:
RMIT is investing $5.7 million over the next three years in computer purchases alone.

At James Cook University lease arrangements are being considered for introduction on the Cairns campus and possibly the whole University in conjunction with the opening of the new Library/IT building at the beginning of 2000.

The University of Queensland had an arrangement in the first year of the Graduate Medical course for one year where lap-top computers were compulsory. That was unsatisfactory and now computer specifications are provided and provision of computers is left to the students.

Question 2.5 of the survey asks for a current snapshot of universities’ capacity for online delivery in terms of workstations capable of accessing a university network. Several universities noted that they were unsure of the quality of some computer labs at faculty and school/department level. The data was incomplete and, on checking, was found to be inaccurate at several institutions. Precise information about numbers of computers may not have been obtained from some universities because the survey was not responded to by the person with most accurate knowledge, or because facilities were devolved and centralised data was not available. The rapid change in the area also means that information provided to the investigators may be soon out of date. It is therefore not summarised here. For example, RMIT University, as part of its Y2K audit, counted 6449 student computers; this is much higher than figures reported by many similar-sized universities in the survey. Also this type of data is changing rapidly; RMIT is leasing 2500 new student computers, many of which will replace existing machines. The difficulty in estimating student access computers is not surprising as responsibility for student computer laboratories is shared between many areas at most universities—faculties, Information Technology Services (ITS) units and libraries are the key agents. Many universities are currently undertaking significant technology audits.

Ownership of computers by students is also a rapidly changing situation. A survey of 4553 first year students at RMIT University at the beginning of 1999, across both TAFE and higher education sectors, indicated that 92 per cent of the students had their own computer, 84 per cent had their own printer, 79 per cent had a CD-Rom drive and 52 per cent had Internet access. There was no significant differences between TAFE and higher education students. These numbers were significantly higher than those obtained in previous surveys.
With respect to dial-up access (question 2.7 of the survey), both modem use and brokering of Internet Service Provider (ISP) agreements (OzeMail being the most frequently mentioned) are used. Examples are:

Edith Cowan University has its own modem pool and manages it internally. There are two discrete modem pools, one for the exclusive use of staff and the other students, although post-graduate students may use the staff modem pool also. The University has in the past negotiated with ISPs for the provision of modem pool and internet access, but decided to make these services free to students at the time. The matter is expected to be reviewed again in 1999.

The University of Tasmania has outsourced to a preferred ISP for two years. Modem supply increases in line with demand. Removal of restriction is planned when ‘authentication’ issues are solved.

3.1.2.2 Financial support for the development of online courseware

The issues of funding are complex. Substantial investment in systems change has been noted above. Funding for content to put in the systems, and for educational designers who assist staff in designing online learning environments, is another matter. As figure 3.1 shows, most universities provide financial support to faculties for the development of online courseware. The amounts vary enormously, as do the mechanisms by which funds are administered. Amounts reported in the survey range from a few hundred thousand to several million dollars per annum of university funding. Mechanisms range across:

- funding totally devolved to faculties;
- small strategic fund at the centre with most funding at faculty level; and
- central grants as the chief source of funding.

As Figure 3.4 shows, most universities provide funding in terms of grants and facilities by both central and devolved mechanisms.
In reality, the picture at each university is complex, as this description from the University of Queensland shows:

Funding for courseware development at the University of Queensland is happening in several ways.

- The UQ Ipswich campus has been established as a flexible delivery campus, so all learning resources for the 11 courses (across five faculties) are developed from a specific pool of money. This pays for academic staff salaries, as well as the salaries and costs associated with the development of the resources. These include all subjects with an online component, but it is not necessarily the case that the full subject will be delivered online.
- The Vice-Chancellor has a strategic fund where bids can be made for various initiatives. Some of this funding has been allocated to develop online courses.
- Funding has been provided from Open Learning Australia (OLA) for online development and UQ is a shareholder in this. Three courses have been developed under this arrangement.
- A number of faculties have made a commitment to develop online courses and have initiated their own program of development, funded from their own resources, e.g. the Natural Resources, Agriculture and Veterinary Science faculty has made a significant financial commitment to this.
- Other faculties, other than those involved in the Ipswich developments, are doing this on a smaller scale.
Coordinated projects are also useful and valuable in order to achieve a range of CFL offerings for students to use, as this description from Deakin shows:

In August 1997 the university announced a suite of coordinated projects that together will enable it to achieve the further development of the university’s technologically-mediated flexible learning system. The major projects are as follows:

A. The Comprehensive Online Research and Development project (CORD). This consists of a series of projects to develop integrated online solutions to the teaching and learning needs of one or more courses offered by a School or Schools. Examples include the Warehouse Project in the School of Psychology, the development of an MA online in the Social Studies of Science, the development of a range of integrated approaches in the School of Human Movement and the development of a Biology Warehouse to serve the needs of several Schools in the Faculties of Science and Technology and Health and Behavioural Sciences.

B. The Online Teaching and Learning Enhancement Project. This is aimed at assisting the university to provide flexible, student-centred and highly interactive learning experiences for all students. The project is specifically concerned with the use of a wide range of affordable, high-volume and easily achievable online technologies such as computer conferencing.

C. The Video-teaching Project. This is aimed at developing within the university the capability of allowing students on any campus of the university to participate in learning experiences originating on any campus of the university.

D. The Deakin Toolkit Project. This aims to provide a CD-Rom-based interface that will allow individuals located off campus to take full advantage of the services available on the Deakin system and the Internet.

This section has provided descriptions of how Australian universities are investing in developing the infrastructure and courseware to support online learning. Funding is also discussed in chapter 5, Policy, and chapter 7, Support. In chapter 5 a number of key issues surrounding funding are discussed, including the need for funding policies to cover monitoring and evaluation, and to provide for ongoing maintenance of CFL developments. In chapter 7 the question of whether funding should be through central or faculty-based processes is explored.
3.1.3 Current use of institutional systems

Of course, the systems that are being put in place can be used in a variety of ways. Figure 3.5 illustrates the features of online teaching and learning that are commonly used at Australian universities. These features are used by both on- and off-campus students. Of course there is also significant variation between departments at the same university. The variation between universities is shown in figure 3.6 (each horizontal set of bars represents the features used at one university); at this stage only two universities report using the full range of the listed technologies. It is likely that this snapshot of how online technologies are being used will change markedly in the next few years with increasing use of the web for communication and formal assessment.

Of course, the development of high quality online courses is not just determined by access to particular technologies; Paulsen (1998) examines several factors including system environment constraints and opportunities; learners and their experience; course content; design of online learning resources; the functions and experience of online teachers; and teaching methods, techniques and devices. Putting course information and lecture notes on the web can be a pedagogically useful thing to do. But if one want to provide a substantive amount of a subject or course via the web, one needs to do much more.

Designing resources and providing a support and communications infrastructure to enable students to tackle authentic problem-solving tasks requires more than building flat web pages. Exercises designed to allow students to interact with and manipulate data and exchange ideas on the process with the teacher and peer students are needed. Designing these exercises in a web environment requires new skills for many teachers. Alexander et al. (1998) provide a composite profile of a successful information technology project in terms of improving student learning. Their list of 19 points covers the need for pedagogical design skills, planning and team skills, assessment and evaluation skills, and an institutional milieu which is supportive of the work.
Figure 3.5 Features of online teaching and learning at Australian universities (Q 1.13)

Key:
- CourInfo: Course information
- ContInfo: Provision of content information
- IntLearn: Interactive learning experiences
- Quiz: Informal quizzes
- FormAss: Formal assessment tasks
- Thread: Use of threaded discussions
- SynChat: Use of synchronous chat
- OzWeb: Links to Australian web sites
- IntWeb: Links to international web sites
Figure 3.6 Variation between universities in the use of features of online teaching and learning (each horizontal set of bars represents the features used at one university).

In this section, the variety and variation in the use of features of online teaching and learning has been described. The data is composite data across each university. At present, most universities have online courseware which provides information, including links to other sites. The majority have interactive learning experiences informal quizzes and threaded discussions. The use of the web for formal assessment and synchronous chat is much lower.

3.1.3.1 Staff use of software

Data obtained from Information Technology Services units provide insight into another issue relating to staff using computer-facilitated learning strategies. Figure 3.7 illustrates software support available to staff and their usage thereof. Figure 3.8 shows the same data for students. Note that while the respondent universities were all able to provide data about university infrastructure software support, many did not comment on staff and student usage. It is clear that staff do not use the full range of technologies available to them. There are complex issues relating to culture, staff development, adequate provision of facilities at a local level, etc. that relate to the fact that the majority of Australian academics use their computers for email; web
browsing and maybe basic web teaching; and Office applications like Word, PowerPoint and Excel. Also, it may be that some technologies will not be considered appropriate by the majority of staff and will not be used widely. For the purposes of this section, it is heartening to note that many universities have set in place useful infrastructure for software support. In chapter 8, it will be argued that staff will use technology in their teaching when culture, policy and support structures are congruent.

3.1.3.2 Student use of software

A similar pattern exists for student use; there is greater capacity than is being used. However, access issues and computer maintenance issues are involved here; for example, having a licence for a particular piece of software does not ensure that all student machines have it installed on them or are of a standard to use it.
Figure 3.7  Software support available to staff and their usage thereof

University infrastructure software support for staff (Q 2.1)

Usage of technologies by staff (Q 2.2.1)

Key: email, web, telnet, ftp, synchronous chat, desktop videoconferencing, studio videoconferencing, streaming audio, streaming video, dial-up access, general office applications—see Glossary
Figure 3.8  Software support available to students and their usage thereof

University infrastructure software support for students (Q 2.1)

Usage of technologies by students (Q 2.3.1)
3.2 Changing roles of information technology services staff

Some data about provision and uptake of services provided by Information Technology Services (ITS) units to their institutions have been given above. It is interesting to note the variation in priority given through resource allocation to issues like equity and access for all students, staff access, student access, training, reliability, leading edge innovation and system integration. This is shown in figure 3.9. The data in the survey was in a five-point scale from very important (5) through to not important (1); the data has been collapsed into two categories—important (4&5) and limited importance (1–3) in order to see trends more clearly. While most issues are considered very important or important, there is a considerable variation across universities (Table 3.2).

Figure 3.9 Priorities for resource allocation for ITS units (Q 2.4)
At RMIT University there are standards for networking Novell Directory Services (NDS) authentication for every user. There is a major revamp of existing student access laboratories, replacing them with learning resource centres. Almost $2m is being spent in 1999 on increasing PC availability, etc. Implementation of leasing schemes to ensure state of the art equipment is occurring. There is university support for an ISP (OzeMail) to allow students to obtain cheaper services.

At the University of Melbourne, all staff have access to email and the WWW. Funds are allocated for infrastructure to ensure all students can have central email accounts. Central machines which support core services, such as the mail gateway and the University proxy cache, are clustered to provide maximum availability. Training: during 1998 over 2000 staff training sessions (1 session > a half day) were delivered for some form of IT or system-related (e.g. finance system) training for staff. Start-of-year training sessions are held for new students to provide introduction to IT facilities and use on campus.

At Monash University technology rooms for disabled students are located in the Library. Computer work stations with web access have voice synthesisers, braille keyboard, web readers, voice dictating and scanners. A training manual is being developed for webmasters to ensure web pages are accessible to disabled students.

Training staff who can maintain and use the complex systems that universities are currently developing is a major issue. Training programs must encompass

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<table>
<thead>
<tr>
<th>Table 3.2 Priorities for resource allocation for ITS units</th>
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<tbody>
<tr>
<td></td>
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<td></td>
</tr>
<tr>
<td>Equity and access to all students</td>
</tr>
<tr>
<td>Staff access</td>
</tr>
<tr>
<td>Student access</td>
</tr>
<tr>
<td>Training</td>
</tr>
<tr>
<td>Reliability</td>
</tr>
<tr>
<td>Leading edge innovation</td>
</tr>
<tr>
<td>System integration</td>
</tr>
</tbody>
</table>
the training of IT staff to maintain these systems, and the training of academic and administrative staff who will use these systems. Training needs are escalating and may well become a critical issue in the near future. Already outsourcing of training is occurring in the majority of institutions (figure 3.10); it will be interesting to see how universities respond to this challenge in the next few years.

Figure 3.10 Number of universities who outsource training (Q 2.6)

There is no doubt that the demands on ITS units are increasing, often with limited increases in resources. Figure 3.11 shows that many universities are developing new systems where the expertise of ITS staff will be needed.

Figure 3.11 New systems and processes at Australian universities (Q 2.8–2.12)

Key:
- Leasing: Arrangement for leasing computers to students
- Enrolment: Web-based enrolment of students
- Assessment: Students obtaining official assessment results via the web
- Smart card: Planning to introduce a smart card system for students
There is also an increasing role for ITS staff in the support of online learning systems. IT support staff have expertise; academic staff have educational ideas. These need to connect well together. Issues of culture, ownership, and effective project management that is inclusive, not exclusive, need to be considered. There is often a problem when IT staff and academic staff do not understand the needs and understandings of each other.

The increase in the complexity of ITS staff roles relates to an additional concern in several universities about keeping skilled technical staff in the university. This is difficult as salaries are higher outside the higher education sector. As the IT systems become more complex and university business comes to rely even more heavily on ITS units and their staff, this could become a crucial issue.

Queensland University of Technology is starting a low cost leasing scheme for students in association with Toshiba and Equicol. A range of laptop machines are available in a lease-to-buy or rental scheme, with possibility of upgrade after 2 years. The cost is ~$20 to ~$25 per week. At the University of South Australia, leasing is under consideration. The University of Tasmania does not consider leasing to be core business.

Edith Cowan University was one of the first universities to design and develop a web-enabled enrolment and lecture and tutorial selection system which is used exclusively for enrolment from local and remote sites. Part of the enrolment system is web-based at the University of Melbourne and being expanded to other functions; returning students can do their course planning and re-enrolment through a web-based interface.

At Southern Cross University there is currently an agreement which must be signed that confidentiality will be adhered to. Two levels of permissions are granted to specific staff members—read only and read/write permissions. Both permissions on the system are password-protected. A new project is underway which will incorporate implicit security protocols.

### 3.3 Diverse functions of university libraries

In many universities the Library plays a pivotal role in providing access to information and in providing professional development for staff and students. Library services now use IT intensively for searching for information sources and increasingly to provide online catalogues.
3.3.1 Information literacy development

It is clear that libraries have a major role in supporting the development of general information literacy skills for staff (Figure 3.12) and students (Figure 3.13) and provide a variety of services in this regard.

Figure 3.12 Methods used by libraries to support the development of information literacy skills for staff (Q 3.2)

![Bar chart showing methods used by libraries to support the development of information literacy skills for staff.]

Key:
- Induction: Formal induction sessions
- InfoDoc: Information (in document)
- InfoOnline: Information (online)
- SupportStaff: Support staff available

Figure 3.13 Methods used by libraries to support the development of information literacy skills for students (Q 3.3)

![Bar chart showing methods used by libraries to support the development of information literacy skills for students.]

Key:
- Induction: Formal induction sessions
- InfoDoc: Information (in document)
- InfoOnline: Information (online)
- SupportStaff: Support staff available
Library staff also play a key role in technological literacy programs which are described on pp 45–46. As this example from the University of Wollongong shows, there is often a strong connection between the provision of information literacy and technological literacy programs.

Catherine Milne manages the Information Literacies project at the University of Wollongong. The University of Wollongong has a stated list of graduate attributes expected of its graduating students since 1992. One of the attributes of Wollongong graduates was that they be information and computer literate in simple terms.

A survey was done in 1997 and it was found that about 30 per cent of students never activated their computer accounts at the University of Wollongong. That means that there was a 70 per cent connectivity, which most universities would think was reasonable. But the university wanted everybody to connect themselves—or as many as possible. The program was designed to introduce the students to the information environment available in the university, which included the Library and the Information Technology Services area.

The Information Literacies Introductory Program required students to do three basic things. They had to activate their computer account; they had to complete an information literacies skills session in the Library (either as part of a library workshop or they could do a self-paced alternative); and they had to submit an assignment that was given to the students during the library program, on the web.

A program like this cannot run and can’t operate if people don’t collaborate. Initially, the team consisted of Catherine as the Tertiary Literacies Coordinator for the university, plus people from Information Technology Services and from the Library. There were also representatives from the Centre for Educational Development and Interactive Resources (CEDIR), who were heavily involved, for example, in the development of a video, ‘Getting connected’.

3.3.2 Development and maintenance of catalogues

There are enormous challenges as libraries convert their catalogues to a web-based format. At present, the majority use a partially web-based (accessed through a World Wide Web browser such as Netscape or Internet Explorer), partially telnet-based format (accessed through software which links a desktop computer to a remote, in this case a Library, server) (figure 3.14). Web technology is easier to use and provides a more functional interface.
The majority of universities provide support for online searching for information about computer-facilitated learning (CFL) materials by staff for use in teaching (rather than research or grant applications); in this survey 19 universities provide this service through one or more of the mechanisms listed in figure 3.15; four do not, and there was one non-response.

However, few libraries maintain a catalogue of CFL resource materials, in either electronic or paper-based form. In this survey, six universities have a catalogue of CFL resources; 16 do not, and there were two non-responses. Few libraries particularly recommend any web-based catalogues for CFL materials to staff, such as the UniServe clearinghouses. Only six universities recommend such web-based catalogues; 17 do not, and there was one non-response.

None of the respondent libraries provides any specific financial resources for the acquisition of CFL materials. Requests for purchase are dealt with under the normal acquisitions budgets.
3.3.3 Collaborative projects involving university staff

Many libraries have staff involved in the production of CFL materials in collaborative projects with academic staff at the University. So, internal collaborative ventures are common. However, there is little sharing of resources between universities in this area. The University of Queensland mentioned unresolved issues of copyright and licensing in this regard. This data is illustrated in figure 3.16. This may be because there are low holdings of CFL materials in most universities at this time. There is active collaboration between universities on library functions such as cataloguing, e.g. Williamson (1997) describes the Western Australian Academic Libraries Collaborative Cataloguing Project.

Figure 3.16 Internal and external collaborative ventures of libraries (Q 3.12–3.14)

At RMIT University Library there are collaborative projects with academics include developing and hosting material for various subjects, e.g. VET (Vocational and Educational Training) subject modules, midwifery subjects in higher education. Also, developing information literacy materials for particular contexts, e.g. how to use ERIC, making a Fashion Toolkit. The Library is also developing professional development programs with web-based delivery elements; and developing support materials for IT literacy, e.g. the IT literacy CD-Rom, Entree. The Library also has provision of facilities for piloting and delivering CFL.

The key role of university libraries in information literacy development has been noted in this section. Libraries provide key support in online searching for resources but few maintain any catalogues of CFL resources. While internal collaborative projects between library staff and academic colleagues...
are common, there is little external collaboration at this stage to acquire or share CFL resources.

One of the difficulties with the research in this report is that contexts and priorities are changing rapidly. A recent paper presented to the Committee of Australian University Librarians is proposing collaborative work between universities (called the eSPACE project) to look at authentication issues for electronic resources in order to provide access to the collections and resources of libraries and document delivery services from the personal computers of staff and students <http://www.lib.monash.edu.au/elim/espace.htm>. There is no doubt that more collaborative work will occur in the future.

### 3.4 Support for developing and using CFL materials given by academic development units

Much of the support work related to developing and using CFL materials is done by or in conjunction with academic development units (ADUs). While the names of these units vary, they are usually centrally-based groups of staff with expertise in education design, curriculum design and teaching strategies.

![Figure 3.17 Existence of ADU teaching and learning plans](Q 4.2)

Most ADUs have an existing or draft Teaching and Learning Plan, but it is less frequently aligned with an IT plan (Figure 3.17).

**Figure 3.17** Existence of ADU teaching and learning plans (Q 4.2)

**Key:**
- Strategic: Is it aligned with a University Strategic Plan?
- IT Plan: Is it aligned with an IT Plan?
- FlexLearn: Is there a section in the Teaching and Learning Plan related to flexible learning?
- Technology: Is there any mention of flexible learning related to technology?
3.4.1 Size and structure of ADUs

Clearly the size and structure of ADUs vary enormously. There are a few universities who do not have an ADU but these have equivalent staff in other organisational units. ADU size ranges from zero staff to over 100 staff. In most institutions, about half the staff work primarily supporting technology in teaching and learning.

Table 3.3 Staffing of Australian academic development units early in 1999

<table>
<thead>
<tr>
<th>Name</th>
<th>No. of staff in the ADU</th>
<th>No. of staff primarily supporting technology in teaching and learning</th>
</tr>
</thead>
<tbody>
<tr>
<td>CUT</td>
<td>Approximately 55</td>
<td>Approximately 18–20</td>
</tr>
<tr>
<td>Deakin</td>
<td>110</td>
<td>110</td>
</tr>
<tr>
<td>ECU</td>
<td>2 and 2 halves</td>
<td>1</td>
</tr>
<tr>
<td>Griffith</td>
<td>33</td>
<td>12</td>
</tr>
<tr>
<td>JCU</td>
<td>149 in Academic Support Division</td>
<td>Approx. 50 in IT in T&amp;L support</td>
</tr>
<tr>
<td>Macquarie</td>
<td>Centre for Flexible Learning 29; Centre for Professional Development 10</td>
<td>10</td>
</tr>
<tr>
<td>MOC</td>
<td>10</td>
<td>1</td>
</tr>
<tr>
<td>Monash</td>
<td>12</td>
<td>4</td>
</tr>
<tr>
<td>Murdoch</td>
<td>25</td>
<td>9</td>
</tr>
<tr>
<td>NTU</td>
<td>No academic development unit. Teaching &amp; Learning Office 2; Interactive Learning Division 15</td>
<td>4 / 2</td>
</tr>
<tr>
<td>QUT</td>
<td>100</td>
<td>55</td>
</tr>
<tr>
<td>RMIT</td>
<td>20</td>
<td>10</td>
</tr>
<tr>
<td>SCU</td>
<td>12</td>
<td>0</td>
</tr>
<tr>
<td>SC</td>
<td>No formal unit</td>
<td>Most staff currently located in IT Services —approximately 8 staff. Also, one position, the Instructional Technologies Coordinator.</td>
</tr>
<tr>
<td>UniBall</td>
<td>12</td>
<td>None—and all. It is embedded in effective teaching and learning strategies.</td>
</tr>
<tr>
<td>UniMelb</td>
<td>About 50 (including academic and non-academic)</td>
<td>About 12 in the Unit. About 100 [in the University as a whole]</td>
</tr>
<tr>
<td>UNE</td>
<td>16</td>
<td>5</td>
</tr>
<tr>
<td>Newcastle</td>
<td>22</td>
<td>2</td>
</tr>
<tr>
<td>UQ</td>
<td>45</td>
<td>29 with admin support and academic curriculum development support from academic advisors, etc.</td>
</tr>
<tr>
<td>UniSA</td>
<td>90 (EFT)</td>
<td>12</td>
</tr>
<tr>
<td>USQ</td>
<td>No single ‘unit’ exists. IT training occurs through: Organisational Development &amp; Training Unit (Human Resources)—2 staff &amp; contracts. Library—2 training staff. Information Technology Services—3 staff</td>
<td>ITS—15 staff. Dist. Ed. Centre—15 staff. NETLEAD staff—3 staff</td>
</tr>
<tr>
<td>UTas</td>
<td>zero, we don’t have a unit</td>
<td>zero</td>
</tr>
<tr>
<td>UWA</td>
<td>9</td>
<td>0.5</td>
</tr>
<tr>
<td>Woll</td>
<td>30</td>
<td>30</td>
</tr>
<tr>
<td>VU</td>
<td>20</td>
<td>1</td>
</tr>
</tbody>
</table>
Over half the ADUs have a specific budget from internal university funds for supporting technology in teaching and learning; in this survey 16 ADUs were in this position; six had no special technology funds and there were three non-responses. However, the amounts vary enormously from a few thousand to several million; some of these budgets include equipment and infrastructure as well as project money for courseware development and funds for staff time release.

As the University of New England comments:

*Funds are dispersed across a range of initiatives and cost centres, making it difficult to quantify. The University’s Infrastructure Development Plan identifies particular initiatives related to teaching and learning, but not all costs in the Plan could be classified as such. Total commitment in the Plan for 1999 is about $3M. There are also funds in the Learning and Development Program, with staff specifically funded in this role, as are operating funds of the Information and Education Services Division.*

### 3.4.2 ADU activities relating to technology in teaching and learning

The activities occurring in ADUs relating to technology in teaching and learning and their relative perceived importance are illustrated in figure 3.18.

Ellis, O’Reilly and Debreceny (1998) reported on an online survey of 20 ADUs (48 per cent response rate with a follow-up phone survey conducted of non-respondents) about staff development activities for technology in teaching and learning undertaken during 1997 and those planned for 1998. Results show that most training is still delivered by traditional methods such as classroom presentations, demonstrations and half-day tutorials while online methods of delivering training are less frequently used. The content of training courses covers a broad range of topics with the most popular being pedagogical issues in online course design, web page design, and course authoring systems. Staff undertaking training tended to be from a cross-section of academic levels. Staff development activities of this nature are not exclusively provided by the ADU but tend to be carried out by a range of internal and external providers.

Even activities not rated as major activities by the ADUs are still worked on seriously in many universities. The data in figure 3.18 relates to ADU activities but, in reality, staff development occurs through many agencies—ADUs, ITS units, other central technology (e.g. multimedia) units, libraries, faculty-based teaching and learning units, faculty-based technology units, informal department/ school activities, etc. The ADUs often play a key role in
establishing and maintaining relationships between these units and the coordination of their activities is essential to the development of coherent and comprehensive staff development programs.

Figure 3.18 ADU perceived importance of their technology in teaching and learning activities (Q 4.6)

Key:
- UniW’shop: General workshops across the university
- FacW’shop: Faculty/department workshops
- SoftTrain: Software training sessions
- ITLitStaff: IT literacy support for staff
- ITLitStud: IT literacy support for students
- EdDesignCourse: Educational design of entire courses
- EdDesignUnit: Educational design of units
- Consult: Individual consultations
- EvalCFL: Evaluation of computer-facilitated learning (CFL) innovations
- CFLresource: Providing information about CFL resources
- CFLinven: Maintaining an inventory of CFL projects in the university
- Assess: Support for computer-based assessment systems
- Online: Support for online learning system
- Grants: Facilitation of grant writing for CFL development
- Visitors: Visiting specialists, teachers, scholars
3.4.2.1 Technological literacy

One example is technological literacy. This includes the skills, conceptual understandings and dispositions which enable students and staff to use technology effectively for academic, research and vocational purposes. Figures 3.19 and 3.20 show programs relating to technological literacy for staff and students. These are run by a variety of units in the universities. Libraries and ITS units are often key providers.

**Figure 3.19** Programs relating to technological literacy for staff (Q 1.7)

![Bar chart showing number of universities offering technological literacy programs for staff](chart1)

**Key:**
- OptModules: Optional modules for staff
- FormalPD: Formal professional development for staff leading to qualifications

**Figure 3.20** Programs relating to technological literacy for students (Q 1.8)

![Bar chart showing number of universities offering technological literacy programs for students](chart2)

**Key:**
- Opt/NoCredit: Optional no-credit modules for students
- Opt/Credit: Optional credit modules for students
- ITInbuilt: IT literacy built into existing courses for students
- Library: Courses run by the Library for students
Queensland University of Technology’s ‘Techlit’ (Rossiter 1999). This technology literacy project focuses on providing a framework for flexible teaching and learning in the QUT environment, through a suite of resources developed for academic and support staff to enhance student technological literacy. The project aims are to:

- survey staff and students to continue developing a picture of QUT technological literacy requirements;
- identify, evaluate, adapt and develop (as required) resources for a technological literacy resource bank;
- provide tools for curriculum development and integration of technological literacy via examplars and templates; and
- identify and evaluate specific strategies in order to promote the concepts of technological literacy, in key QUT constituencies, while encouraging a commitment to them.

QUT produces a Student Computing Guide which is both paper-based and on the web at <www.qut.edu.au/scg>.

University of Queensland.

1. There is a comprehensive, voluntary, university-wide staff development program available to all staff (academic and general) free of charge. This includes skill development, as well as theoretical/conceptual understanding, and ideas, tips and hands-on-training. These cover personal skills aspects as well as information aspects. These are often also provided for specific departments or groups of people within a common program. Some of these are also available online.

2. The university has recently formed a working party with wide representation to examine the issues of staff IT training and development needs and has funded a position to develop this. There is a commitment to fund the initiatives and to implement the program recommended.

Deakin University.

ITS conducts courses which include beginner, intermediate and advanced training modules in Microsoft Word, Excel and PowerPoint, as well as Pagemaker and other applications. ITS publishes online a list of training courses offered by external providers. The Deakin Centre for Academic Development offers courses through its Academic and General Staff Development Workshops in areas such as: Advanced Web Creation and Design (Dreamweaver, Fireworks), Electronic Publishing, Frontpage for Beginners, Endnote, FirstClass Intranet, Introduction to Interactive Multimedia, MS Excel, etc.
At Griffith University, staff and students have access to the Websters Publishing computer-based tutorials covering Word, Excel, PowerPoint, etc. Other web-based tutorials are available for Endnote, Pegasus, Eudora email, the Internet, HTML etc.

A range of course booklets is available to accompany the courses provided by Information Literacy Services. Full details at <http://www.gu.edu.au/ins/lils/infolit/>.

At RMIT University, a faculty-based approach has been adopted where issues of staff IT literacy are linked to support for the use of the University’s Distributed Learning System. Each faculty has an Educational Services Group and each department currently has one person seconded one day a week (called a Learning Technology Mentor). Extensive central training is given to these staff who then work at a local level—a cascade model of IT training and educational development.
Figure 3.21  ADU assessment of effectiveness of various activities in supporting the uptake of CFL (Q 4.7)

<table>
<thead>
<tr>
<th>Activity</th>
<th>Number of universities</th>
</tr>
</thead>
<tbody>
<tr>
<td>UniW’shop</td>
<td></td>
</tr>
<tr>
<td>FacW’shop</td>
<td></td>
</tr>
<tr>
<td>SoftTrain</td>
<td></td>
</tr>
<tr>
<td>MItStaff</td>
<td></td>
</tr>
<tr>
<td>MItStud</td>
<td></td>
</tr>
<tr>
<td>InfoLitStaff</td>
<td></td>
</tr>
<tr>
<td>InfoLitStud</td>
<td></td>
</tr>
<tr>
<td>EdDesignCourse</td>
<td></td>
</tr>
<tr>
<td>EdDesignUnit</td>
<td></td>
</tr>
<tr>
<td>Consult</td>
<td></td>
</tr>
<tr>
<td>EvalCFL</td>
<td></td>
</tr>
<tr>
<td>CFLResource</td>
<td></td>
</tr>
<tr>
<td>CFULiBrarian</td>
<td></td>
</tr>
<tr>
<td>Assess</td>
<td></td>
</tr>
<tr>
<td>Online</td>
<td></td>
</tr>
<tr>
<td>Grants</td>
<td></td>
</tr>
<tr>
<td>Visitors</td>
<td></td>
</tr>
</tbody>
</table>

Key: See figure 3.18
3.4.3 Effectiveness of ADU activities in supporting adoption of CFL

ADU staff ratings of the activities in figure 3.18, in terms of how effective they believe each activity is in increasing the uptake of CFL in their university, are given in figure 3.21. The data in the survey was in a five-point scale from very important (5) through to not important (1); the data has been collapsed into two categories—important (4&5) and limited importance (1-3) in order to see trends more clearly.
This can be compared with the responses of 73 ASCILITE members’ ratings of how effective they believe each activity has been in supporting their use of CFL materials (figure 3.22). The profiles are remarkably similar. Educational design and individual consultations are believed to be most important. However, as many ASCILITE members are innovators or early adopters (see p. 96 in chapter 6), this congruence between the perceptions of providers and clients must be tempered with the need to provide staff development across the whole range of staff expertise and interest. Indeed, coverage of support for all staff, not just the enthusiastic teachers has always been a major issue for academic development work.

3.5 Integrated support for the use of CFL

We have described some of the work of ITS units, university libraries and academic development units in the section above. Each have identifiable specific roles but the overlap is considerable in many universities and these units often work jointly together. This is important if duplication of services is to be avoided. Figure 3.23 illustrates a few examples of how these units can work together.

It is essential that each university maps the activities covered by these support units and articulates its own model of support provision.
3.6 Online teaching and learning activity

It is clear that there is a great deal of activity about online teaching and learning in the higher education sector. Investment in networks and online teaching and learning systems is widespread; and investment in courseware development exists in all universities; however, there is a great deal of variation in the level of these investments across the sector.

One key purpose of this report is to develop a framework whereby useful information about teaching and learning resources (both online and stand-alone multimedia) can be obtained and the extent of sharing resources can be increased. Just what information is available about courseware resources in Australian universities? How detailed is this information? How accessible is it?

All universities provided information about particular projects and resources at their institutions. Mostly this was a list of projects, sometimes with associated URLs. As one would expect in a survey, there was little information provided about the contexts in which these resources were used, or evaluation evidence about how effective these resources have been in enhancing the quality of students’ learning experiences. However, follow-up at several institutions revealed that comprehensive centralised data about CFL resources is not available at present. Also, the reporting about CFL resources which can be found in the literature is largely self-reporting, and variable in the detail available.
In this section we report on some examples about the level of activity associated with the use of technology to design flexible learning environments to give a sense of the nature of the data available at present—to gauge how much information we currently have which could be used in a national inventory system. We will use information from Macquarie University, RMIT University, Curtin University of Technology, Murdoch University, and the University of Southern Queensland.

### 3.6.1 Macquarie University

The Centre for Flexible Learning has worked to produce a 1998 Inventory of Flexible Learning for undergraduate units at Macquarie University.

The purpose of the *Inventory of Flexible Learning* is to provide an overview of recent practice in undergraduate teaching and to identify:

- how many units have flexible attendance options;
- the types of teaching and learning resources being used; and
- the extent to which the Internet, particularly the World Wide Web, is being integrated into teaching programs.

To develop the Inventory, all coordinators of 1998 undergraduate units were requested to fill in a questionnaire seeking information about attendance options, the type of non-print learning resources employed and the extent to which Internet technologies were being used. An 82 per cent return rate was achieved. The results about the extent of flexible learning activity are summarised in Tables 3.4–3.6.

**Table 3.4** Number of units with various attendance options across the university and in colleges at Macquarie University

<table>
<thead>
<tr>
<th>Attendance required</th>
<th>University</th>
<th>College of Commerce</th>
<th>College of Humanities and Social Sciences</th>
<th>College of Science and Technology</th>
</tr>
</thead>
<tbody>
<tr>
<td>All on-campus</td>
<td>426</td>
<td>75</td>
<td>270</td>
<td>81</td>
</tr>
<tr>
<td>Some on-campus</td>
<td>204</td>
<td>9</td>
<td>102</td>
<td>93</td>
</tr>
<tr>
<td>Either on- or off-campus</td>
<td>95</td>
<td>3</td>
<td>57</td>
<td>35</td>
</tr>
<tr>
<td>Off-campus</td>
<td>89</td>
<td>0</td>
<td>74</td>
<td>15</td>
</tr>
</tbody>
</table>
Table 3.5  Number of units using non-print learning resources at Macquarie University

<table>
<thead>
<tr>
<th>Resources</th>
<th>University</th>
<th>College of Commerce</th>
<th>College of Humanities and Social Sciences</th>
<th>College of Science and Technology</th>
</tr>
</thead>
<tbody>
<tr>
<td>Audio</td>
<td>172</td>
<td>2</td>
<td>113</td>
<td>57</td>
</tr>
<tr>
<td>Video</td>
<td>57</td>
<td>3</td>
<td>40</td>
<td>14</td>
</tr>
<tr>
<td>CD-ROM/disk</td>
<td>64</td>
<td>10</td>
<td>16</td>
<td>38</td>
</tr>
<tr>
<td>Internet-based</td>
<td>103</td>
<td>6</td>
<td>40</td>
<td>57</td>
</tr>
</tbody>
</table>

Table 3.6  World Wide Web presence in units at Macquarie University

<table>
<thead>
<tr>
<th>Web presence</th>
<th>University</th>
<th>College of Commerce</th>
<th>College of Humanities and Social Sciences</th>
<th>College of Science and Technology</th>
</tr>
</thead>
<tbody>
<tr>
<td>None</td>
<td>478</td>
<td>64</td>
<td>367</td>
<td>47</td>
</tr>
<tr>
<td>A unit homepage</td>
<td>135</td>
<td>9</td>
<td>50</td>
<td>76</td>
</tr>
<tr>
<td>Optional web use</td>
<td>171</td>
<td>15</td>
<td>74</td>
<td>82</td>
</tr>
<tr>
<td>Compulsory web use</td>
<td>45</td>
<td>0</td>
<td>11</td>
<td>34</td>
</tr>
</tbody>
</table>

The inventory provides the information above broken down for each department in the university. Relevant URLs are provided which, in most cases, give access to descriptions of the subjects, though not any online materials involved. Several of the subjects in the inventory have produced resources through Macquarie University’s Online Teaching Facility <http://online.mq.edu.au/> (see chapter 7, p. 118). This uses an enhanced version of WebCT.

The inventory does allow Macquarie University to see how their policy on flexible learning (e.g. see <http://www.cfl.mq.edu.au/cfl/flexible/cflflex.html>) is being implemented throughout the university. But it does not provide information about the actual teaching and learning activities used, nor details about how other academics could gain access to specific resources. The coordinator of the inventory, David Rich, commented that ‘it was a huge amount of work, and still looks highly minimalist’!

One example of a successful course at Macquarie is described below. The following vignette shows a progressively developing set of resources that has potential for growth.
Beryl Hesketh and Mark Sabaz have developed an IT-assisted integrated curriculum for units taught within Psychology at Macquarie University in the areas of Organisational Psychology and Human Resource Management (HRM). The project aimed to use web-enhanced features of teaching and learning to facilitate multiple entry points into a curriculum that spans first year through to professional Masters courses.

Currently eight Masters units have web-enhanced features using WebCT. Students enrolled in any of these units have access to appropriate lecture material, bibliographic and reference lists, links to relevant web sites and unit communications tools (bulletin board and email). The Masters in Organisational Psychology homepage can be accessed at <http://www.bhs.mq.edu.au/psy/orgpsy/maorgpsy.html>

Furthermore, students are able to access the thesis and supervised placement information manuals and relevant forms with relative ease. A list of companies where students have been placed to gain professional experience is on the web. Not only does this site aim to provide the public with the knowledge of the Department of Psychology's industry affiliations, but it also allows students to gain background information on corporations they may be required to work for when on placement. In addition to being able to access locally stored information, students are given the opportunity to access relevant global Industrial and Organisational Psychology information sites with relative ease. This was achieved by searching the web and constructing a database of sites of interest to industrial and organisational psychologists.

A concept dictionary is being developed that will be accessible to students enrolled in all units in Organisational Psychology and the HRM program. At the moment the dictionary contains over 200 definitions and it is expected that once it is online it will be updated periodically. At this stage it is not available outside Macquarie. Once developed, there is the possibility of marketing a CD-Rom version.

3.6.2 RMIT University

The difficulty in easily developing an inventory of CFL resources is illustrated by the example of work done in the Faculty of Business at RMIT. These comments were provided by Robyn Lines, Director of Teaching Quality at RMIT Business.
We identified a need to collect data about how we are teaching our subjects some time ago. We wanted it to enable us to plan our strategy for flexibility, to plan for the capacity our infrastructure needed to support, and to enable us to support staff developing subjects and implement some quality measures for teaching with technology.

Our first approach, called the Flexibility Register, was to develop a survey which was trialed and eventually emailed to staff. The response was extremely poor and it became clear that the taxonomy we were using was inadequate and the process flawed. The major taxonomic problem was the definition of ‘flexible’. We had provided a fairly overarching one, but I think it was much too vague to be usefully interpreted by staff.

Our next idea was to develop a database. The agenda had developed at RMIT and it was clear that we were going to need ways of measuring flexibility to meet the T&L Strategy reporting requirements. We still wanted the information for our own purposes as well. There were two issues to be addressed. The first was refining the taxonomy. The second was getting the information into the database.

We are still working on the database and have recently employed a project worker to finalise the database design, set it up and to go around and fill it in with each and every staff member.

The database design, in its current level of development, breaks the flexibility definition issue into a number of parts. We have sections on mode (e.g. F2F weekly, F2F intensive, distance, Summer School), sections on media support (print, online information, online learning experiences, online communication, information CD-Roms etc) and sections on location (in Australia and offshore). We are reviewing it for workplace delivery, which we will probably add to the location section. Our original ideas for the database were for post-graduate only. We are now developing it to cross sectors (TAFE and higher education) and levels of study.

The reason we are employing someone to go around and collect the data is twofold. Staff are very busy and we do not expect a good response from email or paper delivery of the database. Course coordinators do not have adequate detailed understanding of exactly how each subject is taught to be able to be relied upon for detailed and accurate responses and the interaction allows explanation and education to take place. We anticipate that we will be able, eventually, to update the database in a less labour-intensive way. We will build it into our course and subject amendment processes.
At a university level, RMIT is developing a Clearinghouse. The Clearinghouse is planned to provide short descriptions of current RMIT teaching and learning development projects as well as contact details of those responsible. It is an internal clearinghouse at this stage. Staff can browse by department, by media type of nature of technology used, by discipline area, by target student group, by teaching/learning method, or by funding source. The aim of the Clearinghouse is stated as:

Soon, with concerted data entry, the Clearinghouse will become a key resource for all staff commencing projects or facing difficult issues in current practice—you will be able to quickly identify others at RMIT who may be able to offer insights based on experience. Useful tools and materials developed by others may help you address issues in your teaching and your students’ learning. We take a wide definition of ‘project’—it can be any planned improvement initiative which involves investigation/research, design, development, implementation, evaluation and review—though priorities may be on a subset of these activities at any time. The focus is on current or recent teaching and learning development projects. An extension of the Clearinghouse to a product database is now being planned.

The challenge is to develop a sense of community which encourages staff to enter their work. After several months, there are only about 70 entries. At present, only normal collegial incentives exist to encourage participation and this seems to be insufficient. Building in a process of reporting on innovative teaching and learning activity as a normal teaching activity is in progress. Revision of the database structure is planned; in particular, evaluation evidence will be sought and metadata will be used. Issues relating to dissemination and databases are discussed in chapter 9. An example of an entry is:
<table>
<thead>
<tr>
<th>Title</th>
<th>Computer Conferencing and Electronic Role-play</th>
</tr>
</thead>
<tbody>
<tr>
<td>Purpose</td>
<td>The aims of the project are to:</td>
</tr>
<tr>
<td></td>
<td>• Develop interview skills for health assessment of a pregnant woman</td>
</tr>
<tr>
<td></td>
<td>• Enhance problem-solving and clinical reasoning skills</td>
</tr>
<tr>
<td></td>
<td>• Identify key data necessary for assessing pregnancy, maternal and fetal wellbeing</td>
</tr>
<tr>
<td></td>
<td>• Critically analyse the categories of information gathered in the role-play interview</td>
</tr>
<tr>
<td></td>
<td>• Evaluate the information and its implications for professional practice</td>
</tr>
<tr>
<td></td>
<td>• Enhance students’ computer skills</td>
</tr>
<tr>
<td>Description</td>
<td>The project enables students to use computer conference forum to role play a critical incident essential for professional practice. Key elements of role play as a teaching strategy are encompassed in the learning activity including role preparation, role-play and role debriefing. The four case-based role plays vary in complexity and include normal and ‘at risk’ pregnancies. Students have an asynchronous electronic forum for interview role-play, a synchronous electronic forum for ‘role debriefing’, class discussions, chats, and email facilities to communicate with class members and lecturer. The learning activity enables groups of students to research the roles of midwife practitioner, pregnant woman, a support person and an observer. Students prepare appropriate questions and responses, conduct the role-play to interview a pregnant woman and debrief the role and the topic content of the interview. Students develop and enhance appropriate interviewing skills in health practitioners. The role-play also enables students to identify key information essential to comprehensive health assessment to determine the health status of the woman, fetus and pregnancy outcomes.</td>
</tr>
<tr>
<td>Funding</td>
<td>n/a</td>
</tr>
<tr>
<td>Start date</td>
<td>1/9/96</td>
</tr>
<tr>
<td>Completion</td>
<td>01/01/98</td>
</tr>
<tr>
<td>Target</td>
<td>postgraduate student group</td>
</tr>
<tr>
<td>Central T/L methods</td>
<td>case based, role-play</td>
</tr>
<tr>
<td>Media and/or IT use</td>
<td>online communication, hypertext/hypermedia, web page</td>
</tr>
<tr>
<td>Description of IT use</td>
<td>Student learning activities are case-based role-play online, students use conferencing forum for discussion and debriefing. Internet web-based application email for communication synchronous and asynchronous discussion forum in Hypernews.</td>
</tr>
</tbody>
</table>
Processes and outcomes
All elements of online role-play can be adapted to other courses
Template can be modified to develop online subject

• Template for student learning activities to be used individually
  or is accompanied by Pregnancy Simulator Learning Package (PSLP) project.

• Linked to PSLP project (also in Clearinghouse).

Disciplines
Nursing, Health Sciences

Additional comments
The four assessment tasks assess both interview skills and subject content and incorporates a critical reflection of online and traditional methods of teaching this topic. Online evaluation of the learning activity is included in the project.

Contact name
Judy Lyons (other contact details as well)
Department
Nursing Inquiry, Practice and Management, Dept of

3.6.3 Curtin University of Technology

As described above (Figure 3.2) there has been a rapid uptake of WebCT for online learning at Curtin. Table 3.7 shows statistics of current use.

Table 3.7 Current Use of WebCT at Curtin University of Technology

<table>
<thead>
<tr>
<th>School/Area</th>
<th>Units</th>
<th>Number of students*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Business</td>
<td>149</td>
<td>13,528</td>
</tr>
<tr>
<td>Engineering and Science</td>
<td>51</td>
<td>1,958</td>
</tr>
<tr>
<td>Health Sciences</td>
<td>40</td>
<td>1,118</td>
</tr>
<tr>
<td>Humanities</td>
<td>87</td>
<td>915</td>
</tr>
<tr>
<td>Kalgoorlie</td>
<td>8</td>
<td>42</td>
</tr>
<tr>
<td>Muresk</td>
<td>5</td>
<td>115</td>
</tr>
<tr>
<td></td>
<td>340</td>
<td>17,676</td>
</tr>
</tbody>
</table>

* number of students doing WebCT units. Students doing more than one unit are counted more than once. April 1999 figures.

It may be that this rapid uptake of WebCT is due to the previous work in multimedia development at Curtin. For some years there has been a history of successful multimedia development (see, for example; the videotapes accompanying Alexander et al. 1998; Phillips, 1997). The web site <http://www.curtin.edu.au/curtin/imm/IMMProjects.html> lists 54 projects across 26 discipline areas. The last updating was on 23 September 1997; staff changes have meant that this list has not been updated—an issue for all inventory work. Also, it illustrates that the production of an inventory does not necessarily lead to a process where this information is accessed and used,
and maybe results in further collaborative work which would then be used to update the system. Two examples are:

**Superphysics**
This project is attempting to provide assistance to the several hundred non-physics majors (mainly from Biology, Environmental Science, Geology and Public Health) with little or no physics background, who enrol in introductory physics units each year at Curtin University. It is a computer-based multimedia instructional package developed using the authoring software ‘Supercard’. The package attempts to cover most of the concepts typically encountered in the first few chapters of introductory university physics textbooks (e.g. symbols, vectors, scientific notation, graphs and uncertainty analysis) and introductory physics concepts. The shell, navigation and most of the support facilities are completed but only about half of the content is completed (due to lack of funding). A preliminary evaluation of the package using questionnaire and video monitoring interviews have been completed by about 100 students and staff. The results indicated that the package has a number of positive features. These include ease of use and a greater degree of engagement over individual learning styles. A surprising feature is the greater acceptance of the package by female, as compared to male, users.

**Developers:**
- Robert Loss—Original concept, design and programming
- Daphne Sands—Design and programming
- Mario Zadnik—Content and design
- Nick Jenkins—Programming

**Interactive Proteins on the World Wide Web**
We are developing innovative teaching aids on the WWW which will enable undergraduate students to directly interact with and visualise molecules through the use of Rasmol, a molecular visualisation tool. The students also have immediate access to databases describing the intimate details of the structures of hundreds of proteins which helps them achieve a clear understanding of these complex biological molecules. Ultimately this will prepare undergraduate students for a continuing education in the frontier technology of biological science and molecular modelling. We plan to assess student learning outcomes through the use of student evaluations, qualitative observations, and comparisons of pre and post tutorial student examinations on the subject material.

**Developers:**
- Eleanor Stainback—Original concept, design and programming
- Steven Bottomley—Content
- Erik Helmerhorst—Content
3.6.4 Murdoch University

As with many universities, Murdoch University is seeking to meet the challenges of the current and future higher education environment by exploring new markets, different ways of working and alternative delivery methods. They are using the Internet to provide educational services to a wider range of students and in more interesting and flexible ways. These services include library resources, research information, discussion groups and innovative delivery techniques. To meet this need, Murdoch University has established a coordinated Internet service called Murdoch Online, inaugurated on 12 November 1997 <http://www.murdoch.edu.au/online/>. Murdoch Online is concerned with the provision of study through the use of Internet services. It provides opportunities for students to study individual units which are examined in the normal way and credited towards a programme of study. Students will also be able to audit units. Pioneering online units have been developed in a range of disciplines including energy studies, economics, cultural studies, law and education. From the beginning of their program in 1996, the School of Engineering sought to have online study as part of the experience of all their students. To date, there are 26 engineering units online. In stage 1 of the development of Murdoch Online, 52 units were produced. Across the university the number of online units has doubled in the past year, from 71 units in 1998 to 141 units in 1999.

The University has recognised the strategic importance of Murdoch Online, and has recently provided $230 000 through the IT Management Committee to expand Murdoch Online into a mainstream teaching and learning activity of the University through the adoption of the WebCT course management software and the provision of appropriate infrastructure and support.

At <http://www.murdoch.edu.au/online/units/units_fr.html> a sample of the following five units are available which enable the design of the units to be examined. WebCT is used as the basic delivery system.

C288 Economic Thought and Controversy  
E231 Schools in Context  
H231 Australian Cinema  
G1087 Engineering Computing I  
M292 Energy in Society

3.6.5 University of Southern Queensland

Many distance education universities have an infrastructure and orientation which has enabled them to rapidly take advantage of developments in technology and telecommunication systems to enhance their universities'
academic programs. The University of Southern Queensland is focusing on using the following educational technologies:

- computer-mediated communication;
- electronic publishing of course materials;
- interactive multimedia; and
- audiographic techniques and videoconferencing (i.e. teleconferencing).

Over the last three years, this activity has been enhanced significantly and these technologies were used in six whole postgraduate courses and 159 units of study in 1998 (Table 3.8). Each faculty has a three-year rolling plan defining courses, strands of related units and individual units which will incorporate flexible delivery methods, along with appropriate timeframes. Consideration of issues of educational effectiveness and development of the necessary infrastructure are included in the planning.

Considering the flexible nature of the 159 units, 52 units were web-based, including the use of computer-mediated communications; 11 units involved interactive multimedia materials and 96 units only involved the use of computer-mediated communications. The University of Southern Queensland uses an online system called USQconnect <http://www.usq.edu.au/usqconnect/brochure/answer1.html>. There is a demonstration subject online at <http://www.usqonline.com.au/shell.demo.htm>. USQconnect is a computer system which provides students with convenient access to information, services and course resources relevant to their studies from a convenient, central point.

USQConnect incorporates:

- electronic course materials for an increasing number of units;
- access to library catalogues, electronic journals and articles, and text databases;
- secure access to enrolment details, unit assignment and end of semester results;
- faculty information on departments, courses, policies, and staff details;
- email;
- conferencing and group communication;
- Internet access; and
- the Outreach Electronic Noticeboard for external students including Residential School and telephone tutorial timetables, learning circles and other information.
Table 3.8  University of Southern Queensland flexible delivery status report: scope of the 1998 flexible delivery program: unit analysis

<table>
<thead>
<tr>
<th>Development in S1 1998</th>
<th>Offering in 1998</th>
</tr>
</thead>
<tbody>
<tr>
<td>Discrete units</td>
<td>S1</td>
</tr>
<tr>
<td>Web (includes CMC)</td>
<td></td>
</tr>
<tr>
<td>Arts</td>
<td>5</td>
</tr>
<tr>
<td>Business</td>
<td>9</td>
</tr>
<tr>
<td>Commerce</td>
<td>20</td>
</tr>
<tr>
<td>Education</td>
<td>15</td>
</tr>
<tr>
<td>Sciences</td>
<td>3</td>
</tr>
<tr>
<td>Total</td>
<td>18</td>
</tr>
<tr>
<td>Interactive multimedia</td>
<td></td>
</tr>
<tr>
<td>Arts</td>
<td>3</td>
</tr>
<tr>
<td>Business</td>
<td>1</td>
</tr>
<tr>
<td>Engineering &amp; Surveying</td>
<td>2</td>
</tr>
<tr>
<td>Sciences</td>
<td>1</td>
</tr>
<tr>
<td>Education</td>
<td>1</td>
</tr>
<tr>
<td>OPACS</td>
<td>1</td>
</tr>
<tr>
<td>Total</td>
<td>8</td>
</tr>
<tr>
<td>CMC alone</td>
<td></td>
</tr>
<tr>
<td>Arts</td>
<td>14</td>
</tr>
<tr>
<td>Business</td>
<td>33</td>
</tr>
<tr>
<td>Commerce</td>
<td>1</td>
</tr>
<tr>
<td>Education</td>
<td>19</td>
</tr>
<tr>
<td>Engineering &amp; Surveying</td>
<td>7</td>
</tr>
<tr>
<td>Sciences</td>
<td>9</td>
</tr>
<tr>
<td>OPACS</td>
<td>10</td>
</tr>
<tr>
<td>Kumbari</td>
<td>3</td>
</tr>
<tr>
<td>Total</td>
<td>96</td>
</tr>
<tr>
<td>Report: 27 February 1998</td>
<td></td>
</tr>
</tbody>
</table>

3.6.6  **What does this type of information tell us?**

The snapshots presented above show clearly that many universities are actively engaged in producing CFL resources to enhance the educational offerings they have. There is also a clear commitment to developing appropriate infrastructure to support the use of technology. However, the information is patchy and incomplete. Main issues which emerge are that there is limited or no information about:

- the educational design of the CFL resources being produced;
• the incentives and support that existed for individuals to produce CFL resources;
• the experience of using the CFL resources in actual teaching contexts;
• any evaluations carried out to determine how educationally effective these resources are in practice;
• intellectual property and copyright issues which might affect the use by others;
• technical design and access specifications for using these CFL resources; and
• how access can be obtained to these CFL resources from either colleagues in the same university or another institution.

The information is limited because universities have not developed internal inventories with detailed information. This detailed information is not available centrally in Australian universities, though detailed inventory processes at faculty level seem to be evolving. However, at this time the information required to produce a comprehensive national inventory is not available.

It should be emphasised that the limited information reported here does not necessarily mean that the educational quality of the CFL resources being produced is low. One of the advantages of the mainstreaming of the use of CFL online resources is that university quality assurance processes are now recognising that flexible learning and the use of online resources in that context deserves especial attention.

For example, RMIT University has a Good Practice Framework for RMIT Online Learning Environments <http://www.epig.rmit.edu.au/third_level/handbooks.htm#eqa_handbook>. This lists ten principles to guide the development of online learning at the university. These principles are being used in design and evaluation activities with staff.

Also, at the University of Southern Queensland, both the University’s Distance Education Centre (DEC) and Information Technology Services (ITS) sections are fully accredited under international quality standard ISO9001, requiring the maintenance of a comprehensive suite of clearly identified quality assurance processes for all their activities.

This situation of limited data is described by the Centre for International Research on Communication and Information Technologies (CIRCIT 1998, p. 29):

*The size and complexity of the [education] sector makes the process of obtaining representative data cumbersome, and the collation of resulting information monumental. The developmental stage of many*
online initiatives means that information on effectiveness is as yet scarce. The developing online information systems offer the potential to collect such data as it becomes available.

However, it is also important to emphasise the other aspect of this quote, namely that inventory data can now be collected and the time is right for organising processes by which this can be achieved.

The following chapters address these issues in several ways. In chapters 4–7, we will explore policy, culture and support issues that exist to encourage or inhibit individual teachers to develop or adopt CFL techniques and resources in their teaching. These chapters will rely heavily on the case study data obtained at five universities. In chapter 8 we will look at collaboration within and between universities as being a key feature to increasing the take-up of CFL in the higher education sector. Unless the climate within and between universities supports the development and use of CFL resources, there will not be an increase in appropriate uses of technology in teaching and learning.

In chapter 9 we return to considering how best to provide a framework by which there can be sharing of information and resources at a national level across higher education. We will present data from the case studies about what academics want in a database and propose a system which will provide accessible, quality information about CFL resources.
4 Themes and issues

In Chapter 3, we described the resources that exist to support computer-facilitated learning (CFL) in Australian universities. We also raised questions about the state of our knowledge about resources in the sector. In order to understand the nature and extent of CFL resources which could be useful in the new online learning systems that are currently a strong feature of most Australian universities investment patterns, it is important to examine the issues which support or inhibit the adoption of CFL resources and strategies. As described in Chapter 2, this was done by five case study investigations.

The study progressively identified and mapped a number of issues and themes, which were found to influence the dissemination and uptake of CFL in the higher education sector (Figure 4.1).

Figure 4.1 Progressive mapping of issues and themes
There were some issues or factors emerging from the first and second passes which were universally important in all five cases, while others were significant only in particular instances. The universal factors in relation to widespread dissemination or use of CFL were:

- intellectual property, particularly the role of copyright in emerging online environments;
- staff issues and attitudes, namely professional development and training, staff recognition and rewards, and motivation for individuals to use CFL;
- coherence of policy across all levels of institutional operations and specific policies which impact on CFL within each institution;
- leadership and institutional culture; and
- specific resourcing issues related to funding for maintenance or updating of CFL materials and approaches, staff time release and support staff.

The major issues were selected from the case studies using three criteria:

- frequency of being mentioned;
- intensity of expression in the interview; and
- who articulated the idea—senior administration and/or teachers.

Considering the first pass data, table 4.1 shows the frequency of reference to the themes discussed in the following chapters.

<table>
<thead>
<tr>
<th>Chapter</th>
<th>Frequency of reference</th>
</tr>
</thead>
<tbody>
<tr>
<td>5 Policy</td>
<td>96</td>
</tr>
<tr>
<td>5 Intellectual property</td>
<td>64</td>
</tr>
<tr>
<td>6 Culture</td>
<td>168</td>
</tr>
<tr>
<td>7 Support structures</td>
<td>131</td>
</tr>
<tr>
<td>8 Adoption &amp; collaboration</td>
<td>121</td>
</tr>
<tr>
<td>9 Dissemination &amp; databases</td>
<td>90</td>
</tr>
</tbody>
</table>

Other factors held greater influence in specific cases only. External collaborations, for example, were of more importance in three cases (although there were pockets of interest in the others), while standardised institutional infrastructure and policy rated highly in only two cases. The contextual information collected about each of the cases was, therefore, extremely important in assessing or evaluating the impact of particular factors on the uptake of CFL approaches. Institution-wide policy played an essential role in those cases where a standard institutional approach was adopted to further institutional goals with respect to widespread use of CFL. Whereas, institutional policy was less important when increased use of CFL was
promoted through other incentives such as funding, or specific events such as the introduction of new curriculum initiatives.

In the third and final analysis phase the major issues were grouped under broad themes: institutional policy, culture and support. These formed the basis for the following chapters in this report.

The policy theme looked at specific institutional policies, such as equity and intellectual property (IP), the alignment of policy throughout the organisation, the direction of policy change (bottom-up or top-down) and a number of strategic processes which flowed on from policies such as grant schemes.

Culture incorporated factors such as collaboration within institutions, and personal motivation of staff to use CFL, as well as particular aspects of funding, staff rewards and time, leadership, teaching and learning models, and attitudes such as ‘not invented here’.

Support incorporated a whole gamut of institutional issues including IT, library and administrative infrastructure, professional development for staff, student support, educational and instructional design support for academic staff, funding and grant schemes, and IT literacy.

There was considerable overlap between a number of these issues or factors which is illustrated in figure 4.2. The issues are mapped according to how case study participants viewed them. Note that ‘funding’ occurs in all overlap areas.

Figure 4.2  Major factors affecting the adoption of CFL
While the majority of factors were institutionally-based—for example, policy, infrastructure (technical, administrative and support), resourcing and culture—some centred solely on personal or individual responses to adoption or takeup of CFL. The latter included personal attitudes towards technology and motivators which influenced individuals to either become, or stay, involved with the use of technology in teaching.

Still other factors had more widespread relevance, applying to the higher education sector in general, as well as impacting on institutions and individuals. These included use of databases, broad policies relating, for example, to equity (in particular to students’ access and use of computers), and copyright and collaboration between institutions. New issues and considerations emerged when collaboration between institutions (rather than intra-institutional collaboration) was examined at the sectoral level. One factor was competition, which was seen to be a contradictory force which actively worked against dissemination and cooperative or collegial ventures.

Copyright was a particularly complex issue which impacted in different ways according to the contextual level (personal, institutional or sectoral) in which it was being examined. A few individuals, for example, believed university copyright policy presented a personal barrier to the sharing and further CFL development; while, from an institutional perspective, there was concern and a growing awareness of the complexity of the issues which limited organisational capacity to maximise specific institutional uses of CFL. Finally, across the higher education sector in general, there were broad ranging legislative issues with respect to moral rights, licensing, royalties and payments for use of copyrighted materials, and continuing uncertainties relating to technological capability and usage. Figure 4.3 illustrates how the various factors, assuming a thematic status, were operating at each environmental level in the study.
The study uncovered a wide-ranging list of issues and factors which impinge in some way on the use, degree and rate of adoption of CFL. It would, however, be an oversimplification of the complexity of the situation to categorise specific factors and issues as either a barrier or facilitator to uptake. While some generalisations could be made and certainly, some factors tended to act primarily as barriers or facilitators—for example, university academic promotional systems were largely seen as barriers—in most cases it was the contextual information (personal, institutional or sectoral) which determined whether factors inhibited or assisted in diffusion and adoption of CFL.

Perceptions about the extent or degree of take-up of CFL within each case varied considerably among participants. The crux of the argument appeared to focus on whether the extent to which CFL had been embedded related primarily to quantitative criteria (e.g. the number of staff utilising CFL approaches in their teaching, the number of students accessing online forums) or whether qualitative indicators were more significant (e.g. whether evaluation has shown improved learning outcomes).

The data collected, primarily through the case study and vignettes, revealed a high degree of awareness and basic use of CFL across the sector. Executives and senior managers tended to have higher expectations about achieving widespread use; however, they reported lower levels of CFL take-up across their institutions, faculties and schools, than the innovators and those involved in project work. Many participants felt that institutions were still working
under two systems—trying to maintain the trappings of the traditional educational delivery, while attempting to implement new systems—and that this was a significant barrier to embedding new practice. The case study data suggested that there is a trend away from one-off projects to collaborative, multi-disciplinary and team projects, but that these are still largely, though not exclusively, intra- rather than inter-institutionally based. There is, nevertheless, some evidence of increasing commercial business ventures with partners, either geographically or strategically positioned, to further specific institutional aims.

It was found that within each case (faculty, school, institution or project team) there was a significant amount of knowledge about the development and use of CFL, but there was less evidence of widespread diffusion or sharing of this knowledge beyond the boundaries of the case or project. Furthermore, while there were some institutional mechanisms to encourage dissemination (most grant schemes make this a condition), there was little evidence that this was particularly successful, especially if one was seeking to reach or inform later adopters.

Increased use of CFL within the cases studied appears to have been a gradual change process over a number of years, although there was a sense that this process was gaining momentum and that there would be no ‘going back’ to conventional methods. The survey data supported this as well. In some cases, change had been prompted or accelerated by a significant event, such as a new executive or senior appointment, a notable new development opportunity or a substantial injection of funding.

All the cases revealed that an awareness of new and increased expectations from students about the use of CFL in higher education that would maintain the pressure for change. Despite this, there was not a uniform or even pattern of adoption within cases or across institutions. Rather, there were concentrations of considerable activity and enthusiasm, contrasted with other groups which knew little of, or had little desire to become involved in the use of CFL in their teaching. In terms of qualitative change, therefore, no single case was able to report attaining a critical mass of users (Rogers 1995), for while the vast majority of staff use technology in some way, most still believe what they are doing represents a fairly basic, even superficial use.

These issues and their overriding themes, policy, culture and support, will be explored more fully, drawing on the data and evidence in the following chapters.
5 Policy issues

5.1 Overview

In this chapter, we examine some policy directions and issues at the case study institutions. We will look at the individual university cases first, and then look at commonalities and differences between institutions. In this way we hope to emphasise similarity and diversity.

All five case study institutions have the use of information technology as a key policy driver. Indeed, the application of communication and information technology is a key policy issue at all Australian universities (AVCC 1996), but in the two case studies where online technologies were the primary institutional focus, it seems that policy making has become a more challenging, at times contentious, issue. This may well have been related to the more radical nature of the changes in teaching, learning and administration, induced by system-wide online learning environments.

The case study institutions adopt different positions with respect to centralised vs. devolved determination of policy in this area. Striking a balance between top-down and bottom-up policy determination is a key issue.

The faculties studied within the Established University and the Multi-campus University of Technology both claimed their institutional policy directions were essentially bottom-up, but, in both cases, a broad policy direction had been set by the top.

The Regional Distance Education University has adopted a top-down, centralised approach to policy direction, but, despite some initial teething problems and approximately eighteen months down the track, the general direction seems to have been accepted by most staff. There were, however, concerns raised by some staff, for example innovators, about these policies, and although management had some empathy towards their situation, it seems that policy making will continue to focus on mainstream, rather than minority issues.

The Urban Distance Education University has also adopted a top-down, centralised approach to policy direction, but more recently; so there had been little time to fully implement it or assess its impact. Once again, however, this policy seems to have alienated some staff who felt that the new regime might impose untimely restrictions on academics who had just embarked on new online projects. These staff, particularly the entrepreneurs, were concerned
that the new university direction showed insufficient support for individuality and in the long run could stifle innovation.

The Single-campus University of Technology seemed to have had a completely bottom-up policy direction, with apparently little central or school-based policy direction.

5.2 Individual institutions

5.2.1 Established University

Within the faculty studied at the Established University, policy, particularly at the institutional level, was perceived as having had a relatively low influence on the take-up of CFL. This perspective was also shared by staff outside the faculty. Senior management, for example, reported that policy has had ‘no particular effect’ on take-up. One Head of School described the general direction of policy formulation as very much a top-down, meeting bottom-up, approach. The top-down aspect came from the Vice-Chancellor, who was seen as devoting significant financial support to CFL because he saw this as a key factor in the future of the university. The bottom-up approach came from a range of people who are producing high quality materials.

There was, nevertheless, an acknowledgment that there were very broad university policies, such as those which support the use of computers in teaching and learning, which set the scene for more specific initiatives within the faculty. Overall the consensus was that the university adopts an ‘arms length’ position in relation to stipulating what must or should be done, preferring instead to offer incentives.

When prompted, a number of staff highlighted the following policy areas as impacting on the future role of CFL use:

- intellectual property and copyright
- staff promotion
- evaluation of interactive multimedia
- collaboration

Two recent examples where the interests of some areas of the faculty had aligned less well with university directions were specific web technology development, and online delivery for off-campus students. For example, there was growing unease about existing policies and support given by the
university and the faculty to pursue distance education opportunities, by those who perceived the potential for an expanding external market.

In general, however, the point was made convincingly by several senior members of staff that the direction the faculty was taking with respect to being at the forefront of multimedia development aligned well with the policies and mission of the university, and with the policy and funding framework the Vice-Chancellor had put in place.

5.2.2 Multi-campus University of Technology

In this university faculty, policy, at either the institutional or faculty level, proved not to be a major factor in the uptake of CFL. It was generally felt that there were few university or faculty policies which facilitated (or hindered) the uptake or use of CFL. Some staff acknowledged that some fairly generic statements existed, but they basically only set up a structure from which ‘one had to extrapolate’ in writing a grant proposal or justifying an initiative. Many staff had difficulty naming specific policies that related to the use of CFL.

Staff from one school within the faculty reported that while they had not been overly constrained by university policy when developing flexible learning packages for external students, policy provided little encouragement to do so. Current policy did offer some guidelines and a degree of latitude that did not exist in previous years with respect to external students, but there was a sense that further policy clarification was needed, especially in relation to online provision for offshore students.

Overall, there was a strong feeling that what had happened to date had been very much from the bottom-up rather than from the top-down. In fact several junior staff members saw it as positive that management did not always understand what they were doing in developing CFL resources. Nevertheless, management, while not necessarily having a detailed grasp of CFL development issues, was generally favourably disposed towards such initiatives, and the Dean, in particular, was perceived as being ‘very supportive of what we are doing’.

An alternate perspective was given by one respondent, who felt that while there was a broad vision for CFL at the university level, at the faculty level the lack of vision and a lack of resources had prohibited development and adoption of CFL.

In general, however, staff and management reported a close alignment between institutional and faculty direction. Even in a marketing context, one senior academic believed the faculty’s positioning fitted well with the image of the university, citing a collaborative project with an outside organisation as
a good example of a CFL initiative that aligned well with faculty goals to strengthen ties with the profession.

The faculty has developed a new strategic plan for the next five years which seeks to achieve greater integration of CFL approaches across all faculty programs and to promote the use of CFL as a strategy to improve learning outcomes and flexibility. Furthermore, the plan will facilitate the administration of the use of technology in a teaching context and also in a pedagogical sense, because any planned initiative must go through the faculty Teaching and Learning Committee. Overall, management is supportive of the new strategic plan, which identifies specific targets and objectives and aligns well with the university Teaching and Learning Strategic Plan. Also, importantly, continuing progress in regard to CFL had been embedded in the performance agreements of senior faculty management.

A number of senior staff still believed however that there remains significant work to be done at an institutional level about policy, while the majority of staff interviewed believed there was no clear policy framework for:

- academic promotion based on the use of CFL;
- commercialisation of products;
- encouraging collaboration;
- catering for external students, particularly online delivery for offshore students;
- flexible learning; and
- dissemination externally about CFL.

### 5.2.3 Regional Distance Education University

The Regional Distance Education University has adopted policies to promote the systematic use of communication and information technologies, in particular online technologies for teaching and learning. Senior management committees have formulated system-wide policies which resulted in an IT infrastructure designed to facilitate a universal online capability.

While this university has clearly adopted a top-down approach to policy formulation, the direction of policy is achieving acceptance by most staff. One senior manager felt that the direction from above had provided an institutional focus for decisions rather than a focus at faculty or school level and that recent policy had ensured that individual schools did not strike out on their own to their own specifications. The institution-wide system is seen by many as a very clear statement that the university was moving away from a small one-off operation, which would prove unsustainable in the long run and on a larger scale. Several staff from different faculties reported that their
schools were very much in tune with the university online initiative—focused on online delivery and student support.

A number of principles underpinned the institutional policies which were seen as crucial to the success of the online initiative. These included:

- using online technologies to increase the communicative capability of teaching and learning, not just information delivery capacity;
- ensuring access considerations were fully appreciated when devising technical systems; and
- the use of a universal, across-the-board online system which provided a minimum basic standard for all subjects in relation to online support for students.

A senior manager emphasised the importance of institutional policies, but, at the same time, acknowledged the tensions which inevitably occur during this phase—for example, highlighting issues about who is driving the agenda, and the impact such policies might have on various stakeholders within the institution. This view was supported by a member of academic staff, an early adopter who also has an advisory role in the faculty:

I think this university has in one sense got in right in developing an online or technology policy which is top-down—I mean there are plenty of examples all over the world where there are lone rangers doing all sorts of interesting things—it is all very well—and it is not going anywhere. If you are serious about all this then you probably do need a top-down system, but at some point you have to come back up the other way.

It was argued by one manager that the university was clearly looking to the future by putting forward universal policies to ‘kick start’ the whole system, but that at the same time the university would not stymie innovative offshoots from the centralised system. However, some staff, who were early adopters or who had supported the innovators in a professional sense, pointed out that institutional resources, processes and services to support cutting edge development would be curtailed or no longer exist.

Ongoing staff development was seen as a very important issue by all. Some staff had been resisting moving into online teaching, and a real challenge to the university was in convincing academic staff to embrace online teaching. At one stage, staff in one school had dropped out of the online teaching mode, when they were given the choice of participating in online teaching, but this situation has now been reversed. The current message from the university, underpinned by policy, is that effective communication between the students and academic staff, and between students and the university is essential and that online services enable that interaction for all students.
irrespective of their location. The online facility is therefore a resource for
staff to use to facilitate interaction and exchange of information, in the same
way that other resources of the university are available for teaching and
learning.

Other concerns were emerging, as policy directions were beginning to diffuse
across the university. One member of academic staff reported that while the
policy framework of the university was very supportive for online delivery, he
did feel that in the past 18 months the standards approach had made it less
flexible (particularly in the context of offering fully online subjects).

This view was reiterated by a number of staff working at the grassroots level,
where there was some worry that teaching practices were being constrained
by the online policies and procedures. For example, this related to some of
the materials people wanted to put online which were in non-standard
formats, links to school homepages, and so forth. In addition, there was a
view, though not widespread, that what individuals had done off their own
bat was now being ‘institutionalised’, perhaps without due recognition.
Another comment was that staff who had come from a ‘print distribution’
model were trying to impose a quality and standards system that limited the
inherent flexibility of online technologies.

Other concerns included:

- a need for a more holistic approach—academics are ‘tearing their hair out
trying to keep up with what they already have to do, and the University
keeps thinking up new schemes to do more’;
- a need to move forward in a more concerted and coordinated fashion;
- a danger of overwhelming students if online teaching techniques are not
introduced gradually over the life of the course, rather than all at once by
one enthusiastic academic; and
- a lack of a common understanding of the direction the university is taking.

Notwithstanding these issues, many of which related to the ‘bedding’ down of
new policies, the majority of interviewees (both academic and support
staff) believed that the policy was working well, and that it was enticing
staff to use the online teaching mode, and that the university was
increasingly supportive of online developments.

5.2.4 Urban Distance Education University

The primary focus of the case study at this university was on two significant
CFL (online) projects, each of which demonstrated a strong innovative and
entrepreneurial bent. However, it is significant that the university has recently
also embarked on a systematic, centralised online initiative to serve the whole
university. This central initiative appeared to align with the university’s current strategic directions and plans, particularly with respect to providing a reliable and standardised online learning system to serve expanding off-campus markets.

This university has traditionally had a strong reliance on good policy. At the time of the study, the university was moving from a less structured online policy environment to a strong top-down approach. This nexus was placing especially difficult pressures on policy-making processes at the time of the study, with respect to the nature and rate of uptake of online and offshore programs.

The earlier policy environment, described by one member of senior management as ‘laissez faire’, enabled many pioneering projects to follow their own, often successful, pathway. For example, the lack of a university online service provision policy and central coordinated infrastructure in the early days resulted in individuals and schools doing their own thing—one program described adopted Lotus Notes for group communication, another used the services of an external provider, and yet other subjects set up a range of other forums or chat groups. A number of these early, innovative initiatives had developed their own ‘intuitive’ level of policy making. For example, one project has a ‘same day email reply policy’ for students which, while it broadly aligns with the institutional goal of being student focused, may not be appropriate or practical to mandate in other subjects.

In some respects, both the case study projects sat well within the broad institutional directions and policies. One project fitted well with the entrepreneurial culture of its home Division and the leader of the other project commented that their program furthered the university’s entire offshore learning initiative and was building on the very strong institutional flexible learning policy. One of the academic managers interviewed supported the above assessment of the second project, but made a general comment that flexible learning policies had to accommodate particular features of individual programs and student needs.

As indicated, the university is moving towards a widespread, standardised system to support online learning, and in this transition period there is pressure on policy makers to clarify matters related to current practice. For example, a number of interviewees queried whether, and if so over what time period, the pioneering projects would be required to adopt the new, centralised system in order to provide students a common environment for all subjects.

Timeliness, scale and quality control were important considerations, as evidenced in the comment of one senior member of staff who emphasised
that university online policies were not encouraging everyone to ‘rush in’, because it was important to maintain a certain level of quality as subjects are introduced into the centralised model. Additional advantages of a system-wide approach were argued by another senior staff member, who felt that the use of standard formats and ways of operating offered real benefits to students in that they did not have to learn a new system for each subject. This person supported the need for standards, but also recognised the need to foster some innovation within the policy framework.

In many respects, however, this case illustrated the growing tensions between the policies being developed to ‘mainstream’ online and offshore programs across the university and the practices, processes and aspirations of the innovators. A number of the early adopters interviewed perceived a widening gap between their initiatives and the institutional policy framework. One person suggested that ‘the horse has bolted’ and it is too late to enforce processes which may undermine or limit the potential of successful programs. In particular, the inherent time lag in all policy formulation, pointed out by one senior administrator, was seen to conflict with the entrepreneurial goals of the division and the new, groundbreaking ‘best practice’ work being done within their program.

Some academic innovators feared that the current standardised approach was too basic, and ultimately this approach might prove to be too limiting, affecting quality by downplaying the particular requirements of different subjects and different contexts. They felt that decisions about online teaching and learning should be able to be geared to meeting the needs of those students who, for instance, had increasingly sophisticated expectations about online education. Furthermore, while there were technical considerations in establishing university-wide guidelines—for example, in enabling lecturers to edit their own web pages—it was felt that there was also an underlying concern by policy makers that, without such rules, people would publish material that did not meet the university’s requirements.

While a general policy framework has been developed, it seemed that a number of specific administrative problems introduced by computer-based approaches, particularly online ones, have emerged. These, administrators and academic managers acknowledged, will require ongoing monitoring and modification of policy.

Collaboration on projects is an example—with an increasing number of entrepreneurial initiatives blooming across the university. Officially all such projects, whether delivered locally or offshore, need to be approved by Academic Board, even if the course already existed in another form. But it appears that, often with the best intentions, a number of new collaborative
initiatives had not been developed, or at least only partially developed, within policy guidelines. This again highlights the tensions that can arise between rapidly rising and potentially rewarding opportunities, and the policy-making processes necessary to ensure long term sustainability of innovative programs and the protection of university standards.

One senior administrator highlighted a number of policy implications when working with offshore agents, where the agent acts as an intermediary between university administrative requirements and students. In such cases, policies are needed to ensure the host of university information system requirements are met, and, for example, to cover plagiarism from online sources. Copyright, discussed later in this chapter, was also looming as an increasingly complex and grey area.

The difficulty and complexity of developing a policy framework to support new approaches right across the institution was acknowledged. It was felt that the university was about half-way through this initial process, and had learnt some valuable lessons upon which it could build. It was to this end that the university was investing considerable energy in ways to support and encourage academic staff, particularly ‘mainstream’ staff, in their transition to an online learning environment.

### 5.2.5 Single-campus University of Technology

In the view of case study participants, the Single-campus University of Technology had placed little importance on policies about adoption of CFL. Unlike the other four case universities, there was no direction from the top about the adoption of CFL.

The innovations developed in the school studied at this university arose almost entirely from the bottom-up. The view of a senior manager was that CFL was not an area which had been strongly pushed. Rather, developments were the result of motivated people making it happen. Other respondents had the view that CFL adoption was a result of people making the time themselves to develop materials for their own use. There did not appear to be a school policy, as such.

It was felt that there was a lack of alignment between university policy and policy at the school level. However, staff interviewed seemed to be unclear about the details of the university strategic plan. The only area in which university policy impacted on CFL was in targets for numbers of computers per student.
5.3 Common concerns across all institutions

While the five case-study universities had their individual profiles in terms of their policy approaches to CFL, there were a number of issues which were common to most or all of the institutions. These will be discussed in the remainder of this chapter. The issues are:

- administrative processes
- equity issues
- funding
- staff recognition and rewards
- intellectual property

5.3.1 Administrative processes

There are a number of policy issues associated with online delivery, both locally and offshore, which need to be resolved by new administrative procedures. These problems are pressing for universities which offered online courses internationally. The online approach introduces a range of specific administrative problems, for example with respect to plagiarism and electronic information, and these require modification of policy which, unfortunately, is often subject to an inevitable time lag as appropriate expertise and input is sought.

A related issue for several universities is the policy implications of working with offshore agents, who act as intermediaries between the university administration and the students, but did not necessarily understand the administrative requirements of the university. An alternative, but in many ways a less attractive solution, is to avoid problems with intermediaries by asking academic staff to take on those administrative processes when they visit their offshore students. The third option is to develop information systems that will handle administrative needs for students at a distance. One university was currently using combinations of all three methods, depending on nature of the program and where it is being delivered. Lack of coordination seemed to be an issue, with two different areas within one school choosing different modes in the one offshore location.

A number of staff felt that the distinctions between teaching methodologies for on-campus, distance and international students will gradually disappear, and that online developments simply add to the existing suite of distance education provision, instead of replacing them. Staff also had the belief that the divisions between on- and off-campus students and full-time and part-time subjects were artificial, and that there was a need for more flexibility. However, the blurring of distinctions between modes of study will require
significant changes in administrative support, and that under these arrangements, new IT support systems would be very important in accommodating these changes.

5.3.2 Equity issues

Equity of access to computing facilities by students arose as an issue of concern at most case-study universities, particularly at one university which has equity written into its enabling Act of Parliament.

There are a significant number of students who do not have computers and who therefore may not be able to access online courses. Even if students do have computers, they may not be sufficiently advanced to access online materials, and may not be equipped with a modem. Many universities feel unable to take full advantage of online technologies until the issue of access to computing facilities has been solved. For example, those institutions at the forefront of online delivery argue strongly for government intervention and leadership in this matter. They claim that the current situation, which prohibits universities from requiring students to have access to a computer, is a major impediment to uptake. Instead, they believe safety net measures should be in place to assist financially disadvantaged students, rather than ‘withholding’ the potential advantages of CFL approaches from the majority of students, because of the needs of a minority. The current unsatisfactory situation, one senior manager suggested, raised considerable uncertainties about the strategic advantage of online programs at present because of the issues associated with equity of access to students.

Currently, most case-study universities treat online course material as an additional option, instead of replacing existing modes of delivery. Many staff argued that the online approaches in their subjects are used in conjunction with other tried and true methods to ensure that students have a choice about how to receive materials. Ultimately, however, one or two entrepreneurial staff reasoned that it always comes down to a choice, that students will ‘vote with their feet’, and that one cannot always be constrained by policies developed for the minority. These staff supported the view that safety net policies should be implemented to address the specific needs of the minority.

The major issue, therefore seemed to be that universities could not legally require students to have access through an online system. There are existing anomalies to the access and equity requirements, however. For example, one faculty has a rule requiring students to have access to its specialist library, but cannot mandate the same with respect to computers. The only exception was for students enrolled in full-fee paying courses.
For universities where students undertake CFL work in an on-campus mode, access to laboratories is also a barrier. The pragmatic view expressed was that some pressure could be removed from laboratory facilities if students could be required to purchase a modem.

Respondents from several universities requested policy guidance from their institution or from the government about requiring students to have computer access before undertaking online courses. Faculties were cautious about committing completely to CFL developments until equity issues were addressed by either the university and/or government. It was strongly felt that the power of the communications technology would not come to fruition until institutions can make the assumption that all students are online.

\textit{It is something the government needs to address—if we are going to be global or international in our time, competitive as a nation which is the rhetoric that comes out all the time—that we must have all our students use computing technology as a tool of trade. No graduate should come out without those skills—otherwise it is false equity to say ‘we won’t introduce it because it will be disadvantaging a proportion’.}

The situation will need to be constantly monitored to provide an accurate indication for planning and policy purposes. The work of the ‘borderless education’ research team (Cunningham et al. 1998) described in chapter 1 is important in this regard.

### 5.3.3 Funding

Funding, particularly grant-funding, was seen as an important issue. Institutions funded CFL innovations in differing ways and to different extents.

The Established University had expanded its grants scheme significantly, covering undergraduate and postgraduate coursework. There are strategic grants at a faculty level of $100,000 or more; project grants of $50,000; pilot grants consisting of mainly time relief to explore new ideas; and priming grants, for people with no experience at CFL. The current priority is related to a substantial commitment to piloting and priming.

An academic manager at the Multi-campus University of Technology felt that there were too many similar applications, too many examples of people proposing similar initiatives. This person felt that it would be preferable to simply allocate $200,000 to the Dean, with the instruction to ‘use it to the best of your ability’.

The Single-campus University of Technology had a more restrictive attitude to funding CFL developments. It was viewed as encouraging developments, but not with significant funding: ‘I think they occasionally throw $10,000 out and
say: If you’ve got any good ideas, let us know’. The same university, however, is actively looking at mechanisms whereby each student can obtain computer access.

A particular issue with respect to centrally funding CFL developments is that funds have to be clawed back from other areas of the university, especially teaching areas.

One case study university had established an agreement with another university which specifically allowed funding for collaborative inter-institutional projects. This is discussed further in chapter 8, Adoption and Collaboration.

Many interviewees felt that current grants schemes are very ‘outcome’-oriented. Grantees are funded to produce a product, and have to guarantee that the product will be integrated into the course. However, it may turn out that the project does not achieve its objectives, and that the teaching problem may be solved better in another way. Currently, it is not acceptable to admit failure, but it was felt that it would be beneficial to be able to do so, in a formal way, so that others do not attempt to do the same approach.

A particular difficulty with funding of CFL developments was that there was no provision for ongoing development and maintenance. Some respondents felt that universities needed to make provision for the need to upgrade and maintain existing resources, but that this does not occur at present. It is unlikely that this issue will be resolved until the funding model evolves from the current emphasis on one-off project grants.

### 5.3.4 Staff recognition and rewards

Staff recognition and rewards arose as a major issue by case study participants. This issue is discussed in more detail in chapter 6, Culture, but some aspects are relevant in a policy sense.

There was a very strong view expressed that academics developing CFL materials craved recognition for their extra efforts and innovation. While promotion was not the only way suggested in which recognition may be given, it was a major consideration.

Most universities include teaching performance in their criteria for promotion. However, while teaching performance was nominally equal on paper, there was a broad perception that, in practice, research performance counted much more highly. One staff member received the Vice-Chancellor’s award for excellence in teaching, but was not convinced, and did not believe that the
majority of staff were convinced, that teaching counts sufficiently for promotion.

A major contributing factor to the perception that teaching is not valued is that there are no clearly articulated criteria or recognised benchmarks for good teaching practice. It was felt that evidence of teaching was not presented as clearly as research evidence, and that this was a staff development issue. It was recognised that some staff used 'teaching portfolios', but it was felt that more effort should be invested in recording genuine outcomes of teaching performance through evidence of evaluation.

One case study university is considering allocating recurrent funding based on teaching outcomes as well as research outcomes. This is already the case at Murdoch University, where a proportion of annual EFTSU funding allocations are based on teaching performance.

The lack of clearly identified criteria for teaching excellence clearly hinders the appropriate recognition of staff involved in CFL developments. This is an international issue and substantial work is being done on in the UK on benchmarking teaching qualifications and accrediting university teaching (Staff and Educational Development Association (SEDA) <http://www.seda.demon.co.uk/pdhe.html>). Once criteria have been developed and are being used, then peer pressure will be more effective as an incentive to adopt CFL materials.

### 5.3.5 Intellectual property issues

Intellectual property (IP) was a significant factor influencing development and adoption of CFL at universities in Australia. Issues of concern derived from this study were:

- Policy regarding the ownership of CFL has been a definite barrier to adoption at some universities.
- There is a range of levels of policy at different universities.
- There appeared to be a lack of understanding of IP issues by many staff.
- Administrative matters with respect to IP and CFL caused difficulties to staff.
- Some broader, legislative issues need to be addressed.

The rapid development of online technologies has outstripped the ability of the legal system to keep up with the changes. This view was reflected by many case study participants in a number of ways, as described in the rest of this chapter. Expert advice on the current state of play with respect to copyright and intellectual property as they relate to CFL was sought from an
acknowledged authority, Fiona MacMillan of the Asia Pacific Intellectual Property Law Institute at Murdoch University. Her report is presented in full in Appendix A, and relevant parts of it are referred to when analysing the perceptions of staff and managers in the rest of this section.

There are two main aspects of intellectual property which affect universities and their staff: the intellectual property rights of university staff and their employers with respect to CFL materials which had been developed at the university (who ‘owns’ the materials); and the intellectual property rights (copyright) of people who own CFL materials of interest to university staff (how are people who ‘own’ materials protected from others unlawfully and unethically copying them). These will be discussed separately in the next two sections. The final section raises issues which need to be addressed or are being addressed at the level of government.

5.3.5.1 IP developed as part of employment

The purpose of copyright law should be regarded as the encouragement of creative endeavour, and the main method of encouragement is to give an economic right to the creator to prevent others using the work in certain ways (see Section 1 of Appendix A). In an academic environment there may be other motivators for the creation of IP, such as publication records. It was the view of several contributors that an IP policy which motivated staff should address the issue of rewards (in whatever form) for creators.

Under the Copyright Act, the first owner of copyright is the author of the work, except if the work was created in pursuance of the terms of employment (paragraph 3.1.3 of Appendix A). Paragraph 3.1.4 of Appendix A questions whether academic authors are employed to create copyright works and posits that, apart from explicit contractual provisions, academics retain the copyright in the material that they create. However, if a copyright policy is part of the normal conditions of employment of an institution, then this overrides the staff member’s right to own copyright.

Of the 25 universities who responded to the appropriate part of the survey, only 14 reported that they had an IP policy for CFL materials produced by staff at the university. Of those 14, only five reported that they had a policy encouraging collaboration with other institutions. Similarly, 14 institutions supported commercialisation of CFL products, whether through IP policy or otherwise, and 12 had guidelines on quality assurance of existing CFL materials being used at the university. It should be noted that there was a range of responses to these questions. In other words, there was not a uniform response from the 14 universities. Some examples are:
At Sunshine Coast University, there is a university-wide policy for IP. CFL materials are not specifically mentioned though the word multimedia is used within the policy. There is a section on agreements with third parties whereby the University may enter an agreement with another party which provides for control, ownership and exploitation of IP.

At Monash University, the IP policy was not drafted to specifically encourage collaboration. However, specific policy has been drafted to support collaborative courseware development (including IP matters) between Monash and Melbourne Universities.

At the University of Ballarat, quality assurance of curriculum design and resources is undertaken at University level and is required to meet policies on: 1. Curriculum models and guidelines 2. Academic handbook 3. Flexible Learning and Teaching Statement 4. University Council Strategic Focus on Flexible Delivery.

There is also a wide range of approaches to IP policy. Some universities, particularly those with a strong distance education background, such as the Regional Distance Education University and the Urban Distance Education University, had well-established policies. It was quite clear at these institutions that teaching and learning materials created in university time belong to the university. In the main, at these two universities, institutional policy does not seem to be questioned and largely does not seem to hamper the development process between academic staff and educational designers.

There was a larger variation in opinion at the other three case study universities about IP policy. While each institution had an IP policy, there was varying awareness of the content of these policies, even by senior managers. There were also varying views about the ownership of IP and who would receive the rewards associated with the copyright of CFL materials. Despite the lack of knowledge about policy, IP up until now was generally not felt to be a barrier to the development of CFL.

A feeling was expressed that, in the past, universities have not been particularly interested in copyright as a revenue raising form of IP. Universities have been interested in patents, but now they can see potential sources of revenue from the copyright on online products, and have increased their interest in copyright.

Three of the five case study universities have recently reviewed, or are in the process of reviewing their IP policies, but details were not available in all cases.
The Established University had found that its previous IP policy had acted as a barrier to the development of CFL resources, and had recently taken an innovative approach to finding workable solutions to copyright at the institutional level. The essence of the new policy was based on recognising the relative input of all contributors, either as an ‘originator’ or a ‘contributor’ to a project. Originators are members of academic staff; typically they come up with the idea, are responsible for the intellectual content and drive the project. Contributors are professional people who have the expertise to make the program happen (e.g. programmers) and add value through design (graphic, instructional), etc. The new policy is a way of negotiating the recognition and rewards which might accrue to all stakeholders (individuals and institutions). It also provides some options to address the previously thorny issue of commercialisation, by asking individuals to recompense the university for its outlays (grant monies, etc.) if individuals commercialise the product. Individuals wishing to commercialise a product may either licence it out (so that the IP still belongs largely to the university), or negotiate with the university to have the IP deeded back to themselves, either through license or sale. Carter (1997) discusses factors that need to be considered when entering into a commercialisation arrangement. These include: ownership of product, copyright clearance, venture risk, negotiating position, capital input, the relationship with the publisher, and profits.

In the main, those who had detailed knowledge of the new policy were very encouraged by it, in one instance believing that IP would no longer be a barrier for development. Others, however, felt the new policy still did not adequately address the complexities which arise with respect to collaborative grants and commercialisation. However, these complexities are arguably beyond the scope of IP policies, per se.

5.3.5.2 Barriers caused by IP policy

Respondents at several universities felt that policies which assigned IP to the university acted as a disincentive to development of CFL materials:

_The new copyright policy will actively discourage a lot of people from doing anything within the university parameters. It is not in keeping with the spirit of the Copyright Act—it’s a blatant attempt by the university to secure the rights for itself which it is not otherwise legally entitled to._

In a similar vein, it was reported that some products have never been disseminated as they should have been because of the line the university took on copyright and royalties. Further evidence of this is presented in the vignettes on StatPlay and Services Marketing. In other cases, staff have not taken part in developments because they could not gain a share of the proceeds.
In many cases, it was not the IP policy, per se, which was a barrier to the adoption of CFL. Instead it was the institutional processes, which were either not sufficiently developed, or acted as disincentives to adoption. Several criticisms about IP processes were expressed at the Established University before its new IP policy was adopted. While these particular issues may have been resolved, they point to potential difficulties at other institutions, and are worthy of note here.

Many individuals faced with IP issues arising from their projects have found solutions to their particular problems, but that the process has been messy, inefficient and time-consuming. The time required to resolve IP issues was seen as a particularly important issue which acted as a deterrent to becoming involved in CFL developments. In one instance, the IP owners had reached agreement about their relative contributions, but it was reported that the university took eight months to approve the agreement. Processes surrounding IP clearances were perceived as so inefficient by several individuals that it led to them ‘reinventing the wheel’.

There was a widespread view that bureaucrats and university lawyers were reluctant to make decisions about intellectual property:

*Bureaucracy, rather than lack of clarity was holding people back I think —the red tape at the layer of lawyers. It certainly made us think a few times —is it worth it?*

One impression was that IP had acted as a barrier because of uncertainties as to who owns the IP and how some incentive might be derived from sharing in IP.

There were general feelings of frustration, uncertainty and concern about IP issues:

*If somebody says ‘you’re not handling IP right’, I’ll say ‘forget it!’ I’m not going to go in for more grant money and more creativity until this university gets it totally sorted out.*

There was a strong feeling that individuals were not able to get timely and appropriate guidance on managing copyright issues, particularly in relation to collaborative projects. Individuals reported frequently that when they tried to use existing university guidelines or when they contacted the appropriate people in the university, they ended up in a discussion rather than getting a definitive answer. One respondent viewed it as a ‘minefield’. A view was expressed that intellectual property need not necessarily become a problem as long as issues are resolved at the outset. These issues are contextualised in the following vignette. It includes a good summary of IP issues at the end.
IP issues affecting the development of StatPlay—a joint project of Neil Thomason, Department of History and Philosophy of Science, University of Melbourne, and Geoff Cumming, School of Psychological Science, La Trobe University (Les, Cumming, Thomason & Finch 1997; Cumming, Thomason & Les 1997).

The first major phase of clarifying IP issues took 18 months and culminated in the signing in July 1997 of agreements with each of our two universities. In each case the university assigned ownership of IP in StatPlay to the two academic principals (Cumming at La Trobe, Thomason at Melbourne). The agreements differed on detail, but in both we agreed that the university should have a royalty-free licence to use StatPlay for its own educational purposes. Some repayments would need to be made, notably of university funds allocated specifically for development of StatPlay; such repayments would be due if there were any commercialisation profits.

These agreements seemed very fair and reasonable. The crucial point was that assignment to the principals meant that investigation of commercialisation could proceed with confidence that the IP situation was clear, and contract negotiations did not have to involve all parties (i.e. universities as well as principals), with the great danger that IP decision-making delays could sink commercialisation prospects.

Achieving these agreements took so long (18 months) because policy development and/or IP managerial rearrangements were going on at the time in each university, to some extent prompted by our case. There was good will and cooperation by the key university staff members involved, and recognition that commercialisation (which everyone states they support) will not happen unless clear and reasonable IP agreements can be finalised in reasonable time. Of course, future cases are now expected to be handled more promptly and easily!

A recent complication is that a colleague from Monash (Kevin Korb) has joined us for part of StatPlay development, and a joint Melbourne-Monash grant has been obtained, subject to IP agreement. It has been tricky to decide on a basis for such an IP agreement, for what is only a small part of the whole of StatPlay, yet cannot sensibly be separated from the whole. The main decisions about shares and licences and assignments were made quite easily, within a couple of weeks, with good cooperation of all parties. It then, however, took a further four full months to finalise drafting of the agreements. This involved numerous emails and phone calls and, for the university that has outsourced its legal work, references downtown of successive drafts. The serious overwork of everyone in universities was a factor, as was the size and complexity of the whole project. This IP effort was way out of proportion for a $50 000 grant.
Recently a serious IP issue has surfaced, relating to CAUT and CUTSD grants. In the CAUT years the agreements signed by academics and institutions accepting grants made no mention of IP being retained by the Commonwealth. There were obligations to make the results of the work available, but the IP was assumed to be a matter for the grantee and the receiving university.

More recently, however, the guidelines for CUTSD 1999 grants stated that ‘ownership of IP resides with the Commonwealth which may on request transfer copyright to the institution(s)’. This is in stark contrast to the situation with other Commonwealth competitive grants schemes, ARC for example, where IP is assigned to the receiving university, which is expected to encourage commercial exploitation where appropriate, and to strike the right balance between incentive to researchers and protecting the public interest, given the use of public funds.

The conditions of offer for the 1999 CUTSD grants did not follow what had been stated in the guidelines, but included:

8.1 A request to commercialise a product which has been developed as a result of grant funding must be referred to DETYA for consideration.
8.2 In approving a request under clause 8.1, DETYA may impose such conditions as it considers reasonable.

Further, we know of a case in which DETYA has claimed IP ownership in relation to an early CAUT grant, and has taken a very long time to negotiate a licence for commercialisation. After many representations to DETYA, and work on a standard licence proforma, DETYA has responded to further legal advice by changing its policy. It no longer claims IP generated with CAUT/CUTSD funding. This is an enormous advance.

Some matters for consideration in relation to IP are:

- It is a big and important issue. Try to sew it up early. Expect to have to put in time and effort.
- The IP policies of granting bodies and universities need to recognise the reality that commercialisation is unlikely unless authors and researchers have good incentives, and bureaucratic hurdles can be minimised.
- All sorts of complexities can emerge, especially when more than one funding source and/or more than one university are involved.
- Commercialisation is hard enough; if IP negotiations become mixed up with commercialisation negotiations, the chances of success are reduced and may disappear. Achieving clear IP agreements in advance is important for commercialisation.
- The recent policy change by DETYA means that DETYA no longer claims IP ownership. This is a very welcome development and should ease the route to commercialisation.
While the issues in StatPlay have been solved along the way, albeit with considerable effort and time, there are many situations when the difficulties have meant lost opportunities that have not been revisited. This is illustrated in the following vignette. It is important that the lessons of these earlier missed opportunities be learnt.

**Stewart Adam teaches Services Marketing online**

In mid-1996, OLA advised that a Services Marketing unit was required. RMIT’s now School of Marketing decided to carry the development costs for an online version. The project proceeded. The unit would be offered through the OLA marketing channel only and not to RMIT students. It was decided that recognised external services marketing authors would be contracted and these academics and practitioners would be supplemented with RMIT teaching staff where possible.

Owing to issues concerning the low payments and authors’ intended use of their own materials for refereed articles and textbooks, authors agreed that a two-year non-exclusive license would be offered to RMIT. This was in line with commercial practice where the use of assets and not necessarily ownership gains revenue, profit and cashflow.

In 1997 a colleague at another university expressed the desire to license the materials from RMIT over a single semester in 1998, for the sum of $5,000. A brief was prepared and forwarded through the Head of Department and Faculty of Business for RMIT to prepare a legal contract. The university lawyers were briefed, and after some four months failed to produce a contract. No explanation was ever provided to the academics involved for this failure to enable the project to earn income that might have been used to further develop the online materials involved. This door has never been re-opened.

5.3.5.3 IP belonging to others

The access to and use of intellectual property developed by other people and other institutions was an issue. Partly, this has been covered in Chapter 9, under Dissemination. However, some particular issues were raised in the case study which relate directly to IP.

One issue was that many academic staff did not see copyright as a concern for them. They felt that they could simply use copyrighted material in their teaching. While this is legally the case for print-based materials based on the fair dealing exemption for research and study (see section 4.4 of Appendix A), it is currently not the case for online materials, particularly when they are re-published online. There appears to be fairly widespread ignorance of the
legal position outlined in Appendix A. A summary of legal issues relating to copying work of other people is shown in Table 5.1. The vignette on the Atmospheric Science Program at Macquarie University shows a common situation—reasonable care about not infringing copyright, but not, at this stage, a clear planning process for how future IP agreements might evolve.

Table 5.1  Summary of legal issues relating to copying work

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Andy Pitman and others teach Atmospheric Science at Macquarie University. This is one of the largest programs of its type in Australia. Currently, most of the Atmospheric Science Program is delivered via the Internet. The main aim has been to enhance the quality of the existing program and maintain the number of units being offered. A secondary aim was the recognition that specific teaching applications could be offered better using Information Technology than in traditional ways (animation of atmospheric phenomena, transitory change in climate warming, etc).

Some components remain taught traditionally (e.g. fieldwork) and will continue to be so for educational reasons. All course notes are available electronically. We found a massive suite of information on the Internet to offer to our students. We had to be very careful over how we sourced material to avoid considerations of copyright when using internet material.

We have implemented approximately 50 per cent of formal practicals electronically (these include, for example, sophisticated simulation exercises) and we provide our students with electronic library access, internet access, email and bulletin boards. These have been integrated into the teaching program and are not simply additional resources which may or may not be used by the students. The simulations have been developed in-house. At present they are not being used elsewhere but there are possibilities and general discussions are taking place. IP issues have not been investigated thoroughly. There is a preference to make the materials available on a collaborative basis.

Clearances could be obtained to use copyrighted material online, but this is a very time-consuming process. Some larger projects had dedicated copyright
officers, but this is not a viable option in the majority of cases, for funding reasons. There was a common consensus that copyright issues were restricting the adoption of CFL. One view was that even if people were aware of appropriate CFL material, they would not use it because of the difficulty of obtaining permission.

A particular barrier was the inability to digitise print-based works for online use, because copyright law does not allow the electronic duplication of print resources. It is hoped that the forthcoming Copyright Amendment (Digital Agenda) Bill (1999) will resolve this issue in the near future.

At one case university, the protection of staff members’ own work was an issue. Evidence was presented of staff from other institutions taking course material from the web and using it without acknowledgment. In addition to the illegality (section 2.9 of Appendix A), the ethics of this practice was a concern to some respondents, as was the possibility of such ‘pirated’ software being modified and then disseminated as the pirate’s own work. It was felt that pirating was not necessarily done out of malice, but because of a lack of time and support to seek proper acknowledgment. A related feeling was that if such material was acknowledged then it would provide a reward for the originator of the material.

The model being developed by AEShareNet (the Australian Education ShareNet) (<http://www.aesharened.net.au/>) will be of value to the higher sector as well. AEShareNet is aiming to establish, through national co-operation, an online system for transacting copyright licences in VET materials.

AEShareNet has two fundamental purposes. First, to create efficiencies in the exchange of copyright VET materials similar to the economies of scale offered by a stock exchange, where members can extend copyright licences and transact related business without preparing a fresh set of legal documentation in every case. Second, AEShareNet aims to contribute to the effectiveness of the national VET system by facilitating a more open market for the sharing and trading of VET materials.

5.3.5.4 Ability to customise

The inability to customise CFL materials from other sources to the local environment due to copyright restrictions poses a significant barrier to adoption of CFL. A view was expressed that it would be very useful if mechanisms could be established so that materials belonging to publishers could be customised. That would save us having to do all the work from
'Intellectual property was also a problem in collaborative projects, exemplified by the StatPlay vignette above.

Librarians and owners of resource sites also have IP difficulties with metadata (see Chapter 9, Dissemination and Databases) in that if a CFL resource had used a different metadata schema then it could not be easily legally changed to suit the schema of the resource site.

5.3.5.5 Legislative issues

Some staff from one of the case study faculties felt that the Copyright Act itself was a major problem. The whole issue of copyright was ‘up in the air’ at the moment. There was a general feeling that it is easier to develop one’s own resources ‘in house’ than to use or adapt someone else’s, exemplified by the vignette from Central Queensland University. Of course, there are significant resource implications if all staff wishing to use CFL find it necessary to create their own resources themselves.

Universities offering offshore courses are unsure of the legal situation with respect to IP, particularly, which country’s copyright laws and exemptions apply to course materials (including CFL) used in offshore courses. Section 6 of Appendix A points out that there is a high degree of international uniformity about copyright law, but the general position is that it is the country in which the infringement occurs whose law applies.

It was felt that the passing of moral rights legislation might facilitate the sharing of CFL materials (see section 5 of Appendix A). Moral rights will provide some insurance to the owners of CFL materials, that any amendments made by other adopters of the CFL will not detrimentally affect the reputation of the original owner. It was felt that moral rights legislation may provide a release to the tension between universities and academics about the ownership of IP developed in the course of employment. One suggestion was that moral rights should always follow the individual and that economic rights reside with the person who pays. Moral rights legislation is currently before the Parliament.

The vignette which follows illustrates how one academic has approached copyright issues in a pragmatic way. The costs involved in time and effort have been very high, but remain hidden. Avoiding copyright issues by redoing the same work is not efficient or cost-effective. It is a ‘band-aid’ solution to the problem of copyright for digital resources.
Lynn Zelmer from Faculty of Informatics and Communication (Infocom) at Central Queensland University (CQU) teaches the core first year multimedia unit, 00101 Introduction to Multimedia Systems, which introduces students to the broad spectrum of multimedia technologies so that they become enthused about the discipline and aware of its potential. The multimedia degree is an applied, rather than theoretical, program.

Infocom decided on a strategy of providing generic skills, rather than using the most current industry-standard tools. Thus, the only absolute software requirements for 00101 are a word processor, PowerPoint or ‘an equivalent presentation’ package, an image manipulation package capable of manipulating the supplied JPEG stock image files, a file editor and a web browser. On-campus students have access to a digital camera and a flatbed scanner and distance students receive a mail-in ‘coupon’ entitling them to a limited number of image scans through the Faculty.

One of the main components of the 00101 package is a stock image and sound library. Comprising of over 1000 low resolution images and 100 short sounds, this stock library enables students to experiment with multimedia and complete their assignments without copyright difficulties. When first planning the unit it was argued that students should be able to use ‘clip art’ and other image files freely available from the web or through low cost CD-Roms. Investigation revealed, however, that many of these materials were of doubtful provenance and had restrictive copyright provisions. It proved easier, and far less expensive, to utilise photographic images from the author’s collection than it was to obtain clearance to duplicate and use an existing commercial collection. Sound and music collections are even more restrictive. The collection on the student CD was digitised from sounds collected by a student and the author.

CAL, the Copyright Agency Limited, has procedures for academic institutions to duplicate relevant topical magazine and journal articles in print form. Regrettably, these procedures do not extend to materials to be distributed on disk, CD-Rom or via the web. To overcome this the author wrote a series of precis, reviews and short articles to accomplish the same purpose or, in some cases, to bring the same material to the attention of the students. The result is a collection of over 30 short articles which contextualise multimedia for the Australian student.

There is little awareness of the amount of time and resources actually required to develop and deliver units utilising new media. The Faculty’s official records, for example, would suggest that the development of 00101’s learning resources ‘cost’ approximately $5 000 plus a workload allocation of three to four hours per week. Instead, the resources cost over $10 000 in direct expenses, over 1 500 hours of academic staff time and over 250 hours of unpaid student time, and a multimedia development infrastructure (the author’s facility, Educational Media Services, etc.) worth several hundred thousand dollars.
In the following vignette, the use of ‘free’ resources has meant that the resultant unit cannot be freely made available and cannot be used for profit. This may restrict possible future directions.

Damien Gore teaches Natural Hazards at Macquarie University. This is a second-year multi-disciplinary unit that incorporates aspects of Geology, Geomorphology, Atmospheric Science, Risk Analysis and Social Science. During 1998, Natural Hazards was taught for the first time completely through WebCT and offered flexibly for on- and off-campus students.

Student feedback indicates that the large majority are strongly in favour of computer-facilitated learning, and Damien believes that Natural Hazards is more vibrant and relevant as a result, e.g. JavaScript calculators are used for fire risk calculation that are the same as those used by professional bush fire fighters.

Existing resource materials were sought out. Where found, copyright was often an issue and it appeared easier and cheaper to develop material anew. In several cases colleagues were very helpful and friendly, donating JavaScript calculators and images for the unit. In one case, a professional photographer donated more than 100 photographs of hazards for the unit.

Of course, all of the ‘free’ resources were provided on the basis that they were to be used for non-profit purposes. Because the University Library holds copyrighted materials, much of the searching was online and through colleagues known to us or identified from the Web.

The unit is password-protected, because material has been built in that has been obtained free of royalty, and there are problems with open access to this material.

5.4 Summary and recommendations

Under the policy theme we have examined specific institutional policies, such as equity and intellectual property, the alignment of policy throughout the organisation, the direction of policy change (bottom-up or top-down) and a number of strategic processes which flowed on from policies such as grant schemes.

There were common policy concerns across all institutions. These were:

- administrative processes;
- equity issues;
- funding;
- staff recognition and rewards; and
• intellectual property issues, including IP developed as part of employment, barriers caused by IP policy, IP belonging to others, IP considerations in customisation of CFL resources, and legislative issues.

Some recommendations, especially with respect to intellectual property issues, are:

• Safety-net policies need to be continued, and maybe increased, in order to address the specific needs of the minority who cannot gain access to computing equipment for equity reasons.

• Funding schemes need to learn from earlier initiatives; mechanisms for monitoring initiatives and capturing experience are needed.

• Funding schemes need to explicitly take account of the need for ongoing maintenance of CFL developments.

• Appropriate development of criteria for teaching performance could be an effective incentive for staff to adopt CFL materials and practices. The emphasis must be on educational excellence, not on technology per se.

• University staff need access to a centralised service which provides practical support to staff on IP and licensing issues.

• There needs to be widespread dissemination of the legal situation with respect to online IP.

• Mechanisms are needed to facilitate copyright clearance of CFL materials (if it is allowed to be shared) so that due recognition is given to the originator.

• Legislation relating to the use of online resources in education, the ownership of copyright on materials used in offshore courses, and moral rights is in train. Appropriate legislation should be supported.
6 Culture

6.1 Introduction

Culture emerged as a major theme from the case studies and analyses. Some of the issues relevant to it include: institutional strategic vision and leadership, attitudes to CFL and innovation, level of risk taking, allocation of resources, recognition and reward, and staff motivation. These will be addressed below taking the case studies, members’ survey, literature and climate into consideration while developing a set of factors that motivate staff to adopt CFL.

Universities were traditionally thought to be very different from other organisations. However, in recent times, the changes brought about by funding cuts leading to a policy of competition; increased student numbers, diversity and expectations; globalisation of courses and the use of communications technology have forced them to restructure and look at new ways of operating and providing effective teaching and learning.

It has long been noted (Denison 1990; Ramsden 1998) that the culture of any organisation has a direct impact on its performance and effectiveness; the internalised values and staff attitudes in an organisation shape the way individuals and groups operate. Culture is about values and attitudes held by the organisation and are created and fostered by the leaders and managers over time. Schein (1985) described leadership and culture as being like two sides of a coin and must go hand in hand. Leadership in the changing university setting approaching the 21st century, is an extremely difficult task and requires investigation into ways in which administration, teaching and learning, and research can be enhanced and streamlined with the help of technology. A good leader must also provide a vision, empower staff, allow intellectual stimulation and individual consideration, and communicate well with staff—quite a task in the current climate.

Ramsden (1998) wrote about the effectiveness of universities and noted the outcomes of current issues, including the changing nature of academic work, on teaching and learning. He noted that most academics were relatively satisfied with their work but were ‘increasingly dispirited, demoralised, and alienated from their organisations’ (p. 29). He then asks how the environment can be improved for better outcomes. The answers appear to lie within the institutional culture and the need for a supportive climate that values collaboration, consultation, feedback and creativity. Effective academic
leadership is about having a positive vision, coupled with appropriate infrastructure and development opportunities, enabling staff to continue to learn and overcome the hurdles that constant change creates.

6.2 The case studies, surveys and culture

The case studies showed a great difference in the organisational cultures of the universities studied and of the infrastructures set up to nurture, develop, deliver and support CFL. The culture of the universities tended to follow the type of university selected as method of operation, size, location and history were all important influences. The climate of the organisation is made up factors such as:

- strategic vision and leadership;
- attitudes to risk taking and innovation in teaching and learning;
- attitudes to adopting CFL;
- allocation of resources; and
- staff recognition and reward.

Each of these factors is important in determining the success of a university’s staff in the use of technology for teaching and learning. This report is focused on how best to make information about CFL resources available to the higher education sector, but we need to stress that university staff will only search for new resources to use in their teaching when the institutional climate they are in supports the use of new ideas and technologies.

6.2.1 Strategic vision and leadership

Strong leadership and articulation of a vision for effective teaching and learning was regarded as crucial by all institutions studied. The effective implementation of this vision to include appropriate policies, infrastructure and ongoing support was also imperative to meet long term goals. The more advanced universities in adoption of CFL felt that a quality approach could incorporate the best of traditional teaching and learning practices and the best that technology could offer. These universities were at the stage of embedding online teaching as core business. These were often the universities that had a strong distance education foundation and thus the adoption of a new system was not seen as difficult. Here effective innovations by early adopters at the coalface had moved beyond the bottom-up approach and had triggered the top-down approach supported by the institution. However, one factor which emerged in all cases was the acknowledgment by staff at the coalface that
innovation should continue to be supported so that the institution would not lag behind in further creative development.

In the large Established University and the large Multi-campus University of Technology it was felt that the bottom-up innovations were still separate from the newly adopted top-down approach. There was a need to spread the vision more widely and more thoroughly, particularly at the Dean and Head of School levels. The culture change should embrace all levels of management so that staff within academic units feel supported by committed leaders.

### 6.2.2 Attitudes to risk taking and innovation

Institutions which had supported risk taking and innovation and were prepared to move strategically in directions that showed effective learning outcomes had more positive staff attitudes than those which did not support innovation. Institutions with a large distance education culture and infrastructure were able to move directly to a well-supported, top-down approach. Staff at these universities immediately saw the benefits of giving external students access to the same resources as internal students and actively encouraged interaction between the two groups—something that had been almost impossible to achieve without technology.

> Technology is demonstrating that divisions between on/off campus students, and full-time/part-time subjects are artificial...

One university with an enterprise culture had allowed innovators to engage in new, even risky projects where it had seen it as ‘informed risk taking’, and where leadership had a pro-innovation stance. This alignment between bottom-up and top-down approaches towards innovation seems to have struck the right balance in this instance.

Another generic issue that arose was that academics seem reluctant to admit failures (or to pursue unexpected outcomes) in teaching and learning even though they are trying to make improvements all the time. This hesitation was at odds with the willingness of researchers to admit failure and still publish the results. Grant recipients were reticent about admitting problems and felt that this worked against informal collaboration in improving teaching and learning. An excellent scheme of formal mentoring in the Established University enabled recipients of institutional grants to feel strongly supported. Informal mentoring was also acknowledged as an important part of any move towards systematic adoption of CFL. A culture that acknowledged successes and failures would encourage staff to publish and learn from each other.

The ASCILITE members' survey showed interesting data about the perceptions innovators or early adopters have about their colleagues. Most of the
73 members surveyed regarded themselves as innovators or early adopters (figure 6.1) and many had developed significant projects single-handedly with little support from faculties or their university. These members were able to see the need for a well-supported environment for development. They were asked to categorise themselves on the scale:

- innovators
- early adopters
- users when technology is mainstream
- very reluctant users

We also asked them to consider where the majority of staff in each category of department/ faculty/ university were on this scale. The results are shown in Figure 6.2. The data from the survey was in four categories; the data has been collapsed into two categories—innovators/ adopters and users/ reluctant users in order to see trends more clearly. It is striking how isolated in many ways these innovator/ early adopters are. The majority of respondent ASCILITE members considered themselves to be innovators or early adopters while they perceived that the majority of staff at their institutions only used technology when it was mainstream or were very reluctant users.

Figure 6.1 Schematic diagram of phases of technology take-up (after Rogers 1995)
6.2.3 Attitudes to adopting CFL

Universities using distance education were keen to add value to existing student provisions and were already familiar with the long development times for distance materials, and so were more resigned to them than staff teaching internally who saw production deadlines as inflexible. However online teaching itself was seen as offering greater flexibility and quality for class management and communication. One distance education provider noted that online teaching allowed students to manage their learning more effectively with resources and systematic information at their fingertips.

Staff from areas without this insight tended to hold negative attitudes towards online teaching and felt that they needed more support and evidence of its worth. Recent evaluations of CFL approaches can provide the evidence necessary to convince late adopters and staff opposing take-up, but pressure from other staff and students to adopt CFL was seen as a negative factor in take-up. Many late adopters were not comfortable with the technology and required well thought out support and development to make the change.

Housego (1998, p. 355) has reported that the use of multiple strategies to support staff adopting CFL in their teaching at the University of Technology Sydney has allowed barriers to adoption to be overcome. These included one-to-one exploratory sessions through to faculty forums. Here staff feel comfortable undergoing development at levels appropriate to their understanding of CFL, especially when the sessions are set within the context of the university promoting the successful use of flexible learning.
6.2.4 Staff recognition and reward

All interviewed staff at the universities studied felt that the nexus between teaching and research was unresolved that this required immediate attention at university executive level. Many staff feel that research is still more highly valued than teaching and so feel a conflict when asked or expected to spend considerable time in learning to use technology in teaching. Also, most staff did not feel confident that effective and workable solutions to resolve this conflict could be achieved in the short term.

The following suggestions were made as to how this could be resolved:

- use of teaching portfolios for promotion;
- clearly articulated criteria for promotion on teaching;
- an explicit reward structure for CFL implementation;
- effective evaluation strategies for staff using CFL; and
- encouragement for writing papers on the use of CFL.

All of these strategies are used at Australian universities. But the overall balance point is still in favour of classical research. Clearly this is an important issue which cannot be ignored. Suitable resolution will pave the way for active staff involvement.

6.2.5 Allocation of resources

Some universities studied had internal grant schemes which had contributed to a culture of support for innovation and excellence in teaching and learning. These schemes had initially rewarded the early adopters and innovators and were seen as an excellent starting point for change. However, the grants were often seen as short term and did not fund the embedding and maintenance of the innovation. Management argued that ongoing maintenance was the role of central infrastructure predetermined by the strategic planning process. But it seems that until these plans recognised such needs, a long term commitment did not eventuate. Strategic plans also needed to incorporate major changes to teaching and learning approaches and it seems that here the large distance education providers were at an advantage because these universities already had a culture and suitable infrastructure for supporting staff and students in effective learning practices. Underwood, Gamble and Jones (1997) has stressed that the distance education model with central support is an excellent one for universities moving to a systems approach of CFL.

An issue that arose within one case study faculty where the use of technology has increased as a result of grants, was the division between the ‘haves and
havenots’. This growing division between the two groups was mitigating against an inclusive culture encouraging acceptance of CFL to improve the quality of learning outcomes. Grants have been seen as a facilitator for the take-up of learning with technology but other methods to promote general mainstreaming effectively are also required it seems.

### 6.3 Summary of motivation factors

Factors that motivated staff to adopt CFL did not vary greatly in the case study institutions studied. Institutions with large numbers of early adopters had often made changes to their policies, had well-supported infrastructure, and this resulted in a culture with a higher level of acceptance of CFL to the extent that some of the issues were less relevant to them.

Notwithstanding this, across all the case study institutions, participants reported that the main barriers to take-up were:

- lack of knowledge about CFL;
- lack of academic time release;
- pressure to keep up the research quantum;
- non-recognition of teaching;
- lack of funding to maintain programs, staff and technical infrastructure; and
- lack of student acceptance of the new approaches.

One university reported that despite perceptions that the use of CFL was being driven by bureaucracy, CFL was, in fact, revolutionising teaching. Brick, d'Arдон and Robson (1998, p. 95) reported that development of CFL has the capacity to 'stimulate more individualised teaching and learning by the staff and students... and ... to spawn new ways of learning previously unobtainable'.

The study found that the factors that would motivate staff to use CFL included the following:

- a university culture to support the new approaches;
- good leadership from academic managers;
- recognition of teaching on an equal basis as research;
- appropriate support infrastructures for staff and students;
- workload adjustments to develop materials and become computer literate;
- the opportunity to think about learning and not teaching;
- evaluation studies showing improvements in student learning;
- improving learning opportunities and outcomes for distance students;
• adding value to existing courses;
• providing a means to offer courses offshore;
• the chance to interact more with students;
• positive feedback from students;
• solutions to problems of large classes and funding cuts;
• support and sponsorship from mentors; and
• peer pressure.

This list offers very useful insights about staff motivation, within the premise that supportive cultures and infrastructures are essential for successful use of CFL.

6.4 Conclusion and recommendations

Changing educational practices and styles can produce many negative reactions and this negativity needs to be acknowledged and managed effectively. Change should be introduced and implemented within a supportive environment. The culture of the organisation needs to be able to embrace change while offering staff opportunities to manage their own levels of comfort with the change.

Within the university environment, leaders need to develop vision statements that are clear and well articulated to the staff. Appropriate levels of infrastructure and support should be part of the policy formulation to match the vision.

From this chapter the following recommendations are made:

• Universities need to have a clearly articulated vision about the desired approaches to the teaching and learning environment that CFL approaches can facilitate.
• This vision should have ownership and commitment from all levels of management.
• The Dean or Head of Department/School should lead and support the academic unit moves into CFL.
• Policies developed from the vision should include positive values and well funded infrastructure to support staff and students.
• Issues of staff workloads in the changeover to use of CFL should be clarified. Agreements about workload need to be explicit and specific.
• The nexus between teaching and research needs to be resolved so that staff gain appropriate recognition and opportunities for career advancement through innovative work in CFL.
7 Support for the use of computer-facilitated learning

The theme of support for the use of computer-facilitated learning will be explored in this chapter. Unless adequate support is available, academic staff will not seek and use information about CFL resources. Data from the case studies and vignettes of academics’ experience will be used to explore a variety of support areas. We have highlighted the issues that the participants in this study considered to be most important.

7.1 Administrative and institutional support systems

Universities now recognise that the use of CFL resources and systems is of strategic importance and that this means that administrative processes and systems need to change. New systems include upgrading IT networks, building online student enrolment systems, providing online student learning systems, upgrading student record systems, acquiring new financial reporting systems, etc. Most universities are working on several of these large systems concurrently.

The Established University has allocated substantial resources to the development of an extensive IT network and infrastructure. In addition, the faculty has enhanced its overall IT capability; in particular, it has set up multimedia laboratories and extended/ upgraded departmental/ faculty local area networks. The faculty also works closely with the Library and the other educational and professional support services on campus.

The Urban Distance Education University has built a comprehensive institutional infrastructure to enhance the development and delivery of technology-supported learning programs for off-campus students. The university’s status as a distance education university has led to substantial institutional capacity to produce and distribute a variety of educational and communication media, including print, video and sound. In addition, however, some schools have also developed their own specialised expertise, facilities and capacity to supplement or to meet their particular needs or opportunities. One division had committed quality funds to a facility and staff to assist people in the division explore possibilities of using the new technologies. There has been a need to re-assess some of the conventional distance education processes and this transition has created some challenges, for example, where some staff question what they perceive as unnecessarily
centralised procedures. Notwithstanding these frustrations, a number of senior managers pointed out the significant gains made by the university particularly with respect to a major commitment to extending the IT infrastructure, making it up-to-date, well maintained and reliable. Examples included: putting all academic staff and students into the one email system, building a student-focused data warehouse and establishing a university-wide technical framework for online learning.

At the Urban Distance Education University, administrative and staff development and training support systems have been established at the institutional level. A number of these are being restructured or reviewed in response to the newly emerging educational needs. Much of the experience of those working at the project level with offshore agents highlights the issues which are confronting the university at an institutional level. An administrative support person working on one of the projects pointed out some of the challenges of working in an ‘extended’ administrative support structure with university systems and offshore agents. Issues include:

- duplication of tasks and standardisation of procedures and software systems;
- implications of working in different time zones;
- different teaching periods and student intakes between the program and the university semesters; and
- communication misunderstandings, sometimes based on cultural differences.

There were some problems working with other administrative areas of the university—…but they are beginning to understand our needs and to be more accommodating, and sometimes we have changed our programs.

In summary, there is a belief that real efficiencies could be possible with supportive infrastructure. In particular, there is a strong push in many institutions for developing offshore teaching as a strategic initiative, though institutions are still unclear how best to manage this. At all institutions, the changes to administrative and institutional support systems are complex and take time.

### 7.2 Funding

The issues relating to funding are complex. The investment for systems change in Australian universities has been noted in chapter 3. In chapter 5, a number of key issues surrounding funding were discussed, including the need for funding policies to cover monitoring and evaluation, and to provide for...
ongoing maintenance of CFL developments. Here we focus primarily on funding for courseware development and delivery.

7.2.1 The central/devolved funding debate

A major issue is whether university funding for CFL should be through central or faculty-based processes. There are many tensions in the central/devolved debate. Faculty staff want the skills and expertise that exists in central units, but wish to have it provided without reduction in funding to faculties. The requirement to pay for services from central units can set up resistances. As noted in chapter 3, most universities use both approaches. It is finding the appropriate balance point that is the challenge. Table 7.1 summarises the arguments for and issues associated with each approach.

Table 7.1: Pros and cons for centralised and devolved funding

<table>
<thead>
<tr>
<th>Centralised funding</th>
<th>Devolved funding</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Points in favour of:</strong></td>
<td><strong>Issues associated with:</strong></td>
</tr>
<tr>
<td>Can reduce duplication of expensive services by funding a range of projects, the design ideas and products of which can be used in other faculties.</td>
<td>If the funding committee is not broadly constituted, this can result in a restricted range of models being favoured. Can be dominated by a few strong university personalities; this may disadvantage certain faculties.</td>
</tr>
<tr>
<td>Can foster cross-faculty collaboration and communication.</td>
<td>Can develop stable ongoing teams for future developments. Can source funding from discipline and industry-related bodies.</td>
</tr>
<tr>
<td>Can allow university strategic priorities to be enacted.</td>
<td>Can allow local ownership and commitment to grow.</td>
</tr>
<tr>
<td>Can foster the integration of outside funding with university priorities.</td>
<td>Traditional practices in the discipline can dominate, and it may be difficult for some innovative projects to be funded. Can be dominated by a few strong faculty personalities; this may disadvantage certain departments/schools.</td>
</tr>
</tbody>
</table>

Two examples from the case studies illustrate the tensions. At the Multi-campus University of Technology, the user-pays policy of central support services has proved to be a bigger issue in the case faculty than, say, lack of funds. Several staff displayed a degree of hostility about this in the sense that if the university sees use of CFL as essential or core business, then forcing faculties to pay for it is counterproductive.

At the Established University faculty studied, there is a faculty multimedia unit but major courseware development funding comes from central or external sources and this creates some tensions about autonomy and control.
7.2.2 Hardware and facilities costs

There is also a need to consider the costs of facilities, computer labs, space, furniture, as well as the number and level of staff computers. Huge investments are needed in some universities; this was mentioned in all case studies. The fluid state of the data available about university computer ownership was mentioned in chapter 3, p. 25.

In many ways this is another manifestation of the centralised/ devolved debate. We will consider the issue of student computer laboratories as an example. Table 7.2 outlines summarises the arguments for and issues associated with focusing the management of student computer laboratories at university or local level.

Table 7.2 Pros and cons for centralised and devolved management of student computer laboratories

<table>
<thead>
<tr>
<th>Central university control</th>
<th>Faculty control</th>
<th>Department/ school control</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Points in favour of:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Supports equity principles in that all students can access.</td>
<td>Provides access for the entire faculty.</td>
<td>Special needs of students can be known and accommodated more readily.</td>
</tr>
<tr>
<td>University standards for level of machine can be adhered to.</td>
<td>Some overall discipline customisation in choice of machine and software possible.</td>
<td>Machines can be customised to suit individual subject needs.</td>
</tr>
<tr>
<td>University bulk purchasing or leasing easier.</td>
<td>Machines can be ordered to suit discipline needs but this may be more costly.</td>
<td>Machines can be ordered to suit discipline needs but this may be more costly.</td>
</tr>
<tr>
<td>Development of policy about 24 hour access (e.g. through a smart card) may be easier.</td>
<td>Local laboratories can foster student work in teams on projects.</td>
<td>Local laboratories can foster student work in teams on projects.</td>
</tr>
<tr>
<td><strong>Issues associated with:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>The software and configurations cannot be specialised at all for particular disciplines.</td>
<td>Expense of customisation and maintenance.</td>
<td>Expense of customisation and maintenance.</td>
</tr>
</tbody>
</table>

Better coordination between central and local facilities needs to occur. Access hours have been an issue but many universities have introduced, or are planning to introduce, 24-hour access through the use of smart card technology.

Some of these tensions are seen at a major professional faculty at the Established University, considerable emphasis has recently been put on improving computer laboratory capacity within the faculty. The point was made by several interviewees that, in earlier years, central laboratories had
proven unworkable from an access point of view, so some departments had put considerable resources into establishing their own facilities. This greatly improved efficiencies for teaching and learning and removed earlier barriers in terms of promoting widespread adoption of CFL use throughout the department. One departmental head pointed out that equity problems for students had been removed because there were now sufficient laboratories for the students. Good access to laboratories is not enjoyed by all departments within the faculty, however, and for one school in particular, there is a serious problem in terms of enabling students to continue to use resources developed in previous years.

7.2.3 Institutional development grants

School staff at the Single Campus University of Technology felt that the existence of discrete grants divided staff into two groups—those who do it by themselves on shoestring budgets, and those who get grants. At the Multi-campus University of Technology there was an appreciation by some that this was an important part of overall institutional support, but others articulated underlying problems with the principle behind the grants. These concerns included:

- The success of a project is often to do with the amount of funding provided by the grant, rather than the inherent worth of the project.
- Grants are very competitive—they are about promotion, and big innovations to showcase.
- Schemes are very ‘outcome/ product-oriented’. ‘You must guarantee you are going to use the program in your courses, even if by the end of the development you might feel you have discovered a better way to do it.’
- There are missed opportunities to tell others about the ‘failures’, so they can avoid doing the same thing. The grant scheme should track the failures so they don’t fund the same thing again. In other words it appears there has been too much invested in the development of the product to change course or to report unexpected, or less favourable results.

  Grants are often self-serving—I’ve never seen an outcome of grant that says ‘...this was completely bad, this didn’t work’. They are out to sell it and it becomes a product of the university which sees the opportunity to license and raise revenue.

Staff at several universities commented that the funding levels of grants are never adequate. The sector should not rely on staff working nights and weekends, as is generally the case with CFL development projects. Funding is low compared to corporate or IMM industry levels, and this issue needs to be examined carefully. At the Established University $7–8 million over three years
has been allocated for CFL development projects. While good initial products have resulted (some as a result of CAUT/ CUTSD funding as well as university funding), it is really too early to tell how these products are impacting on the adoption of CFL overall. Also, while this figure is substantial, relatively speaking, within the higher education sector, a senior staff member indicated that by industry standards it was not particularly high. This situation meant that universities would continue to be relegated to amateur status in broader industry circles.

The strategy employed by the Established University has been to provide funds to stimulate development and use of IT specifically through supporting academic input, but excluding costs for facilities, space, etc. Furthermore, ongoing support and maintenance remain the responsibility of faculties and schools. There is concern about the dependence of faculty and department/school multimedia units on grant money, especially in relation to staff costs, which depend on this grant money.

People often try to fit this sort of thing (development and use of CFL) in as an add-on rather than in place of—that can be because we, as heads of departments, don’t resource it properly.

One other cost which was mentioned was that of maintaining and updating CFL materials. They have a finite shelf life. Content changes, e.g. new scientific discoveries and theories, changes occurring in the law, represent one aspect. Changes in the technology is another; for example, the development of hybrid web-CD-Rom systems to utilise the media intensity of traditional multimedia in the flexible environment of the web. The need for constant evaluation and updating was mentioned as an important part of quality assurance processes which are vital for maintaining a competitive edge (see chapter 8).

The ‘one-off’ project model is no longer adequate. Funding for CFL development and maintenance needs to be adequately scoped and built into university (central and faculty) budgeting processes.

7.2.4 Staffing costs

Most universities acknowledge the need for staff who can develop and maintain computer-based systems and for staff who can assist in the development of CFL materials. Staff in several universities are concerned about keeping skilled technical staff in the university because salaries are higher outside the higher education sector.

One major cost that was noted by both distance education universities in the case studies was the cost of skilled staff who can facilitate online teaching.
effectively. Managing and supporting online learning is a highly skilled task and is not likely to be effective if relatively unskilled and inexperienced university tutors handle the bulk of the interactions with students. The hope of cost savings with online teaching and learning may be realised, but the equations cannot be made by including low cost tutors.

Of course, many skilled and experienced university teachers are neither skilled nor experienced in online modes of operation. The needs for staff development are discussed below. They do represent a substantial staffing cost, both in terms of staff who organise and facilitate professional development programs, and in terms of the time of the staff who attend and develop their skills. Hughes, Hewson and Nightingale (1997) discuss the changing roles of university staff, noting that the roles of academic and general staff change in parallel.

It was noted by staff at the Established University that there is a general expectation that staff who receive grants will assist in staff development in their own faculty, but this has not always happened. This may need to be made more explicit in grant arrangements.

7.2.5 Ephemeral nature of funding

Staff at both the Established University and the Single Campus University of Technology expressed concerns about the ephemeral nature of funding. At the Established University the concern related to future funding arrangements. Things are relatively good at present, but some staff were concerned about what would happen when the current three-year grant scheme is finished.

At the Single-campus University of Technology, there was a feeling the school and university had led the way in the early 90s, but had slipped back, and was no longer producing quality CFL. There were a number of examples mentioned of learning packages developed by the school and funded by external sources (CAUT, CUTSD). However, these were not being upgraded and many felt that the use of the web meant less focus on individual stand-alone programs. Currently, funding levels are lower than previously and there are fewer support staff.

7.2.6 Key issues in funding for courseware development and delivery

The funding discussion above centres around four key issues:

- each university finding an appropriate balance point for the central/devolved debate;
• providing ongoing support for maintenance and further development of CFL resources;
• developing more integrated models of funding which remove the focus from ‘one-off’ project funding; and
• identifying the staff skills needed, providing appropriate staff development and building these costs into planning.

7.3 Technical support from information technology services units

7.3.1 Diversity of roles of ITS staff

Some of the issues highlighted by this project are the increased work load carried by ITS units. This includes:

• maintenance of IT networks; this may involve extensive recabling;
• selecting appropriate servers; issues of capacity, stability, suitability for media and servicing are important. Negotiating a policy for supporting faculty and central servers is also becoming increasingly important;
• choosing and maintaining the software used for main administrative and institutional systems. As noted above, this includes student enrolment systems, online student learning systems, student record systems and new financial reporting systems;
• preparing specifications for the scalability of the use of new systems. The issue of scalability is not only in terms of systems infrastructure and hardware, but in also in terms of support staff. Having a few projects is one thing; having an expectation that the majority of staff will use technology is another issue with substantial resource implications;
• setting standards for central computer laboratories. The maintenance and management of these central facilities may also be by ITS staff;
• arranging licencing agreements for software; and
• arranging purchasing and leasing agreements for computers.

In the increasing role that ITS staff have in the support of online learning systems there are cultural issues to negotiate. IT support staff have expertise; academic staff have educational ideas. These need to connect well together. Issues of culture, ownership, and effective project management, need to be considered. There is often a problem when IT staff and academic staff do not understand the needs and understandings of each other. Negotiating cultural boundaries to form effective teams is essential (Alexander et al. 1998).
For example, at the Regional Distance Education University, the objective of the IT division is firmly focused on supporting online teaching, within guidelines of what can be delivered reliably and on a large scale. As is the case with all other institutions, IT and technical service areas are under enormous pressure to keep up with demand, and ongoing staffing shortages are straining their capacity to meet their client expectations. Generally, the other professional and support areas recognise the importance of good technical and IT service, but not all are fully appreciative of the resourcing and other issues at work in central areas. IT-related concerns raised by staff, and not necessarily seen as the responsibility of the IT division were:

- the inadequacy of some staff computers (and no available funds in schools to upgrade them);
- small campuses that do not have much infrastructure; and
- telecommunication difficulties of a university located in a regional area with students in even more remote areas.

### 7.4 Support from libraries

In Chapter 3, the key role of university libraries in information literacy development was noted. The survey data described in chapter 3 indicated that libraries provide key support in online searching for resources but few maintain any catalogues of CFL resources. While internal collaborative projects between library staff and academic colleagues are common, there is little external collaboration at this stage to acquire or share CFL resources.

In the case studies, the university libraries were mentioned as being important in the provision of information and in providing professional development for staff and students. The following two vignettes illustrate this.
Dave Ritchie, from the School of Public Health at Charles Sturt University, has developed a program in health services management which is only offered by distance education to health service professionals presently employed within the health sector, and with a minimum of three years experience.

Support from the Library was involved. The base content was already in existence, but was reformatted from a print-based template. Additional electronic links were identified and attached to provide extension for students who were interested. Preliminary evidence suggests very little use was made of these embellishments over and above the access to the forum. Additional resources were largely links to sites that were evaluated for their usefulness rather than to specific electronic documents, with the expectation that sites would be more stable. Suggestions were provided as to what might be sought in the sites—some generic, some specific. Library assistance was used to develop an online tutorial regarding database searching linked to assignment specific topics.

Ayshe Talay-Ongan has developed a flexible learning package for ‘Development, Disability and Difference’ at Macquarie University. The web site contains course information; clearly identified goals and objectives for the unit; a unit outline pacing the learning activities for the semester; weekly lecture outlines; a description of the assessment activities; an extensive reference list for further reading and internet resources; as well as the curriculum content, including tutorial exercises, case studies, self-assessment tasks and vignettes which include the student’s own experiences and reflections. The web site also offered communication facilities.

The unit utilised existing resource materials consisting of two text books, various vignettes and case studies, and assorted samples of assessment tools and policy documents. Searches on the Internet allowed for addition of abstracts of recent pertinent article abstracts and web sites to the weekly tutorial exercises. Students were also urged to find and share other web-based information on the topics presented, and often did so. The Library was involved as an initial training site (IT Training Unit training room) for all students to familiarise them with the unit web site and its proper use, as well as an ongoing base of support with its CD-Rom-based databases.

7.5 Professional development and training

In all universities this is seen as a vitally important area. We should not underestimate the difficulties involved in innovation and change. Marris (1974) parallels the sense of loss during bereavement to the resistance one can feel.
when letting go of known ways of doing things and embarking on new strategies. For many academics the increasing emphasis on the use of computer technology for administration, research and teaching is highly threatening. We need to recognise these fears and devise plans which build staff confidence and motivation, and provide adequate support and training opportunities.

Professional development can no longer be a pleasant ‘cottage industry’ on the fringes of academe or the enthusiastic enterprise of a few individuals supported by ‘soft’ money. Effective staff development is positioned at the centre of university functioning and yet needs to retain connections with the needs and perceptions of teaching staff. This is a demanding challenge. Professional development programs that are successful in meeting the needs of complex modern Australian universities need to be supported strategically (and financially) by their own universities.

Hughes, Hewson and Nightingale (1997) describe three approaches to staff development for the use of information technology in teaching—integrated, parallel and distributed. These approaches are defined and the discussion in Hughes et al. are summarised in Table 7.3. In reality, universities use a combination of approaches, though with a trend in one direction. The table is useful as a tool for assessing the potential strengths and weaknesses of the combination of any particular set of support units in a given university.

As we have pointed out earlier, the number of players in the professional development area is large, including:

- more ‘traditional’ academic development units, concentrating on general teaching and learning support; these can be centrally located or faculties;
- units where the key focus is the use of communication and information technologies in teaching and learning; these can be centrally located or faculties; often they are called flexible learning units;
- units which focus on courseware production using technology; these can be centrally located or faculties; some of these are units which have evolved from print-based distance education units;
- centrally based Information Technology Services units; and
- university libraries.
7.5.1 A complex and multi-faceted area

As an example of how wide-reaching the professional development needs are seen to be we will describe the roles staff development is seen as playing at the Multi-campus University of Technology. Staff felt they needed to address the following issues:

Table 7.3 Integrated, parallel and distributed approaches to staff development for the use of information technology in teaching (after Hughes, Hewson and Nightingale 1997)

<table>
<thead>
<tr>
<th>Integrated Approach</th>
<th>Benefits:</th>
<th>Issues raised by:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strong structural links between units or section of the one unit which provide general T&amp;L support, support for using IT in T&amp;L, and production support for courseware. Essentially top-down.</td>
<td>Coherent policy framework.</td>
<td>Ease of access by all staff limited.</td>
</tr>
<tr>
<td></td>
<td>Efficient planning of resources and avoidance of duplication.</td>
<td>Individual approaches less likely to be recognised.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>An emphasis on one technological solution may emerge and overwhelm educational design.</td>
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</tbody>
</table>

<table>
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<tr>
<th>Parallel approach</th>
<th>Benefits:</th>
<th>Issues raised by:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Separate units for general T&amp;L support and support for using IT in T&amp;L.</td>
<td>Allows due recognition to be given to a wide range of T&amp;L issues (e.g. internationalisation) and not just educational design associated with the use of IT.</td>
<td>Cooperation between the various units may be difficult to achieve. There is a potential for confusion and competition to emerge.</td>
</tr>
<tr>
<td></td>
<td>Allows the development of expertise relating to the new technologies.</td>
<td>May result in a narrow range of educational issues being addressed in the IT in T&amp;L units.</td>
</tr>
</tbody>
</table>

<table>
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<tr>
<th>Distributed approach</th>
<th>Benefits:</th>
<th>Issues raised by:</th>
</tr>
</thead>
<tbody>
<tr>
<td>More bottom-up than the other two approaches. A range of units, centrally located and in faculties which are not tightly coordinated. Project management remains with local projects.</td>
<td>An ‘organic’ solution where unnecessary controls do not hamper innovation.</td>
<td>Can result in weak project management where there may be insufficient educational expertise.</td>
</tr>
<tr>
<td></td>
<td>Can be economical as skills are sought</td>
<td>Potential for innovations to falter with out visible institutional support.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Can result in waste and duplication of effort and resources, including equipment.</td>
</tr>
</tbody>
</table>
• technological literacy for staff

There is widespread recognition that a number of staff are ‘still frightened' by technology and there are some who still don’t use it. It represents a steep learning curve for some, and a barrier to take-up in the sense that people need blocks of time to come to grips with IT and to reflect on how they might use it effectively.

• ways to encourage collaborative or team approaches to developing or using IT

This faculty already has a strong team-teaching culture, but that this needs to be translated into exploring uses of IT in teaching.

• the re-conceptualisation of the role of the teacher as an inclusive and positive process

There was some concern from lecturers that students are misconstruing the role of the lecturer in the context of ‘student-centred'. Some students, they report, feel that if the lecturer is not standing up in front of them, then she or he is not doing a good job.

• nature of training

There was a generally accepted impression about current training offerings—that the type of training offered was often inappropriate, at the wrong time and out of context. A number of staff favoured small ‘local' workshops within the school or faculty. One member of staff commented that she had been to lots of training sessions, but still was not confident about the skills because she didn’t have time to practise them. Also a number of staff reported a lack of coordination between training offerings.

These concerns were echoed in several other institutions. At the Established University, all staff are expected to adopt a modern use of IT techniques, particularly in terms of communication, to enhance their teaching. This is seen as non-negotiable. Increasingly, the range of technologies staff will have access to, and might be expected to use at some level, will increase.

As a senior staff member at the Urban Distance Education University commented:

If there is any unwillingness on the part of the staff, it's because they lack skills and they don't have the time in their life. … An academic staff member has to learn technical skills—how to operate and work technology—you never have an understanding of what's possible unless you learn how to do it yourself.
At the Urban Distance Education University, one successful program was the seminars and workshops conducted each month so non-adopters might be motivated by stories of success by others.

At the Established University there was a recognition of the importance of aligning development and training programs to the level of the people who are doing them. As the faculty is aiming to involve the majority of academic staff in CFL approaches, then many of the training activities must be appropriate for later adopters, rather than enthusiasts and innovators.

*I think importantly, with staff development you actually have to focus it at the level of the people who are going to do it. You can’t expect academic staff to be IT technocrats. I think a lot of staff are worried that that is what is expected.*

There was also an awareness that some staff resist these changes; they are not excited by or supportive of IT and see it as basically interfering with their research time. For these few, it may well be that development and training activities will not alter their position.

### 7.5.2 Need for high quality staff developers

The requirements for staff who are effective in professional support and resource roles are very high. Staff developers need to:

- understand the technology;
- understand the general needs of a learning environment;
- have a general empathy with the nature of a wide range of disciplines;
- be able to communicate well; and
- be good team players.

A suite of integrated services may be the most pragmatic solution to the wide range of skills needed.

For example, at the Established University, the faculty studied has considerable access to professional and support staff expertise and services through:

- the faculty multimedia unit;
- other departmental development units; and
- institution-wide services provided through a university multimedia unit and a central academic development unit.

In particular, the faculty multimedia unit has a role to facilitate widespread integration of multimedia and other CFL approaches into teaching and
learning within the faculty. The staff provide more than a technical or
development service, as they work with other ‘key stakeholders in the change
process’, to bring about an evolutionary new cultural perspective on the use
of information and computer technologies within the faculty. The faculty
multimedia unit also plays a brokering role with respect to the specialised
services and expertise resident with other faculty and institutional service
areas, for example, with the central production support units which have
expertise and facilities in graphic design, video production and digital image
capture, and programming.

The Regional Distance Education University recognises the need for ongoing
training to apply equally to professional, technical and support staff, as well
as to academic staff. There are additional problems with technical training for
regional universities as well. Staff training and development is provided by a
central support unit and the ITS unit. The library also runs sessions on how to
navigate online and find information, use search engines, email, etc.

7.5.3 Need for flexible support programs

Effective staff development needs to be flexibly organised. Staff need to get
advice and support for issues as they arise; for example, management
strategies for using email will be popular once the need is experienced
through a flooded mail box.

Several universities are developing staff development resources, both in print
and online (e.g. Collings & Walker 1997; Murphy, Jamieson & Webster 1998).
This trend is likely to continue, especially in the development of online
resources.

There are inefficiencies when staff don’t understand the technology because it
takes longer to do things. This is especially true when manipulation of media
elements are involved. These are critical times and support needs to be
available so that an imaginative use of technology is not relegated to the too-
hard basket.

At the Regional Distance Education University, a number of comments were
made which suggested that staff needed more than formal training if they
were to successfully make the transition from traditional (distance education
or face-to-face) to online teaching modes. It was felt that professional
development was probably adequate for those who are interested, but less so
for the majority of staff and especially for non-technology adopters. This was
backed up by a later adopter.

    I am a phobic about technology; I loathe it even though I use my
    computer constantly (listed other functions). I’m only interested in the
computer as a functional tool. I find learning how to use the computer in different ways quite anxiety provoking—I won’t initiate, I won’t be in here on the weekend thinking ‘Oh goody I’m just going to see how this works’. I will want somebody to actually talk me through and show me how to use it. Once I’ve been shown I’m usually OK, provided there is back-up support. I’d like the professional support person to do two things—run small class groups for phobics like me and really talk them through it, and then be on call to help if needed. I need plentiful support until I’m up to speed.

Department/school heads need professional development as well. At the Established University one interviewee highlighted the special needs of senior academics, administrators and heads of department for professional development in matters such as guiding staff on how to be explicit about their teaching or multimedia achievements for promotion, acquiring a better understanding of teaching and learning issues, evaluation of the efficacy of various approaches and so on.

Some universities have a fixed training scheme based on the university’s decisions about which online learning system software it is supporting. Training which is too stringently tailored will not suit the needs of many staff. At one university, the training offered has not met the needs of some staff, particularly those who were looking for something other than the generic university approach. While one might expect some of the innovators to hold such a view, it was also reported by a later adopter. It is important that training is at the right level—staff need to develop an understanding about the technology but wish to avoid unnecessary technical detail.

*It was useless. I didn’t learn one practical thing, too technical. I don’t give a stuff about the hubs—I just want to know how to find the information. The courses are all booked out. They teach you detail that you are not interested in at the time. We need basic competencies—we also need a forum to discuss our attitudes and beliefs—of what technological literacy is all about.*

### 7.5.4 Important role of mentors

The majority of reluctant users are looking for one-to-one assistance but this is normally not practicable. Maybe small support groups at department/school level might be the compromise but even this is expensive. The role of mentors is very important. There are two possible models:

- Bringing in an external mentor for a period of time, long enough to make some impact on practice in the university. Barrit, Ashhurst, Johnston, & Pearson (1995) describe a staff development model using Developers-in-
Residence. The report indicates that this initiative was effective in initiating wide-spread interest in and awareness of the possibilities of technology.

- Developing the mentoring capacity within the university. RMIT University, as part of its IT Alignment Program, has invested heavily in staff development. One of the 1999 strategies is the appointment of 75 Learning Technology Mentors in every department of the university. These academic staff each have one day a week time release to get involved in an online development project and also to provide support to colleagues in their departments. Training in the use of online tools is provided, together with substantial support in educational design and mentoring skills. Staff can use this experience as part credit to a Graduate Certificate in Flexible Learning.

One academic at the Regional Distance Education University made the observation that teaching is traditionally a very private matter, and that academics are typically reticent to expose publicly their shortcomings or need for training. It was felt that fewer general staff seminars were needed and more one-on-one assistance, as well as support from people at ‘a parallel level with academic staff’.

At the Urban Distance Education University, the role of mentors appears to be an effective way of improving the technological literacy skills of staff and, in one example in particular, a project pioneer had provided a very strong model within the school. This willingness to act as a role model and to freely pass on experience and expertise, was recognised and appreciated by the head of school and colleagues alike. Staff who saw themselves ‘working at the coal face’ in online teaching, indicated that they were always looking for ways to find out about colleagues experiences using online systems—what is good and bad about the system.

At the Regional Distance Education University, the central support unit has established a network of faculty online support officers—a team of educational design staff situated in the faculties with the task of assisting academic staff in the development and integration of online learning approaches into their existing teaching practice. The online support officers also provide a liaison role between ITS staff, faculty staff, and to a lesser extent between library staff, in relation to training and staff development.

In addition, the Regional Distance Education University, has created five academic advisory/ liaison positions (fixed term appointments) as a short to medium term strategy to provide additional academic support in the transitionary implementation period of embedding a university-wide online strategy. These positions remain fairly flexible according to the particular needs of the designated school or faculty, but the role includes assessing academic needs, mentorship and advice. These positions are seen as
complementary to the role of the central support unit’s educational designers—in some ways an intermediary role between academic staff and professional support and technical staff.

… there is still a bit of a reticence to talk to non-academics or to be told you shouldn’t do something, or could do it better from a non-academic—it’s a status thing.

It is important to develop a collegial atmosphere of support rather than a training regime. At the Regional Distance Education University one lecturer was keen to see more women (or those who took a very low-key, empathetic training approach) in professional/ support roles. Another indicated that, as a novice, the best approach was to consult widely and get as much as help as possible.

7.5.5 Time for staff development

The time to undergo professional development is a problem. This needs to be recognised as part of the academic workload.

At the Established University, staff time continues to be a major concern and this is recognised by senior academic managers and staff involved in the development and use of multimedia. Another dimension of the problem is the time needed to implement new programs, and evaluate and maintain them. It was argued that if the university was serious about maximising the accruing potential benefit, these concerns should be addressed. A number of those interviewed felt that there were conflicting demands, between time spent on research and the time they could devote to developing and using computers effectively in teaching—they perceived these as two quite different tasks.

*Release time is a major issue here—we are a small school—20 full time people and a bunch of part timers who teach. A key inhibitor is the availability of release time for faculty to do this.*

At the Single-campus University of Technology, the head of school who was interviewed was very concerned with staff workloads (16 hours contact per week) and feared staff would burn out.

7.5.6 Key issues in professional development

We end this section on professional development with the description of the work of one successful unit which provides professional support on the production and use of CFL resources. This vignette encapsulates many of the functions and issues in staff development that have been outlined in this section.
This vignette about the Centre for Flexible Learning at Macquarie University was contributed by David Rich, Peter Love and Maree Gosper. The Centre was established in 1997 with a primary mission to enhance the university’s ability to design, develop and deliver high-quality flexible learning units and programs for on-campus, distance, international, open or continuing education students. It also supports research, community outreach, marketing and administrative activities, particularly by preparing resource materials in all kinds of media.

With the growing use of IT in teaching programs, there was an awareness of the need to develop University-wide support mechanisms that would:

- act as a central repository of ideas and expertise on the appropriate use of IT in teaching, thus avoiding the problem of the continual ‘reinvention of the wheel’ often found in fully decentralised systems;
- develop a central web-based delivery platform for educational programs and students support systems;
- assist teaching staff to choose appropriate technologies and implement good technical and pedagogical practice;
- provide a common interface and delivery software for students;
- design and deliver staff training and support;
- provide quality assurance mechanisms, for example by developing recommended technical and pedagogical standards; and
- provide for continuity of initiatives and reliability of service.

The Centre currently (March 1999) supports the delivery of 62 course units. To support IT-based teaching and learning the Centre has developed:

- the Macquarie University Online Teaching Facility (MUOTF) which provides a hosting and delivery mechanism for Internet-based teaching material, along with administrative support for teachers and documentation for students. The facility is built around WebCT but has additional functionality including an online survey instrument;
- design and production services for developing computer and Internet-based resources;
- technical and pedagogical support and training for staff; and
- student support and training mechanisms. The responsibility for student support and training lies with the academic staff. At Macquarie, the University Library runs an IT support desk for students and the Centre liaises with the support desk to ensure that relevant information about online units and MUOTF is available.

The Centre is proving to be an important change agent in its support of teaching and learning strategies and academic programs in many parts of the University, although again this is far from universal.
Some issues are:

The Centre has some significant achievements to its credit. Nevertheless, some important strategic, resource and operational issues remain to be resolved. Amongst these are the following.

- A crucial question is the issue of scaleability: can it provide escalating services and facilities to support many more programs and units without a pro rata increase in costs?
- Crucial requirements for the Centre are to develop a reputation for quality services and products and to maintain this reputation during the process of escalation.
- There remains an important tension within the University over whether a centralised teaching and learning support service is necessary, particularly at a time of financial cutbacks.
- Ongoing maintenance of flexible and online teaching programs is a crucial and largely unresolved issue. While special funding is often available for initial development work, individual departments are responsible for funding maintenance and updating.
- While, increasingly, the value of the Centre's services is being recognised, the reality is that unit coordinators are ultimately responsible for the teaching and learning that is taking place.
- Historically, teaching innovation has relied on the efforts of enthusiastic individuals. We are rapidly moving beyond this to a phase where the use of IT is increasingly mainstream. This requires a much closer alignment of a department's strategic objectives and teaching innovation than has been common hitherto, raising important questions of academic leadership and management—a major priority in 1999 for the University's Centre for Professional Development.
- Close coordination of the Centre’s responsibilities and activities with those of other support groups is crucial to avoid duplication of effort, conflicting priorities and similar problems. This is particularly important with respect to: the Centre for Professional Development (responsible for professional skills enhancement and broader strategic and curriculum design issues in teaching development), the Centre for Open Education (responsible for traditional forms of teaching delivery to and support of distance students), the Division of Information Services (which operates the central web server on which MUOTF is hosted, and coordinates many other services including provision of online access to administrative and student support, at <http://www.student.mq.edu.au/>); and the University Library (which among other things coordinates IT training for students).
To summarise, the six key issues in professional development voiced in this study are:

- The appropriate balance point between centrally provided and local staff development services needs to be determined in each university. Central services can be more clearly linked to university priorities; faculty or department services can be more in touch with local needs.

- As technology becomes more mainstream, support services need to be scaled up. This involves deciding on the level of support that can be afforded and the model of support which is most apposite. The educational design and evaluation, technical, and media production support services that universities currently have are under strain. It is unlikely that the existing examples of good practice at each university will be sufficient to ensure that new or revised subjects will be well designed and evaluated. By modelling good practice themselves, mentors can assist staff make optimal use of resources.

- A follow-on issue is determining the optimal relationship between staff development and production support services. Again, this needs to be decided in each university context.

- Even if an integrated model of professional development is adopted, there are still many professional development providers at most universities. Mapping the services of each provider and ensuring reasonable coordination is increasingly important as the need for support services scales up.

- Academic and general staff work load is a key issue. Careful work planning to ensure that staff have time to learn new skills and manage new processes is essential.

- We are in a time of rapid change. It is important that professional development support flexible, appropriate and adaptable. There is a need for ongoing research on how best to use technology and this needs to be fed into staff development plans.

…there is still an awful lot of work to be done with staff development—we’ve had online on board for nearly two years and we’ve come a fair way but a lot more serious research needs to be done about how to best use the technology.
7.6 Student support services

In this study we did not interview students about their support needs. However, many staff raised concerns in this area. Issues include:

- equity and access
- access to academic help
- access to technical help and
- access to computers

7.6.1 Equity and access

At Australian universities there is a great diversity of students from varying backgrounds. Baron (1998) discusses issues and strategies involved in teaching online across cultures; cultural norms vary and great care needs to be taken to ensure effective communication.

In addition, distance education students often have access problems to high end technologies. Staff at the Regional Distance Education University are especially concerned by this. Sparrow (1997) looks at some equity projects at Edith Cowan University that were developed to encourage distant education students to use technology positively. In 1992 ECU established a ‘Virtual Campus’. Its aim was to provide an electronic equivalent of some on-campus services. It was soon recognised that providing resources was not enough. Students need to able to obtain the hardware and skills to use those resources. The following strategies were implemented:

- equity scholarships that enabled students to receive a computer;
- a modem loan scheme;
- encouraging the use of TELE-centres; and
- workshops and demonstrations for the Virtual Campus, academic skills and course counselling in remote areas.

7.6.2 Access to academic help

The biggest problem reported by students at the Regional Distance Education University was concern that they could not talk to the appropriate person (e.g. lecturer) when they needed to. It is hoped by a number of staff that the online support will soon be able address this ongoing concern.

At the Multi-campus University of Technology another facet of student support mentioned by a number of faculty staff was the need to assist students with computer (electronic) research skills; the students needed advanced research skills and to get away from the idea that they should be spoonfed using...
course notes and guides. There was a suggestion that computers were exacerbating the ‘passive learner’ syndrome, where they expect to be provided with all the information they need to complete the unit.

Understanding new conventions and ways of working can be a big issue for students in this environment. Students are required to know not only how to do something online (operational) but also what is acceptable practice (online communication protocol) in an online learning environment—how to become part of an online learning community. Academic and support staff reported different approaches to assisting students; incrementally helping students acquire the necessary skills and competencies over a number of subjects was the goal for one group.

### 7.6.3 Access to technical help

Can we assume students have technological literacy? This includes the skills, conceptual understandings and dispositions which enable students to use technology effectively for academic, research and vocational purposes.

At the Multi-campus University of Technology there was considerable comment on student support and skills. There was widespread support for the notion that strategies needed to be developed to address technological literacy for students. Views about the current level of students’ technological literacy represented extreme ends of the spectrum—ranging from ‘technological literacy is a big issue/ a barrier’, ‘students have a lot of difficulty learning Lotus Notes’ to the view that ‘students have no problems at all; they are all IT literate now’.

At the Urban Distance Education University, limited access to computers by some students influenced the way a few of the staff felt about the technology; they felt that as a result you had to make the online interactions too basic, unexciting; they would prefer not to get involved because the technology was still too limiting. One senior academic manager explained that while it was possible technically for a small number of students to receive multimedia and other high-end streamed applications, on a university-wide policy and procedures basis, it couldn’t be supported at this stage.

This view was also echoed at the Regional Distance Education University. At this university student support is a top priority and is built into the online development and delivery of units by lecturers and educational designers. For example, one lecturer emphasised how much support students required when they first begin, and accordingly had produced a video which was sent out to them at the start.
When students first start, technological literacy can be a barrier and they need support—I’m there because it is a steep a learning curve.

A central support unit has a liaison section which handles distance education students’ general needs by phone or online; ITS unit staff look after their technical needs such as connecting into the system.

At the Urban Distance Education University, staff who work with students online stressed that the students need a lot of support, especially in the early phases of using interactive features of online learning systems. There are some central student support services, e.g. a basic computer literacy program to get students to what they term ‘emergent user status’, although this is generally not available to offshore students. Offshore students are supported by initiatives provided within particular programs, and at this stage there does not appear to be an institutional policy to cover this group. Academic staff tend to play a very important support role for students in these programs. The leaders of programs with offshore students, particularly those who have more experience, pointed out that the success of programs can often depend on the support students receive.

with beginners, you must not let them be intimidated by their ‘beginner status’… because it is very daunting.

7.6.4 Access to computers

Some information about computer labs was discussed in chapter 3, p. 25 and also in table 7.2. At the Multi-campus University of Technology, the limitations of ‘hard’ infrastructure elements, information technology, funds, library services, were acknowledged as problematic, but the overall impression was that one almost took for granted these concerns without needing to restate them. The biggest IT concern among a number of faculty staff was lack of student computer laboratories and a related issue was that if there are insufficient laboratories on campus, then gradually students will be required to have certain level of computer and access at home. But this reopens the equity issue … which is where we began this section.

We need new models. One such is described below:
Chris Trevitt has been instrumental in setting up the Centre for Educational Development and Academic Methods (CEDAM) Learning Studio at the Australian National University as an institutional experiment.

The Learning Studio comprises a flat-floored room large enough to comfortably accommodate some 25 students. It is equipped with five main work-tables and 30 office chairs (on wheels). In addition it has five networked computers on small desks distributed around the wall, together with a video and computer screen projector. One computer can be used to drive the projector. A video player can also be connected to this projector, and a networked printer is available.

It was envisaged that students would undertake supervised collaborative work in small groups. They could avail themselves of the networked resources and/or desktop software applications on a needs basis and perhaps under the supervision of academic staff. This might well be achieved through the group designating one of their number to ‘go off to the computer and come back with the required information’. However, it was considered likely that the bulk of their work in the room would be collaborative in nature, and facilitated by teaching staff through small group activities which primarily focussed on human interaction, debate and discussion. If required, the supervising academic could call for student attention to be focussed on the content of one computer display that was able to be projected onto one wall.

The notional group size of some five students is premised on widely acknowledged experience which indicates that groups smaller or larger than five tend to experience greater difficulties in making progress on a shared problem. The upper limit of 5 groups was expected to make it feasible for one supervisor to be able to keep track of each group’s progress and simultaneously tend to most group’s questions and difficulties in a timely way. It was also expected that these numbers should yield noise levels which are manageable within the physical confines of the room.

To support the process of rethinking of teaching practice a trial period was initiated during which individual academics wanting to use the Learning Studio were asked to arrange bookings through CEDAM. This period was initiated in 1998 and continues in 1999. This ensured we had a mechanism for ensuring that each prospective user would touch base and keep CEDAM informed of their activities and developments.

Within the resources available to CEDAM every effort is made to engage with each innovating academic wanting to ‘experiment’ with the new teaching environment provided by the Learning Studio. This engagement
takes the form of a small-scale ‘action research’ approach. It may involve rethinking and reworking significant portions of curriculum. Inevitably it involves taking a more outwardly professional approach to teaching. It involves clarifying what student activities are planned for the time being booked in this setting: what the learning objectives are, what group activities will be undertaken, what networked information resources are required and when, what other role may be played by the CIT infrastructure provided, what assessment structures and activities are planned, what evaluation opportunities are available for us to learn from the students about what worked well and why, and to seek feedback on what might be improved and why.

### 7.7 Summary and recommendations

This chapter on the use of computer-facilitated learning incorporated a whole gamut of institutional issues including IT, library and administrative infrastructure, professional development for staff, student support, educational and instructional design support for academic staff, funding and grant schemes and IT literacy. One strong themes that emerged is that the tension between central and devolved funding for hardware, courseware development and professional development. Each institution should map its own needs, resource levels and choose an appropriate model.

Some recommendations are:

- Internal mechanisms of funding create tensions between central administration and the faculties; both are appropriate; open exploration of this tension is needed.
- Funding for CFL development is ephemeral in many universities. Budget processes which build this in as an ongoing process are needed.
- Institutional development grants should focus on sharing processes and experience, as well as looking for product-oriented outcomes.
- The costs involved in hardware and facilities, and appropriate technical and support staff, are high. The development of internal models needs to assume high priority.
- The diversity of roles of ITS staff are high, and keeping skilled staff is difficult. Schemes to recognise and reward technical staff are needed as much as schemes to recognise and reward academic staff.
- Professional development and training is a complex and multi-faceted area. There is a need for high quality staff developers, for flexible support
programs, for using mentors, and allowing adequate time for staff to engage in staff development.

- Student support services cover a wide range of issues, including equity and access, access to academic help (this has implications for funding staff time), access to technical help, and access to computers. Further research is needed in all these issues.
8 Adoption and collaboration

The relationship between adoption and collaboration will be explored in this chapter. Data from the case studies, the institutional survey and vignettes of academics’ experience will be used to explore issues associated with adoption or uptake of CFL and how the degree of adoption can be strengthened by internal and external collaborative ventures.

8.1 Adoption

Academics will adopt CFL when it makes sense for them to do so. The data from this study shows that adoption will occur when:

- when appropriate policies are in place;
- the culture supports this, in particular when collaboration is encouraged and supported; and
- when adequate infrastructure and support structures are in place.

Figure 8.1 (same as Figure 4.2) illustrates this. When the circles of policy, culture and support overlap, a domain of adoption can flourish. The labels in each of the circles have come from the sub-themes identified through the cases studies, and are supported by the institutional survey and vignettes we received from academics about their experiences. Funding, which has been discussed in Chapters 5 (Policy) and 7 (Support) can be seen as a ‘glue’ holding the tensions between various factors in some sort of stable state.

Figure 8.1 Major factors affecting the adoption of CFL
We will explore this in more detail by analysing adoption at three of the case study institutions; we have chosen three which exemplify three key types of Australian institutions—a university of technology, a distance education university and an established sandstone university.

### 8.1.1 Adoption at the Multi-campus University of Technology

At the Multi-campus University of Technology faculty studied, there is, in general, widespread acceptance and use of CFL approaches at a basic level (e.g. making reading materials available electronically in the library, etc.), but less evidence of a strategic or ‘integrated’ approach across the whole faculty. Senior management, for example, believe there is still a fairly high degree of resistance to CFL among some staff, even though there is also a significant number of enthusiasts. There is however, a firm indication from senior management that an integrated and strategic approach to the use of CFL approaches, is the direction the Faculty wishes to take.

At present, however, the uptake and use of CFL could be characterised as uneven. One informed estimate was that about 50 percent of all units offered use CFL to some degree. The views of a number of later adopters confirm the unevenness of take-up across the faculty, seeing it as more ad hoc use and piecemeal development.

In summary, the take-up of CFL in the faculty could be described as widespread at a basic level, but very much more isolated or confined to certain areas with respect to sophisticated programs designed to qualitatively and quantitatively improve the nature of the learning experience.

While many of the initiatives taken to date have been underpinned by a ‘project-based’ approach, there has been a degree of transfer or accumulation of existing knowledge about use of CFL. The more recent ‘larger’ project groups reported, for example, that they were building on the previous experience of earlier projects. Thus, in terms of faculty understanding and adoption of CFL, there is an increasing body of ‘organisational’ knowledge held within the faculty. This knowledge, however, has not been shared with or ‘heard’ by all members of the faculty. Hence, the strongly held opinions expressed by some that they knew little of the outcomes and benefits of these CFL projects.

Management and project members cited a number of factors that have prompted the trend to the use of CFL in teaching and learning including:

- funds from institutional grants;
- leadership from a previous dean;
• high number of enthusiasts within the faculty; and
• some incentive from institutional policies and stated future directions (e.g. move to flexible delivery).

In particular, it was felt that those who were enthusiastic, had the respect of their peers and were able to carry others along, had had a major impact.

_I think it’s been very crucial that it’s been the good teachers who have been the innovators in this regard …_

It was also a general feeling that the high proportion of younger staff in the faculty contributed to an openness or willingness to try something new.

One humorous ‘defining event’ identified by one staff member was that all staff became very much more technologically literate when pay slips went online!

The factors that staff reported on which would motivate them to use (or continue using) CFL included:

• obtaining feedback and evaluation about what is good practice and what is not. Staff want evidence that there are benefits to using CFL;
• having a sense of ownership about the whole process, that it is inclusive rather than competitive;
• seeing how an increase in flexibility can learning outcomes;
• increasing efficiencies;
• providing means of offering courses offshore; and
• giving a distinctive competitive edge to courses.

Some factors which come into play, resulting in negative staff conceptions towards use of CFL include:

• attachment to traditional modes of teaching and concern that this will be lost in the push to a technology-driven environment;
• scepticism on the part of some staff about the motives that underpin the involvement of some of the early adopters (e.g. using grants to buy themselves out of teaching hours); and
• that too many resources are going into development of CFL products, drawing away from other needy areas such as the ability to hire new staff.

One particular focus was on issues surrounding professional development and training. This is recognised almost without exception as playing a critical role in the effective use and uptake of CFL and yet an aspect with which everyone is still grappling to come to terms. This was explored in chapter 7, Support.
8.1.2 Adoption at the Regional Distance Education University of Technology

There is high degree of acceptance among all those interviewed that the online system is a key strategy and direction for the university, but many staff, it seems, have yet to adopt the approach themselves, even in a nominal way. As one support person indicated, the policy and infrastructure were in place, but that represents only half the story—staff acceptance remains the real key.

In this fairly early stage of implementation, there are still differing views from managers about the degree of integration the online system has achieved. One manager felt it was quite well bedded down, citing about mid-1998 as a turning point for acceptance and usage by staff. Statistically speaking there are good indicators to support usage, e.g. number of times students post messages to forums and so on. However, one interviewee pointed out that, while she believes the vast majority of subjects are ‘online supported’, that doesn’t necessarily mean that the majority of academic staff are involved. It is apparently the view of some, that it would really take five years or more before online strategies are really embedded into institutional practice and ideology. A number of the professional support staff indicated that while they felt it wouldn’t take that long, they did think it would be a gradual process.

It seems, therefore, that there is no uniform or widespread adoption pattern as yet—even if the criteria one uses is statistical—such as hits or access to various online features (listservs, forums, etc.). Educational designers supported the ‘unevenness of take-up’ overview, indicating that variables such as the attitude of the lecturers, the nature of the subject and the experience lecturers had teaching in a distance mode, were all important.

One senior academic indicated that the degree of integration within his school was very low, despite the availability of quite a lot of professional and support assistance. A useful comment was made by a professional support manager, who reported that many distance education subjects were still trying to operate in two modes: ‘traditional’ distance education and new online.

Academic staff offered a variety of factors which were important on an individual level to either get involved, or stay involved, with CFL and online teaching in particular. Some are:

- using technology to maximise learning or improve learning for all students;
- improving learning for distance education students;
- to be involved, it needs to be creatively stimulating;
- having adequate support including one-on-one training;
- knowing that others are involved as well and that they are getting something useful out of it;
• getting feedback from students that they are using it;
• being given useful strategies and tips to manage the process with big numbers;
• having more support from above, particularly coping with change;
• helping with workloads;
• just a sense of having to get involved—sheer terror of being left behind;
• feeling really keen to expand into other subjects—but lack of time prevents that; and
• knowing that you have to do it.

I don’t really know what it is—no-one has put pressure on me to comply and until they do I probably won’t.

The absence of these factors or their converse acts as a barrier to more widespread use. For example one staff member talked about her experience (using technology for the first time) as very enriching and yet felt she couldn’t continue that level of commitment because of lack of time. This was despite the fact that she was convinced that there was a discernible difference in the learning experience for students, particularly distance education ones, and this was the motivating factor to get involved in the first place.

8.1.3 Adoption at the Established University

Overall most respondents felt that the use of computers in teaching and learning, and especially of multimedia, was embedded into practice and ideology in the faculty. Certainly, the use of multimedia within the faculty has become accepted practice, but perhaps the best assessment is that there is evidence of well grounded and sustained change within specific subjects, rather than ubiquitous or transformational change across all subjects. One interviewee believed that the use of CFL had made strong inroads into the teaching framework of the whole university and within some areas had been used ‘to completely revolutionise teaching’.

CFL is well embedded in the department, but I can’t speak for other departments. I think it is given good recognition by the university, who showcase what is going on. I don’t think we have reached a critical mass of people actively involved in this department but I think there is widespread acceptance that it is a worthwhile venture.

A number of those working closely with developers and staff who use multimedia, felt it was a bit premature to see CFL as fully embedded into pedagogy and the learning process. One manager preferred to think of the faculty as still in the ‘honeymoon phase’, still getting processes and
procedures into place, but not as yet having the time to fully test and evaluate. Nevertheless, he acknowledged that the advances made to date are considerable and the faculty is seen as ‘one of the major hotspots in the country for embracing technology’.

There were a number of significant or ‘critical’ incidents in the past 10–15 years reported as influencing the nature and rate of use of computer-facilitated learning in general, and multimedia in particular. These incidents included:

- the need to replace chart recorders in classroom labs in the faculty;
- in one department a major change (1997) to the approach to science teaching with a goal to transform the curriculum;
- appointment of the current Vice-Chancellor;
- the introduction of the current grant system which supports interactive multimedia (IMM) development;
- the introduction of a new professional curriculum 98/99 with emphasis on problem-based learning; and
- 1998 collaborative agreement between two universities in the state; both universities committed funds for common projects relating to common needs.

Underpinning these notable events, a number of other factors appear to have had a more subtle and gradual impact, for example, the increasing expectations of school leavers to have computer-facilitated learning approaches. This may well be a flow on from the state Technology in Schools program as well as the proactive stance some of the independent schools have taken towards using computers in the classroom.

The following issues were raised by faculty staff, and those who support faculty CFL initiatives, as important in terms of getting, or staying, involved with multimedia and other CFL approaches:

- peer pressure;
- logistical reasons, for example, as a way of meeting increased student numbers, ‘telescoping courses’ where there is less time to cover more content, difficulty in offering small group tutorials, decreased access clinical settings;
- real teaching benefits, e.g. ability to present students with a multi-disciplinary approach to a topic by bringing together clinical specialists to construct a computer case study;
- sound evaluation—seeing evidence of improved learning outcomes using multimedia and evaluation of time and cost effectiveness as well;
• student demand—more and more students have high expectations that computers should be part of teaching process;
• changes in the professional curriculum;
• leadership from the Dean, the Vice-Chancellor, Heads of Departments;
• small grants for later adopters;
• support and sponsorship from a mentor (but a sponsor must have credibility in the profession);
• assurance from the university that they will continue to sustain this sort of change, especially through funding; and
• appropriate recognition and promotion opportunities.

Factors they felt that prevent people from getting/staying involved included:
• lack of knowledge;
• lack of academic time release;
• pressure to keep up research quantum; and
• lack of funding to maintain programs, staff and technical infrastructure.

In the majority of cases, people suggested that would it be a combination of factors that had led them to become involved, and that different factors at different times of one's own development were important.

8.1.4 Key issues in adoption

Four key adoption factors emerge:

• Staff need to believe that technology will improve the quality of students' learning experiences and outcomes. Evaluation evidence is a critical factor in adoption.

• Staff will use technology if they believe that it will assist with the logistics of managing student numbers and administration—if it will improve efficiencies and reduce workload.

• Staff need to feel supported in a variety of ways (see chapter 7). This includes having access to some form of one-on-one training or mentorship.

• Staff need appropriate recognition and promotion opportunities related to work they undertake using technology in teaching and learning.

A few additional comments and examples that were received on the first three factors follow. The case study interviews did not explore recognition issues in detail, though it was mentioned often as being necessary and definitely being insufficient at present.
8.1.5 Evaluation as a crucial aspect of adoption

Evaluation is a crucial aspect of adoption. In the Multi-campus University of Technology faculty, evaluation and making decisions to use or adapt existing CFL resources can be considered from two perspectives in relation to widespread use. It is, for example, an efficient and perhaps less costly way, of accessing CFL resources if they are appropriate to need. However, the case study revealed that sound evaluation of externally and internally produced resources, accompanied by the dissemination of these findings is an important factor for the majority of staff, especially later adopters of technology, as to whether they would consider using a specific program or generally viewing CFL as a legitimate teaching methodology. In other words evaluation can be a strategy or tool to convince staff of the potential value of CFL, or otherwise. A number of staff agreed that they would be prepared to change their current stance (sceptical) if evaluation showed the need or rationale to use CFL.

Also important to convince others in that the projects were shown not to be ‘pie-in-the-sky’, whiz-bangery, waste-of-money stuff: It’s been embedded into teaching approaches and unit objectives so it’s not a geewhiz add-on. … It has a definite educational function in the unit.

Using CFL may not mean producing specific resources; in the story which follows, students' own work becomes the prime focus for discussion and reflection. The use of an external evaluator is a valuable quality check.

Sue Roberts teaches Children and Televisual Literacy at Macquarie University. One aim of this unit is to provide students with an opportunity to gain insights into the structure of television programming which is designed especially for the child audience. In keeping with this aim, students are asked to write a script treatment specifically for the preschool or primary school-aged audience. They use a bulletin board to share and receive feedback on progressive drafts of their scripts. Moreover, students are becoming used to chat discussion via bulletin boards. The facility is particularly good for airing ideas and receiving feedback.

Some class time is devoted to discussing particularly interesting postings, with the authors' permission. The authors themselves said they found the synchronous form of discussion helpful and I hoped that it stimulated the other students to go off and send a bulletin or respond to another student's posting. Four students submitted excellent script treatments in 1998. With their permission, I sent their treatments to an Australian Broadcasting Authority children's programming consultant, who confirmed that they were of high quality.
8.1.6 Workload as a major inhibitor

Academic and support staff at the Regional Distance Education University highlighted lack of time as one of the biggest barriers to uptake.

I think workloads and time is one of the biggest barriers to uptake—you have to have a particular interest in technology to explore it in your own time.

I think the online is a wonderful innovation for students and a resource for teaching excellence, but the time required to do a proper job has to be acknowledged in our teaching loads. If they want academics to take it seriously, the IT has to be factored into workloads, not just put on top as an extra. I think there is a lot of reluctance about it because of that and until it is sorted out there will be a huge resistance. It’s going to be an ongoing industrial issue. I’m already pushed for time—I’m supposed to be publishing.

At this university, there is substantial online activity but funding for additional support staff comes from offshore fees, not from central university funds.

At the Multi-campus University of Technology time was mentioned by all categories of respondents as a significant inhibitor to use (and development) of CFL. It was acknowledged that some people involved in development of products have been given release time, and how essential this time off was to complete a project. Almost every respondent directly, or indirectly, cited lack of time as a significant problem.

To move forward, one academic leader suggested it was crucial to have capital investment in time for staff. Staff need time to just think about things—not necessarily develop a new program. This is often ignored: recognition that staff who are trying out something new, implementing what is innovative to them, also need time off to do this. Typically time is only given to the innovators or those developing a new product.
Curtin University of Technology. The transition towards effectively integrating technology into the teaching and learning environment we have found depends critically on setting realistic and achievable timelines. Given we are attempting to change culture and attitude it must be seen as a long term process which flows and fits well with how the academic community functions. Simple things like establishing minimum standards and procedures for student email (i.e. ensuring that every student has access to and can use email from day one) help knit together the environment that is needed to make IT an effective and useful tool in the learning process. In the early IMM days a common criticism of the educational technologists was that they made it appear to be easy and 'over sold' what could be achieved. Since the heady days of the 90s we have seen the emergence of a range of much easier to use tools which don't require the 'technical overhead' of the earlier IMM development. Using these tools to supplement and complement current practice is a much more effective way of integrating technology into the learning environment than trying to replace wholesale teaching components.

8.1.7 Adoption depending on key individuals

The degree of adoption really varies. It depends on staff, students, subject, content, resources, etc. Adoption often depends on key individuals. In the vignette that follows one academic’s interest has spearheaded a significant change at one Monash campus.
James Moulder uses Learning Space at Monash Mt Eliza Business School. (See also Brick, d’Arbon & Robson 1998)

It was mainly curiosity that prompted the innovation. I’d read about educational technology and wanted to see how it worked. At the same time, I was aware that many Monash Mt Eliza students are part-time and find it difficult to attend classes. So, I married my curiosity to their need and got going. And LearningSpace was used because my daughter gave me a copy as a Christmas present.

I haven’t involved the Library. I wanted to see what I would get when, instead of offering a textbook-based/ readings-based course in a lecture-driven classroom environment, I used the same materials in a set of electronic one-on-one Oxford type tutorials. Because this is what I wanted to do, the fundamental challenge was (and still is) to choose problems and readings that stimulate discussion and debate. Although I had a fair collection of this kind of material, almost none of it was on the web; so the challenge has been to find web-based readings that provoke the kind of give-and-take teaching/learning that I enjoy. It wasn’t difficult to find the material; but it did take time. And, on average, I spend 10 hours a week hunting down material with the help of various search engines.

By the end of 1999, all the full-time staff at Monash Mt Eliza will offer at least one course in LearningSpace. Not surprisingly, they have rejected the idea of a one-on-one tutorial approach and are going for two other legitimate options: using LearningSpace to prepare for or follow-up on a lecture; and using the software to deliver multimedia-rich courses, which is how it is meant to be used. I’ve trained the 10 people to use LearningSpace; they are exploring collaboration with Monash’s multimedia development unit; and they are moving towards appointing a graphics designer to assist them with the development of the material they plan to use.

I’m also researching the implications of the fact that LearningSpace is now available in Mandarin and other languages, and will reasonably soon incorporate IBM’s translation and voice technology. This will mean that students who don’t have the same language can take the same course. It will also mean that students who communicate their ideas more fluently by speaking than by writing will find LearningSpace more user friendly than they now do.
In the institutional survey we asked ADU staff to consider the following categories of CFL users (see figure 6.1, p. 96)

- innovators;
- early adopters;
- users when technology is mainstream; and
- very reluctant users.

They could list some areas in their university where staff were past early adopter stage. Figure 8.2 shows the data about which factors they believed contributed to a wider adoption of CFL. The data in the survey was in a five-point scale from very important (5) through to not important (1); the data has been collapsed into two categories—important (4&5) and limited importance (1-3) in order to see trends more clearly. Key individuals, faculty-level policy and funding are seen as main drivers.

Figure 8.2: ADU staff perceptions of factors supporting CFL adoption (Q 4.9)
8.2 Customisable computer-facilitated learning materials

Many university staff believe that there will be greater adoption if the technology becomes easier to use. One aspect of this is the generation of easily customisable materials.

At the Multi-campus University of Technology faculty the concept of customisability was favoured for three reasons:

- Professional data has a short shelf life, and templates which can be updated make sense.
- Templates can also be adapted/modified for use by others in other related areas.
- It enables designers to think flexibly and get ideas from products in other disciplines.

Most projects, particularly the more recent ones, made a fairly systematic attempt to search for and evaluate other resources/products in their initial phase. However, the result almost invariably was that there wasn’t anything that fitted the specific, sometimes argued ‘unique’ need.

*I think that (‘not invented here’) is something which permeates all of higher education and there is no reason to expect that it wouldn’t apply to computer-based stuff… there is no reason to expect that people are going to use other people’s CBE programs, any more than you expect me to use other people’s print packages, study guides or course structures.*

At present at the Established University, it was generally felt that the faculty, and the university, were in a transition period, but the aim was to get two-thirds of university staff involved or inspired and within five years to have the use of CFL as the norm and embedded in the culture. One healthy indicator of a trend to more widespread use was a comment made by a member of the professional support staff within the faculty that many of the approaches they were receiving from staff were not about developing new complex programs, but how they can ‘put their content’ into existing ‘templates’. These were seen as reusable at undergraduate, postgraduate and community education levels, although issues of evaluation and updating were mentioned regularly.

*We have to resource ourselves any maintenance or updating of existing programs—it is very difficult to do. Its very costly not just to update but to review all existing programs to see which ones required updating and whether we would be better off making new programs or updating old ones.*
One staff member at the Regional Distance Education University mentioned that it would be useful if commercial publishers would allow customisation.

The Urban Distance Education University has taken a pragmatic approach. An online environment for teaching and learning was established in 1998; it was based on a common or standard approach which can be implemented across all subjects and programs. All academic staff, all courses and subjects will have their own home page. It will be used to support both distance education and on-campus students. It was described by several senior staff as unique, in the sense that it offers a low cost way of putting the university’s entire program online as fast as possible (without requiring additional skills on the part of academic staff or an intensive ‘production’ process). It is providing an environment based on data stored in warehouses and accessed via the web using templates, wizards, etc. This approach has been taken so that the learning curve for the majority of staff is manageable.

*It’s just convenient—because for me if it isn’t really easier and if it is not instant—I don’t have the patience for it. You can’t wait three weeks to see these things up, or to wait three weeks to be told to wait for a few more weeks…*

The challenge with this approach is to avoid having materials developed that are ‘flat’—a emphasis on information rather than interactivity and communication. The issues of online educational design were mentioned in chapter 3, p. 28.

This is clearly a complex area and just what is meant by customisation varies. Twining, Stratfold and Kukulska-Hulme (1998) look at consortia, generic authoring systems and a component approach, and comment that these have not been successful. Customisable re-use is much more than having a set of templates.

An interesting initiative is the ARIADNE (Alliance of Remote Instructional Authoring and Distribution Networks for Europe) project [http://ariadne.unil.ch](http://ariadne.unil.ch). This is a consortium of 20 European universities with the overall aim of ‘share and reuse’ of educational material. For this purpose, they have set up a distributed Knowledge Pool System of reusable multimedia educational components, with an associated core toolset for describing resources, querying local knowledge pools, defining course structures and generating web sites for structured delivery of courses. This is a good example to lead into the issue of collaboration.
8.3 Collaboration

Broadly, we need to consider two types of collaborative projects: internal collaborative projects between faculties, departments and institutional units such as the Library; and external collaborative projects between universities or between universities and other partners, such as industry or publishers. There are different types of collaboration—large grant applications, professional association to produce materials, close partnerships between a small number of people.

Within the faculty at the Multi-campus University of Technology, CFL is a strategic issue and therefore the goal is to integrate it into the total educational approach. The grants scheme is seen by one senior academic as a way of encouraging internal collaboration, because they endorse getting lots of people involved. A few individuals, however, have found it easier to work collaboratively outside the system, free of the constraints imposed by existing policies and practice. Also some academics like working alone and do not collaborate easily. This opinion seems to contradict that of others who stressed the team teaching culture within the faculty. It may well be an indication that individuals are comfortable collaboratively in some spheres of the work, but less so in others.

Many of the respondents interviewed at other universities emphasised the educational aspects of collaboration. Through collaboration (internal and external) staff can draw on a large pool of expertise—educational, technical, allied content areas, and also people with experience in development and evaluation. It is possible to get a multi-disciplinary approach to a topic. Also, collaboration between newcomers to a field and someone with a track record can benefit both.

This does create some challenges:

- bringing together people from different work cultures;
- redefining boundaries of responsibilities and expertise between cooperating divisions;
- equipping staff with collaborative and communication skills;
- building an atmosphere of equal sharing, contribution and recognition; and
- dealing fairly with issues like intellectual property and its embodiment in possible royalties.

The Regional Distance Education University has instigated new ways of fostering closer working relationships between institutional support, professional IT groups and academic staff. It appears that they are beginning
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to achieve a better understanding and cooperation, but it was described by one manager as still ‘an up-and-down sort of relationship’.

This has involved being happy with fuzziness of boundaries, for example, between educational design and technology.

One of the issues is the boundary between educational design and technology—no definite boundary, it’s very fuzzy—the fuzzy borders has caused a lot of dilemmas and tensions.

The vignette below describes an internal collaborative project that had a strong impact on the university’s flexible learning policy.

This vignette briefly explores first-year Geography and Environmental Studies at Macquarie University by Andrew Pitman (Department of Physical Geography) and David Rich and Maree Gosper from the Centre for Flexible Learning. GEOS114 Global Environmental Crises is a large (~400 students) foundation-level unit requiring no prerequisite knowledge. The unit is taught jointly by the departments of Physical and Human Geography. It is available to both on-campus and distance students, and to those wishing to combine these modes in a flexible manner (off-campus study requires Internet access).

GEOS114 is structured around four topical modules which introduce a group of environmental issues. It uses an integrated multiple-media package: two weekly lectures, available both live and via audiotape; print-based materials in the form of a study guide and a purpose-written, commercially published textbook; and five IT-based components accessible via a common interface written in HTML and CGI scripts, and accessed through the NCSA user authentication protocol using an Internet browser.

Extensive evaluation (Pitman, Gosper & Rich 1999) has been positive. The success of the experiment has been a stimulus to the emergence of a University-wide flexible learning strategy at Macquarie. Many of the methods and lessons are transferable to other disciplines at the University, or to other Geography course units outside of Macquarie. In policy terms, the GEOS114 team was able to attract continuing funding partly because of a growing Executive-level interest in the use of IT to support teaching. The unit became, effectively, a test-bed for this enthusiasm. Generally good results and positive student responses were amongst the important factors in encouraging Macquarie to create the Centre for Flexible Learning and embark on a flexible learning strategy.

Often active collaborations are difficult to sustain, even though initially they may be easier to establish with respect to attracting funding. If there is a mutually agreed framework, then useful results can emerge. Effective project
management can bridge the gap between the intellectual providers and those with technical expertise.

One has to allow for the time it takes to negotiate with other institutions, publishers, IT providers, etc. This can be daunting unless there are clear aims and lots of goodwill. Conversely, some staff believe that it is often easier to work more collaboratively across institutions than within one’s own university.

A good example of an external collaborative project between a university and industry is Kantaro. The research and development of three Multimedia Japanese courses, known as Kantaro 1, 2 & 3, was conducted jointly by Macquarie’s Japanese Studies Department and Fujitsu Australia <http://www.mq.edu.au/MDLang/Japanese/multimedia.htm>. Kantaro are interactive multimedia kanji teaching packages which have received international recognition. The Kantaro programs are incorporated into the Japanese language program at Macquarie, and are also widely used in Australia, New Zealand and by universities in Japan and in the USA.

The vignette below describes a successful collaborative project between a university department, a university multimedia unit and a government-funded health centre. The design of the Cd-Rom allows it be used as a basis for other products. The vignette shows both the idea of collaboration and customisable CFL.
CAMEO-B is an interactive CD-Rom designed for medical students. It simulates a clinical situation in which three women are diagnosed with breast cancer and are at different stages of disease. Medical students take on the role of a ‘generic’ medical practitioner as they pass through the processes of history taking, examination, initial assessment, referrals, management and follow-up with the three different women. The CD-Rom contains a library of resources, including a range of text, graphics and video content.

CAMEO-B was developed by Educational Multimedia Services of the Teaching and Educational Development Institute, University of Queensland in conjunction with the University of Queensland’s Department of Social and Preventive Medicine and the National Breast Cancer Centre. There was also a great deal of involvement by local and national advisory groups and steering committees, with representatives from hospitals, medical schools and breast cancer specialist groups nation-wide, all being involved in both content development and review and overall package design decisions.

Development of a national breast cancer curriculum for Australian medical schools is a joint project between the University of Queensland and the National Breast Cancer Centre. All aspects of the national breast cancer curriculum have been incorporated into the CD-Rom. CAMEO-B is currently in its evaluation phase with the following universities using the package in 1999: University of Queensland, University of Melbourne, Monash University, Flinders University, University of Newcastle, University of Western Australia, University of Tasmania, and University of Sydney.

Positive evaluation outcomes have been obtained with both lecturers and students.

The model has been designed as a Cameo to enable a multi-dimensional application to other cancers. We have already been involved in some planning for CAMEO-R (Rectum). Overseas medical schools have already shown some interest and have been involved in discussion and demonstrations. The package could also be adapted for nurses, counsellors, patients and professional doctors needing further education. We have also been approached by other potential clients desiring a similar style product to meet their needs, post-traumatic stress counselling being one of those. Other groups within the Department of Social and Preventive Medicine have also discussed the potential of using various features of CAMEO-B as tools for the students in conjunction with other materials and lectures, e.g. the conversation engine as a possible tool to assist with counselling technique development.
The key principle is that all partners must benefit in a collaborative venture; it should do better than either independently. Also, a team spirit, good ethos and enjoying work are essential; this is often forgotten in an economic rationalist environment.

At the Urban Distance Education University there are collaboration examples on a number of levels: with an offshore agent, an external online developer/provider and with various university academic and support staff. In one of the projects studied, at all three levels there has developed very good working relationships, resulting in a strengthening of commitment, collegiality and a sense of purpose and self esteem for the staff involved. It appears that, a number of the issues between partners in cooperative ventures have been avoided or minimised through clear definition of roles, and capitalising on each other's strengths to create a complementary rather than competitive working environment.

It has been pretty refreshing to work with staff in the (course noted) (and also the Hong Kong program), who have got some resources, some discretionary resources so they can put together these sort of developments. They have been able to work well with us and put together, I think, an excellent product.

From the point of view of the external provider, the relationship has worked well because it was reported that the university partner has been free of many of the restrictions and restraints which often hinder and impede pace of development. Furthermore, the program has been successful financially, and to date has enjoyed considerable support from senior management within the division.

Certainly, there is an acceptance that many staff are already involved in cross-institutional projects for the use of technology in teaching and learning. For example, the survey data showed that staff in 14 out of 25 academic development units are involved in such cross-institutional projects.

Andrew & Klease (1999) describe an example of a large-scale collaboration which involves teaching upper undergraduate, honours and postgraduate chemistry specialisations at regional and remote universities using videoconferencing. The project involved Central Queensland University, Deakin University, the Northern Territory University and the University of Tasmania. It was successful because institutional compliance, staff development and student preparation had all been considered. Andrew & Klease identify the following issues that must be considered in successful inter-university collaborative teaching ventures:
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• clear understanding of roles and responsibilities of all participants and participating institutions;
• adequate forward planning and lead time;
• timetabling;
• sharing of resources—facilities, staff, units of study;
• appropriate technical support;
• administrative support;
• unit and course accreditation;
• assessment;
• embedding into university structures—prioritisation and strategic planning;
• intensive, comprehensive ongoing staff development; and
• student preparation for learning in technologically mediated learning environments.

Collaboration is being smart in the current climate. Many people feel we need to get better at it. It was generally agreed that collaborative initiatives with national and international partners will play a much bigger role in the future. Collaborations with external organisations are still very new and uncertain. Universities in particular had much to learn about successful partnerships and commercial collaborations. Furthermore, as the current climate is perceived as becoming more competitive between institutions, we need to explore the relationship between collaboration and competition.

8.4 Collaboration and competition

A factor which works against collaboration with external organisations is the emerging competitive environment. Colleagues are now seen as competitors and therefore there is a reluctance to share developments. Present government policies, one interviewee argued, have had a significant role in bringing about this situation—everyone is seeking a competitive edge.

At the Multi-campus University of Technology senior management, those in leadership positions (structural or informal) or those who had been in charge of a project, saw CFL as a key strategy in terms of gaining and maintaining a market advantage, of competing with interstate competitors and for strengthening ties with professional societies. CFL therefore is strategically important for a number of reasons to maintain market share, to address students’ expectations of modes of study and to improve their familiarity with the use of computers. Also the increasing numbers of students in courses is driving the need to use technology to cater for large cohorts and particularly
external students. Finally, it was seen that as a university of technology, the use of CFL can differentiate courses and programs in the marketplace and demonstrate to the students that the university is up-to-date with a modern world that is reliant on computers.

As we have noted above there is a tension between collaboration and competition. This is shown diagrammatically in figure 8.3 where collaboration show institutions being drawn together and competition pushing them apart.

Figure 8.3: Tension between collaboration and competition

We argue that there are benefits in both perspectives. We have tried to show this in figure 8.4 which summarises the drivers for both collaboration and competition. If the aim is to produce high quality educational offerings there are drivers for both collaboration and competition relating to quality standards, financial viability and raised prestige.
Johnson (1992) claims that polarities are sets of opposites which can't function well independently. Because the two sides of a polarity are interdependent, it is not possible to choose one as a solution and neglect the other. The aim of polarity management is to get the best of both opposites while avoiding the limits of each. The solution resides within the tension between polarities. Brearley (1997, p. 15) sums this up as 'Polarity management is a vibrant and messy state. It is the tension which can form the springboard for creativity, learning and change. It is rarely comfortable and always dynamic'. We can view collaboration and competition as being at the two poles.

Issues of quality should be the main driver which determines the balance point between collaboration and competition. Issues about the competitive edge are not around resource materials but around support strategies for students. The quality of the educational experience is what counts—the quality of the materials and the ways they are used.

At the Established University, IT is not seen by faculty management to be driven by a strategy to gain additional 'market share'. Effective use of IT is, however, seen to be strategic in the sense of aiming to deliver a quality educational product which exploits the advantages technology can provide. How IT is used in educational context is seen as strategic, so everything is aligned with the culture of the university. There was, nevertheless, an appreciation that there is a growing sense of competitiveness between universities and that what one does to improve the quality of the teaching
and learning experience, will be important in attracting and retaining the best students.

There was a strong suggestion by some respondents at the Urban Distance Education University that online programs afforded a competitive edge. However, for many of the staff teaching in these programs, the potential competitive advantage came, not so much through the online capability per se, but through the quality of the teaching and learning they could build using the online environment effectively.

It is not having fully online courses that gives a competitive advantage. We can offer face-to-face teaching in Asia to add value to the online experience. It is building relationships that is important through designing high quality interactive learning environments; technology is only one element in this design process.

There has always been a tension between competition between universities or departments/schools and the ethos of collaborative research. Many interviewees stated that the climate of funding is exactly contrary to the philosophy of open sharing.

### 8.5 The balance point?

This is not easy to find. It will depend on each situation. Healthy competition is assisted by judicious collaboration. And being effective in maintaining a viable and vital university depends on having staff with the skills and attitudes to use the potential and possibilities of technology. Widespread adoption of CFL materials and strategies within a university is a precursor to developing a niche in the higher education sector.

In this chapter collaboration is examined as being a key feature to increasing the take-up of CFL in the higher education sector. Unless the climate within and between universities supports the development and use of CFL resources, there will not be an increase in appropriate uses of technology in teaching and learning. Some particular issues that were highlighted were:

- Time and workload: from an institutional point of view, the current situation is that infrastructure and time allowance for a relatively small number of staff are possible. Mainstreaming the use of CFL has enormous resource implications.
- Good evaluation of existing CFL programs is a crucial aspect of adoption. Late adopters want evidence that CFL materials and strategies can enhance student learning.
• Adoption depends on key individuals who can be role models and mentors for others. Institutions need to recognise and support these individuals.

The tension between collaboration and competition is important. We argue that collaboration can assist healthy competition in the higher education. Using resources efficiently in collaborative arrangements can allow institutions to develop their own specialities more effectively. During the next few years each university will need to find its own balance point between external collaborative work and internal work aimed at developing its own specialisations.

Having established the concepts involved in enabling staff in universities to be able to take advantage of technology, we return to the task of discussing how they might best get access to information about CFL and have access to the ideas and resources of other colleagues.
9 Dissemination and databases

9.1 Dissemination and search

In Chapter 5–7, we emphasised the need for policy, culture and support issues to be addressed before effective adoption of CFL can occur. Collaboration was explored in Chapter 8 as enabling development and adoption of CFL. In this chapter we will build on the theme of collaboration by developing a model of distributed databases, based on joint metadata standards. We will examine processes whereby information about CFL resources can be disseminated. Effective dissemination is essential if more widespread adoption of CFL is to occur. The quality of information about CFL resources that is disseminated is critical. In this chapter we will develop criteria, based on academics’ perceived needs, about what information should be disseminated. Evaluation evidence features strongly in these criteria.

Dissemination of information about CFL resources via database collections for the purposes of focused information retrieval and as well as general resource discovery are fundamental parts of this study. There is a complementary relationship between searching and disseminating, as illustrated in figure 9.1. Owners of CFL resources may choose to disseminate information about their resources, so that they appear in databases. Databases can be searched for appropriate CFL resources which may be used by an academic as teaching and learning resources. A key challenge, however, is in aggregating the content and value of distributed databases. This chapter investigates the barriers to dissemination and shortcomings of existing databases of CFL resources, and refers to technical issues relating to effective use of databases developed with the latest internet technologies. The chapter concludes with a description of a distributed, interest group-based database design, and discusses a range of policy issues related to a unified database framework.
Let us discuss Figure 9.1 in more detail. The process describes two linkages between resources and databases: dissemination of information about the resource (steps 1 to 4); and searches for information about resources by interrogating a database (steps 5 to 7). The various parts of the diagram are described sequentially in the following steps:

9.1.1 Dissemination
1. The developer of a CFL resource is the resource owner.
2. In order to disseminate information about the resource, the resource owner produces a description of the product.
3. The information describing the resource is sought out by a search database owner.
4. As a result of this dissemination process, the description of the resource becomes part of the database.

9.1.2 Search
5. The user seeking information performs a search of the database with a search engine.
6. The user considers the information returned by the search, and tries out promising resources.

7. In order to use the resource for teaching and learning activities, the user must fulfil the intellectual property requirements of the resource owner.

An example of this process is the EdNA Directory Service which was launched by the Commonwealth of Australia in November 1997, as an attempt to provide for searching and dissemination about CFL materials. It was designed to be an online ‘first entry-point’ for a wide range of information and resources relevant to education and training in Australia. Development of the Directory Service began in 1995 and has been guided by principles of quality information retrieval and resource discovery together with the provision of networking opportunities to its stakeholders. High-quality catalogued online information resources are made easily accessible, and a wide range of electronic discussion groups are hosted. Further information about EdNA is on p. 154.

An international collection of information about CFL resources is available from the Teaching and Learning Technology Programme (TLTP) in the UK <http://www.le.ac.uk/tltp/>. Under this initiative, 108 projects have been funded since 1992. There have three phases with an increasing emphasis on implementation and evaluation, rather than just development, after a 1996 evaluation of the programme (Gilbert 1999). The projects are searchable in several ways at <http://www.le.ac.uk/tltp/projserv.html>.

9.2 Dissemination

9.2.1 Dissemination about CFL in general

In general, evidence from the case studies and from the survey indicates that there seems to be an increasing focus on information dissemination about CFL. For example, one university had organised a ‘show and tell’ expose of CFL, in which approximately 20 percent of academics were actively interested. Anecdotal evidence from other universities indicates that this is a high figure, but it is still too low to show that CFL has reached the phase of mainstream acceptance.

A senior manager at one university reported that the university’s approach had been to provide core funding to progress teaching and learning into the IT phase. Funds were used to stimulate staff to use IT, with the implicit notion that those that received central funding would diffuse the outcomes of
that funding elsewhere across the university. The importance of this approach was confirmed by a staff member of the same university:

*You need to go around and see the programs and talk to somebody else… I think that sort of organic, person-to-person cross fertilisation is really very important.*

Word of mouth was found to be a primary tool of sharing what had been done within another faculty. Regular staff meetings and newsletters were also found to be useful ways of informing people of the latest developments. In the past, this faculty had experienced people not knowing what was going on.

At another institution, one or two people spoke of their role within the school and faculty to disseminate information of good practice or hints. They felt they had a reputation because they were early adopters and were prepared to help out.

### 9.2.2 External dissemination of information about CFL resources

The strong weight of evidence from the case study data is that little importance is placed on the external dissemination of information about development work on CFL resources.

As one example of the paucity of information about CFL resources, the medical faculty in the study discovered, purely by chance, that a template had been devised by a dental clinical school that was more suitable than the one they were going to build themselves. By choosing to use this template, they were able to put the money into medical case studies. This issue is highlighted by Bryant (1998) who has two and a half years of experience as the Information Officer at the Institute for Interactive Multimedia at the University of Technology Sydney. He assists academic staff to locate existing educational multimedia resources suitable for use and adoption to varying subject area needs as a first stage in the multimedia development process. He has developed methods for carrying out a search using a range of online and print resources from both local and international sources. This type of support is vital at this stage to facilitate efficient search practices.

At another institution, neither project studied was actively marketed. In fact, the leader of one project was wary of having their successful model copied by others. The wariness theme was repeated by another person, who was worried that his project might not work, that it might turn out to be disastrous. This person was unwilling to disclose too much information about the development of this project.
In one case, the success of marketing programs of CFL resources was seen to be fairly low, for a number of reasons:

- Many potential purchasers/users were not sophisticated in the use of computers in teaching (still looking for multiple-choice questions or hyperlinks) and therefore many of faculty's programs would not suit them.
- Everyone is keen to be a seller in the marketplace, but no-one wants to be a buyer.
- Some programs proved to be too difficult to transfer to another context—there were technical, content and remuneration barriers.
- Commercialisation often becomes a dead issue; not many people are interested in pursuing this.

A senior manager from one university felt that his school had not performed well at disseminating and marketing CFL resources which had been developed within the school. Any attempt at dissemination had been done individually, through home pages and word of mouth.

At another university, a few interviewees suggested that they were more than happy to share information and have their resources used more widely. This would be achieved by using, for example, a publishing system under a licensing agreement. One person indicated how proud they would be if they could pass on information. The licensing agreement issue was highlighted in another case study, where several interviewees pointed out that they would be happy for others to use their programs if royalties were paid. The model of AEShareNet <http://www.aesharenet.edu.au/> mentioned in chapter 5, p. 89 is relevant here.

Dissemination involves telling the stories of good practice and finding mechanisms by which good materials can be used by others; the latter can be difficult. This vignette illustrates some problems of dissemination of student-produced work.
Donna Gibbs teaches Curriculum Studies as a unit in the postgraduate offerings of the School of Education at Macquarie University. In 1998 it was delivered online for the first time using WebCT. There were 13 students enrolled—one based in Taree, NSW, one in Seattle, USA, and the other 11 based in Sydney. There were three on-campus sessions which Sydney-based students could attend.

As the content of the unit centres around building understandings of the nature of curriculum and its delivery it was important to present the material in ways that model good practice. A major difficulty was selecting material which would have appeal for students whose curriculum interests ranged from law to nursing to workplace training to school teaching and beyond. To overcome this problem prior knowledge of a typical candidature for the unit was drawn upon in the design and as much choice as possible was built into the modules. Students were encouraged to select what interested them and pursue that at some depth, but at the same time they were encouraged to read through all the options available to them as a way of broadening their understanding of curriculum in its different contexts.

It is not really possible to share the unit as it is designed for Macquarie’s fee paying units. Some of the material which arises from the student’s work, such as the Resource Packages they develop (and these of course range widely), would be excellent for sharing with others. But as far as I know there is no real mechanism for this. It would be possible of course with the students’ permission to develop a web page and store them there for anyone to access. I would really like to do this but haven’t attempted to. Some titles from last semester’s resource packages include:

- An Educational Interest Group - the History Teachers’ Association;
- ATSIC and Aboriginal Language Curriculum;
- Advancing Nursing Practices;
- Northside Gifted and Talented Network;
- Excellent and Equity since 1989;
- Influences on Curricula at the College of Law;
- NSW Adult Migrant English Service; and
- Enrolled Nurses, TAFE and the Department of Health.
9.2.3 Internal dissemination of information about CFL resources

Dissemination even within a faculty seems to have been problematic. One project caused a furore among faculty staff because details about the project were not disseminated and project members were given time release without the knowledge of colleagues. Various respondents had the view that they did not know what was going on because they did not get reports about what was happening. A side effect of this was that lack of knowledge about initiatives prevented other people from getting involved.

Some projects were perceived quite strongly as internal initiatives, which were never intended to be used beyond the institution; they had been developed for internal students with institutional funding and there really ‘wasn’t any obligation to share it’.

There was evidence that effective dissemination was occurring within the Urban Distance Education University. Senior management in one division reported an increase in the sharing of ideas and approaches between the division and the CFL development unit. A willingness to share seems to a key feature—a culture of sharing. For example, the CFL development unit is working towards incorporating a feature into a centralised system, based on work done with Lotus Notes by a member of staff within a school in the division. A member of staff of the CFL development unit also commented on how much they were able to learn from the frontrunners in online learning environments, simply because they were a bit later coming into the field. Another online initiative has drawn on ideas and lessons learnt from a virtual learning environment developed for the TAFE sector.

We need to listen carefully to the frustration of staff who try to disseminate their work and meet a wall of indifference, as described in the vignette below. As noted in chapter 8, Adoption and Collaboration, evaluation evidence is critically important in engaging colleagues.
Robert Bencini teaches Animal Science at the University of Western Australia. Her innovation was a computer-simulated animal dissection aimed at facilitating independent student learning, promoting an understanding of the link between structure and function in animals, and reducing the number of animals used in practical classes.

There was very little collaboration with other developers. We had found that most anatomy packages stopped at the anatomy level and did not explore the link between structure and function in animals which was what we wanted to highlight in our package. We believe that only if the function is understood the structure can be learned and remembered, otherwise it could only be learned by rote and consequently forgotten quickly. The Library was not involved, but their databases were consulted.

We have had enquiries from other universities in Western Australia who were given a free copy of the stack, but to our knowledge they did not adopt it.

I have the feeling that when I was away (on sabbatical in 1998) even my own colleagues did not take the stack too seriously. I suspect from students' feedback that students were just told that they had to do it. It seems to me that these developments remain with the developer and are difficult to transfer to other lecturers/courses/units.

### 9.2.4 The role of the library in dissemination

At one case study university, the library was seen as taking a leadership role in terms of electronic dissemination of information about what others are doing with CFL. This was seen to be driven by the dynamism of the university librarian.

Difficulties were experienced at several universities in finding software packages and CFL resources. Experience to date suggests that it is difficult to have access to people who can make an informed scan of other resources, to know where to look for them and evaluate them usefully. It was felt that libraries could play a role in this, with dedicated staff who spent their time looking for resources.

At another university, it was seen that it was an appropriate role for the library to manage databases. It was felt that they already had the media infrastructure and the knowledge of organising information. There was a perceived lack of critical evaluation of databases and the feeling that academics wasted time in fruitless searches. It was also felt that librarians could help to evaluate different search engines and different resource sites.
9.2.5 Publishing

Several respondents felt that there was insufficient kudos involved in disseminating information about CFL developments. There was a firm belief that people needed to be encouraged to publish findings, but that the avenues for publication were unclear.

The view was expressed that there is more status associated with the production of multimedia than in the evaluation of it. It was felt that evaluation needed to be promoted at an institutional level in a structured way. However, it was felt that more people would be willing to do it if there was something tangible to be gained from it. The view was also expressed that people need to write articles about their experiences—not just the positive, but also the problems; not just the successes, but also the unexpected failures.

In this study, an extensive literature search was carried out of conference proceedings in the educational technology area. The data in these papers is often incomplete—‘idea of the day’ rather than scholarly evidence-based reflection on projects.

In summarising this whole section, it seems that there are few policies, strategies or rewards in place to encourage developers of CFL resources to make them available to the wider academic community. Where this happens it does so by largely by personal contact or recommendations from colleagues. This is the case in the vignette below.

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Interactive prosthodontics: learning to design removable partial dentures

In our culture, life without teeth is a social and psychological disaster. Sybille Lechner of the University of Sydney has designed a multimedia program intended to simplify the complex process of designing dentures to replace lost teeth, while at the same time acknowledging the infinite variety of situations encountered in patients needing dentures. The best way to design a denture is to begin by holding models of the mouth in the hands, turning them over and around and relating them to relevant clinical and technical information. None of the many very excellent medical interactive programs on the market could be used, or even modified, to address this aspect of dentistry. The program simulates this by using Quicktime VR. There are also questions and feedback. Evaluation results are positive.

There was little collaboration with colleagues because nobody had enough time to become really involved. However, adoption elsewhere of Interactive Prosthodontics has occurred because of knowledge about the final product. Several dental schools are trialing the package, both in Australia (Universities of Adelaide and Melbourne) and internationally (Anne Arbour, Michigan; Basel, Switzerland; North Carolina, USA; Iowa, USA).
9.3 Searching: the role of databases

The case studies investigated factors relevant to databases of CFL resources across the five participant universities. Findings indicated that databases of CFL materials were not widely used, and that there were shortcomings with existing databases. Nevertheless, it was felt that databases of CFL resources could be useful if designed well. A number of features were identified which could characterise a well-designed teaching and learning database.

9.3.1 Existing teaching and learning databases

There are a number of well-designed and maintained databases in Australia in various discipline areas. A good example is AUSTLIT (Australian Literary Database) <http://www.lib.adfa.edu.au/austlit.html>. This is a computerised index of Australian literature which lists creative and critical writing by or about Australian creative authors. The computerised database is a joint product of the School of English and the University College Library at the Australian Defence Force Academy. The database contains records from the 1880s to the current day, with comprehensive coverage from 1988. The current database comprises 230 000+ records for creative and critical works. Approximately 3 000 items are added each month.

The focus in this study is on databases which contains information on resources which can be used in tertiary teaching and learning. A number of teaching and learning databases have been developed in Australia in the last 13 years. Perhaps the first was the Software and Courseware Online Reviews (SCOR) database (Winship 1986; SCOR 1998). In the mid-1990s, five discipline-based clearinghouses of teaching and learning resources were developed with funding from CAUT (Committee for the Advancement of University Teaching). The science clearinghouse, UniServe Science, has remained active with funding from the University of Sydney.

9.3.2 UniServe Science

UniServe Science <http://science.uniserve.edu.au/> based at the University of Sydney, offers a range of services to academics in the sciences. In addition to maintaining an elaborate web site consisting of a searchable database of information about teaching software, information about discipline-specific teaching resources and links to other relevant sites, UniServe Science organises and holds a range of workshops, both locally and nationally.
They also publish:

- newsletters, consisting of articles by academics throughout the country and overseas, software reviews and conference reports;
- proceedings of all workshops;
- bibliographies of discipline-specific IT materials for distribution to university departments and secondary schools; and
- QuicKards (a series of handy reference leaflets which inform about the current use of IT materials in Australian university science departments).

UniServe Science also reviews and evaluates IT materials developed inside Australia and overseas, maintains listservs on a discipline-specific basis for academics across the country, and sets up and maintains mirror sites.

UniServe Science maintains a network of contacts with science academics at the University of Sydney, at most science departments in Australia, and overseas, particularly in the UK, e.g. with the science-based centres of the Computers in Teaching Initiative (CTI) <http://www.cti.ac.uk/>.

### 9.3.3 EdNA

Arguably, the most significant database initiative in recent years, in terms of both scale and scope, is that developed by Education Network Australia (EdNA). Known as EdNA Online, this initiative was officially launched in November 1997 (as the EdNA Directory Service). It serves as an online ‘first entry-point’ for a wide range of information and resources relevant to the whole education and training sector in Australia (involving schools, vocational education and training, and higher education). The database currently holds over 8000 evaluated resources with a further 235 000 linked items available for searching. The higher education component of the Directory currently consists of 1885 ‘core’ indexed items (URLs, or ‘uniform resource locators’), approximately 50 for each Australian university. All core items indexed on the Directory are available through the browse function and any one of these links will take a user of the EdNA Directory directly to the referenced page, thus acting as a ‘gateway’ to the university.

Representatives from each sector contribute to its content and are guided by principles of quality online resource provision and shared responsibility within an environment of distributed administration.

EdNA Online is also significant in terms of its continued evolution and officials are currently engaged in the process of developing formal linkages with owners of other database collections, both nationally and internationally, for the purposes of further aggregated value. Furthermore, just as EdNA is itself a collaboration involving a diversity of stakeholders, EdNA Online also
EDNA Online currently disseminates information to users of the service via two main user-selected options—either from browsing an extensive category tree of catalogued, evaluated items, or through using the search function. Within the category tree there is provision for storage and retrieval of items associated with CFL resources, though some categories are better populated with content than others. As yet, there is not a well-developed or promoted mechanism to encourage institutions and individuals to contribute their CFL resources, though the authors are aware of a sophisticated harvesting project which is currently being tested. Probably the main challenge for EDNA Online in populating its database of CFL resources is that there is some dependency upon wide acceptance and deployment of metadata to enable harvesting and cataloguing of new resources.

9.3.4 National teaching and learning database

More recently, the New Technologies in Teaching and Learning (NeTTL) group at the University of Sydney has been funded by DETYA to produce a collaborative National Teaching and Learning Database (NTLD) which aims to be a repository of learning resource ‘objects’, of a finer granularity than resources held by EDNA Online (Koppi, Chaloupka, Llewellyn, Cheney, Clark & Fenton-Kerr 1998). These objects can include images or even parts of images and accompanying text describing three-dimensional materials used in teaching. The current scope of the items held in the National Teaching and Learning Database is very much limited to the medical field.

In some ways the naming of the NTLD has caused some confusion within the higher education sector and it is perceived as a competitive option to the aggregation of resources on EDNA Online. Competition between database providers is discussed later in this chapter.

A small number of universities are developing their own internal databases of CFL materials. Six of the 24 survey respondents to the Library section stated that they maintain a catalogue of CFL resource materials, but few details were provided. The embryonic RMIT Clearinghouse is described in chapter 3, pp. 53–55.

9.3.5 Case study results

Overall, the study revealed a fairly low level of database use by staff for furthering their knowledge of teaching and learning approaches broadly, and
CFL and online resources in particular. Staff, however, are familiar with using databases for research within their own discipline or knowledge domain.

One case study university has two small databases that are used in its CFL work: a central database of university grants and projects; and a small faculty database containing web sites, CD-Roms, stand-alone tutorial resources, reviews, summaries, licence conditions and so on.

Participants from a Law Faculty reported that electronic databases are very important in the legal field, for rulings, and cases studies, but do not seem to have much use or standing in relation to finding out about CFL resources or broader pedagogical approaches. There is relatively little CFL material available in Law and the vast majority of interviewees at this university were ignorant of any useful databases, although they reported using publishers’ databases.

There was a general response by the 81 participants in the case studies that existing databases were not particularly helpful in promoting or assisting those looking to adopt or make better use of CFL. The following section looks at some of the reasons put forward by respondents.

### 9.3.6 Reasons for low usage of databases

Most of those interviewed who had used databases reported that they found the CAUT/CUTSD clearinghouse concept didn't work well. There was a sense that the potential value that might accrue from databases was overrated. Several indicated that they certainly would not use a clearinghouse deliberately. Many existing databases were found to be not useful, containing lists of programs described according to the developer’s idea of their value. One person’s experience with submitting material to the Law clearinghouse was that it was too technically difficult to use. The ease of submitting and retrieving data was a particular concern.

An issue of considerable concern was the tension between collaboration and competition, in that databases are designed to disseminate resources and ideas, and a number of staff felt that this might compromise the competitive advantage of the university or their course.

> The issue is—I've got resources but am I prepared to allow my resources, or my institution’s resources, to be used by other universities—it’s the idea of competitive advantage.

Intellectual property was also an issue, in that some people might not want their material to be used by others. Lack of customisability was also an issue. A related concern was that material might be located on a database, but turn
out to be too expensive to purchase. On the other hand, there was also concern about disclosing too much information about a teaching initiative, in case it did not meet its specifications when finally developed.

Other staff suggested that using databases would be another ‘add-on’ to an overloaded schedule, unless it could be proven that they had immediate impact and use. Some people also reported a lack of time to browse through database materials.

Two final comments are quite illuminating. It was felt that unless there was a clear motive to use databases, and an incentive for doing so, then they would not be used widely. It was also felt that the volume of material could be daunting, unless it was well organised, with useful abstracts.

9.3.7 Factors in favour of databases of CFL resources

A number of interviewees, however, suggested that the notion of a database was a good idea: to avoid re-inventing the wheel, and to update existing knowledge of suitable resources. Several managers argued that databases offered a useful strategy to find out what was going on beyond the faculty and the university, and that it was essential that staff have access to this information. It was also felt that the database concept was particularly useful for staff located in small, regionally-based universities, with limited resources.

> Online databases are important in a small regionally dispersed university, with limited resources. If there is any resource out there which I can look up, if I find it useful, I’ll apply it.

A number of those interviewed gave in-principle support for the concept of databases, but acknowledged that there were practical problems with respect to maintaining their usefulness. A large number of interviewees had suggestions about how to design a useful database of CFL resources.

9.3.8 Desirable features of a CFL database

There was a strong response that an ideal CFL database had to be well designed, easily accessible and simple to use, unlike a publisher’s web site about which a person reported:

> I don’t want something which takes a whole lot of hours of investment of my time to learn it—then two years later you have to learn something different.

Data should be able to be submitted and retrieved with a minimum of effort. The database should include up-to-date information about copyright, and
credit (staff rewards and recognition) should be given to producers submitting their information to a database.

The ongoing support and maintenance of databases was felt to be a serious issue. Respondents were aware of databases which began with a grand management statement, but which were not resourced sufficiently beyond the initial start-up phase. Databases needed to be institutionalised with ongoing funding and infrastructure to support and maintain them. For databases to be useful, they have to remain up-to-date.

There were mixed responses on the issue of whether the database should be discipline-specific. Some people preferred a discipline-based approach, because access by topic was a logical first point of entry. The National Library of Australia site at <http://www.nla.gov.au/libraries/resource/gateways.html> provides subject gateways to a variety of disciplines: aboriginal studies, agriculture, biology, business, chemistry, education (EdNA), engineering, environmental issues and spatial data. However, several interviewees favoured a more holistic approach, wanting to get a wider perspective from other disciplines. They favoured multiple ways of entering and interrogating the database—by discipline or pedagogical approach. At a different level, one respondent wanted to see a faculty level clearinghouse as a way of sharing who is doing what, who has applied for grants, etc.

9.3.8.1 Human issues

It was felt that the human factor was important in determining the success of a database. One respondent felt that the real issue appears to be not so much the value or efficacy of the database, but how one addresses the motivations people have for using or not using them. Another interviewee wanted to see databases with a human touch, for example by including photos, quotes and personal gems rather than impersonal abstracts.

_I just think there is a place for preserving the human in this technology_

It was felt that databases might become more widely accepted if they were promoted to university staff by people who were advocates for the database. The implication was that databases must be ‘owned’ by academics, so that a critical mass of people become involved and provide the impetus to keep it going.

For a database to be successful, users must be able to determine the worth of the material in it. It was felt that someone with CFL experience would be the best person to make judgements about the worth of a resource. It was suggested that a database must be ‘more than a catalogue’ and the ultimate value of a database depends on one having enough experience to know
‘where and how to look’. It was felt that there is a role for expert reviewers
of CFL materials, rather than just the originators of the materials submitting
their own information about the CFL resource.

What was envisaged was something analogous to the search part of the
Amazon.com web site, which makes extensive use of the reviews and
comments supplied by its readers. The reviews and comments are stored on
the Amazon.com server and linked to the resource being reviewed. This
indeed was a key idea of the CAUT clearinghouses. It is important that any
new initiatives build on past experience.

It was evident from a range of responses that people saw value in associating
discourse about a CFL resource with part of the database entry. The database
entry would then be a dynamic entity, as people added more information
about how they used the resource. Such a database should demonstrate what
other people are doing, rather than products. It should highlight the different
ways in which material may be used, and present information about
evaluation of different approaches.

I'd love to use a database to know precisely what others are doing
with their students, how they are helping the interactive learning
process—whether it is dominated by multiple-choice questions and so
on. To discover how the online learning is facilitating the learning
process.

It was suggested that a new type of database could be designed. This
database would act as a resource bank similar to a university library, but
would have a distributed nature so that everyone could access it. It would be
contributed to by all (participating) universities so that all parties involved
would have a vested interest in maintaining it. The proposed database would
become a central and core resource for all universities, and its distributed
nature would minimise the likelihood that the prejudices of an individual
database owner would adversely affect its usefulness. Such a database would
provide huge cooperative possibilities, according to case study
participants.

The desirable features of a CFL database envisaged by the case study
participants are summarised below. A range of technical and policy issues
needs to be addressed before this ‘ideal’ CFL database can be realised.
1. Have a simplified data submission and retrieval process
2. Have a distributed nature
3. Be maintained in an ongoing sense
4. Be owned by academics
5. Have resources submitted by people with expertise in CFL and knowledge of the discipline, following a scholarly review process
6. Resource submission should not be by the developer of the resource
7. Contain contextual information about the resource:
   - a full description of the product;
   - the rationale behind its development;
   - its unique characteristics;
   - the pedagogical approach used;
   - intellectual property details, and how it might be obtained; and
   - evaluation data.
8. Contain a range of experiential information on how the resource was used in a real-life teaching context, both by the developer and others
9. Return the appropriate level of information to the queries submitted by users
10. Resources successfully submitted to the database would attract scholarly recognition

9.3.9 Technical aspects of web-based searches for resources

Appendix 2 introduces the concepts of Resource Sites, Search Sites, and Type 1, Type 2 and Type 3 data. Resource Sites are analogous to online library holdings, containing what we characterise as Type 1 data. A Search Site is analogous to an online library catalogue. The catalogue is characterised as Type 2 data, while the Dewey Decimal classification which defines the catalogue is analogous to Type 3 data. One online manifestation of Type 3 data is a metadata standard, such as the emergent IMS and Dublin Core standards. Metadata is data about data. Metadata describes how and when and by whom a particular set of data was collected, and how the data is formatted. Metadata is essential for understanding information stored in data warehouses.

9.3.10 Implementing an ideal database

The simple process for the dissemination of, and search for, information about CFL resources illustrated in figure 9.1 can be expanded, based on the
information provided by case study participants, and the technical aspects of web searches described in appendix 2.

Figure 9.2 An expanded process for the dissemination of, and search for, information about CFL resources

The expanded process is shown in Figure 9.2. The model attempts to take account of the range of features of an ideal database, summarised in the list above. As before, the model describes two linkages between resources and databases: dissemination of information about the resource (steps 1 to 7); and search for information about resources by interrogating a database (steps 8 to 11). The various parts of the diagram are described sequentially in the following steps.

**Dissemination**

1. The developer of a CFL resource is the owner of the Type 1 data.
2. In order to disseminate information about the resource, she or he will have to produce a description of the product, including evaluation evidence (point 7 in the list above).
3. The information describing the resource will be described as metadata, using a particular metadata standard (Type 3 data).
4. In some cases, the metadata may be submitted directly to the database, either by the use of metatags, or to a Search Site which does not utilise a refereeing process.
5. In the scenario favoured by case study participants, the information about the resource is submitted to an external scholarly review process (point 5 in the list above). If the resource is judged to be acceptable, the resource description, together with the referee’s report, is entered into the database.

6. As a result of the reviewing process, a scholarly paper about the resource may be submitted to the literature. The paper, and discussion about the paper, can be added to the resource’s metadata description. Discussion by other academics of their use of the resource is also relevant here (point 8 in the list above).

7. As a result of this dissemination process, the Type 2 data description of the resource becomes part of the database.

Search

8. The user seeking information performs a search of the database with a search engine.

9. The user makes a considered selection of the Type 2 data returned by the search, based on its metadata.

10. In order to make a final decision about the worth of the resource, the user negotiates a trial of the resource with its owner.

11. In order to use the resource for teaching and learning activities, the user must fulfil the intellectual property requirements of the resource owner.

9.3.11 The ASCILITE Links database

The ASCILITE Links database is a prototype system allowing for distributed maintenance of hypertext links within the system. Loosely based upon a Yahoo-style system, the Links database will allow ASCILITE members to moderate categories of which they have an interest or expertise. Any person can submit useful links to a particular category and even recommend a sub-category; the moderator for this area is then notified via email of links awaiting approval. The moderator provides a third-party, quality assurance role that adds value to the resources maintained within the database. Moderators for particular categories are added by the Links database administrator through a password-protected web interface.

As part of the links submission process, a user would need to complete various fields including metadata fields that will allow the resources within the ASCILITE Links database to be available from other databases such as EdNA Online. The moderator for this particular resource would be able to edit any of the fields before approving the entry for addition to the public Links database.
Maintenance of the ASCILITE Links database will be further enhanced by a automatic link checking application that will report broken or otherwise unavailable links on a regular basis to the appropriate moderator and overall system administrator. Also the total number of links for the entire system and by category and sub-category will be automatically updated and displayed providing the user with a useful overview of the resources listed within the system.

The net result of this prototype Links database is to create a searchable resource that is interoperable with other Search sites and is sustainable and credible. Lists of hypertext links to related sites are normally quite labour intensive to maintain and this hurdle can be lowered by the use of a database system described above that distributes the responsibility for maintenance across a group of enthusiasts or experts and also uses software tools to automate functions such as link checking, searching, etc. The use of third parties in managing Link categories adds to the credibility and perceived usefulness of the resources. Moderators are identified for each category within the system and their role is recognised by the Society thus providing some public kudos for their efforts.

9.3.12 Collaboration and competition

Even given the innovative design of the ASCILITE Links database, there is no reason to think that it is necessary to have only one database of CFL resources in Australia. There is already a range of databases (Search Sites) serving the sector to a greater or lesser extent. These databases, and new databases which are developed, can meet the needs of different users in different disciplines. Some institutions maintain their own databases of CFL resources.

It is healthy to have such a competition between Search Sites. Search Sites can create their own market niche, and serve a well-defined clientele. The competitive nature of the Search Sites will hinder free exchange of Type 2 data between Search Sites. However, it is obviously a waste of a scarce resource if the owners of these databases continually re-invent the wheel, and host data which is incompatible with other sites.

Search Sites can benefit from collaborating on the adoption of standards which allow interoperability between result sets. Thus, there needs to be standardisation of Type 3 data, and promotion of the adoption of metadata at a national level, in order to improve the effectiveness of Search Sites. Given that the creation of metadata will be labour intensive, it is sound business practice for Search Sites to use metadata standards which maximise the ability of people to locate their resources.
It is difficult to achieve collaboration between owners of resource databases (Search Sites) because of the apparent tension between collaboration and competition. Serving Australian education (and higher education in particular) seems to be a common goal of databases, and there seems to be a genuine goodwill to collaborate from the database owners with whom the project team has been in contact. However, there is also an element of competition between the resource database owners. This is particularly true when considering collaboration between funded activities. Because the nature of the funding is based on competitive bidding (even though the sources of funding may all ultimately derive from DETYA), the opportunities for collaboration have been highly reduced.

Our view is that competition should be about the provision of the best possible educational outcomes achievable with the funding provided by DETYA. Any behaviour which tries to block competition (educational effectiveness) by locking users into proprietary software, standards and/or practices should be discouraged. Collaboration should be sought for creating a national standard set of Type 3 data so that resources are categorised in ways that are interoperable, and which reduce the burden on Resource Sites owners when they define metadata for their resources.

9.3.13 Domain-specific issues

All subject domains have their own specific requirements and it is unlikely that any semantic standardisation can meet all the needs of every domain. In other words, domain-specific efforts in standardising metadata must remain within the domain-specific community, which is why some Dublin Core elements are extensible by additional qualifiers.

The common elements of teaching and learning databases are about ‘education’ and ‘pedagogy’, and standards for these categories will most probably be based on the IMS schema. However, there is a need to capture the domain-specific issues in the Type 2 data as well. If a teaching and learning resource database is devoted to only one subject domain, it can use a subject-specific extension to the metadata standard, such as the MetaChem standard for chemistry. The knowledge and experience of the domain-specific database owner in creating metadata may well add value the database in the view of its users. However, the domain specificity of the metadata standard may compromise the ability of the database to be searched by other sites. There is a conflict between the specificity of the data, and the need for interoperability between sites, so that, for example, a biochemist could find valuable information from a chemistry site.
Any collaborative framework must recognise this apparent contradiction and work creatively to enable a solution. One suggestion may be that the collaborative framework specifies the standard of expressing domain-specific semantics, so that cross-domain searches may be done without the search engine really understanding the semantics. In other words, such a megasearch engine would not need to understand domain-specific semantics, it would only need to be able to pass queries from users in standard format, depending on the extensive knowledge in domain-specific Search Sites to perform the domain-specific part of the search.

9.3.14 Policy implications

The web is aptly named, given that it is an ever-expanding web of interconnectedness, of networks and nodes, and rich in information resources and communications opportunities. New online initiatives are launched almost daily and, with increasing frequency, such initiatives are associated with the policies of governments. The ‘information society’ has arrived and is setting the scene for social, economic and cultural re-configuration for the new millennium. The proposed strategy of establishing a collaboration framework needs to leverage upon both the creative use of information resources and the creative use of the communication opportunities. This strategy is in line with a Commonwealth report A strategic framework for the information economy released in December 1998, which states on p. 9 that:

The private sector is driving, and will continue to drive, the transition to the information economy.

This sentence is taken out of the context of ‘the role of governments to provide an environment conducive to investment in new technology, to the formation and growth of new enterprises, and to the acquisition of information technology skills and knowledge’, but we believe the underlying principle is valid for a national strategy for enabling collaboration and competition of the provision of ‘teaching and learning resource databases’.
9.3.15 Proposed collaborative framework

The framework we are proposing for the development of a unified, Australia-wide collaborative framework for interoperable online databases is shown in diagrammatic form in figure 9.3. While our considerations have been mainly directed towards databases of CFL materials, we believe that this framework has a wider applicability. The framework is certainly beyond the scope of this report, and it will need to be supported by policy from government.

To be successful, the development of the framework needs to be a national initiative, funded appropriately, and coordinated through a suitable coordinating body. The coordinating body will need to develop standards for metadata and other Type 3 data, by leveraging off the Dublin Core and IMS standards, and working closely with other Australian interest groups, such as the Australian Library and Information Association (ALIA), the Committee of Australian University Librarians (CAUL) and the Distributed Systems Technology Centre (DSTC).

The developed standards will need to be disseminated to Search Site owners, so that they adopt the standard for their own metadata. Once standards have been adopted, Search Sites can continue to compete in the value they add to
their metadata, and in the metasearch/megasearch strategies which they develop. Roszkowski and Lukas (1998) describe an approach for linking geographically distributed collections of metadata so that they are searchable as a single collection.

The ASCILITE Links database is just one example of a database which seeks to provide a more effective dissemination of information about CFL materials, in the way identified by participants in this study.

This report recommends that DETYA support the development of the high level technical framework which

• is implementable;
• encourages open discussion with the various Search Sites owners (teaching and learning resource database owners in particular) to strive to achieve interoperability between their sites;
• develops standards of Type 3 data to ensure inter-exchange of metadata between different domain-specific teaching and learning Resource Databases, by working with the various domain communities;
• works with other DETYA or ANTA-funded bodies (e.g. Propagate Institute <http://www.propogate.net>; AEShareNet <http://www.aesharen.net.edu.au>) to establish standards and encourage adoption of such standards for resolving intellectual property issues, with the aim of creating of a market for learning artifacts; and
• ensures that all standards are interoperable with emerging international standards.

Professional organisations, such as ASCILITE, can also participate in this national framework of collaboration in areas such as:

• educating the academic community about the need to provide metadata;
• providing pedagogical and educational design advice in the formulation of standards;
• providing a testbed for the implementation of the standards; and
• evaluating the effectiveness of the standards and the impact of the standards on the quality of education.

DETYA could also initiate research to investigate the feasibility of a market for teaching and learning resources, the effect of such a learning artifact market on the cost of production of education content and the quality of education content so produced how to seed such a market (if desirable).

The report recommends that DETYA address intellectual property issues associated with the emergent use of metadata and metadata standards. These include the ownership of the metadata and compilations of metadata, as well
as ownership of Type 3 data associated with metadata, fair use exception clauses and moral rights.

It is our belief that the concept of collaboration can enhance the diversity of the Australian higher education sector and their ability to compete for Australian and international markets. It is this collaborative aspect that we believe can ensure the success of a distributed database model when the development of individual databases has had limited success.

### 9.4 Conclusion

We have presented a theoretical framework which identifies Type 2 data as the primary asset of any teaching and learning resource database. Any collaborative framework which compromises the ownership of such assets is not likely to be accepted by database owners. We have also recognized the useful purpose these databases serve in promoting the digital transformation of education in the information age and improving the quality of education.

The size of the Australian education sector does not allow the continual re-invention of the wheel. A collaborative approach to the development of national metadata standards and web-based search strategies is needed. Only through this synergy will competitive use be able to be made of CFL resources developed at great expense within the sector.

We have recommended that DETYA consider the proposed collaborative framework. It is not pre-emptive, but serves to illustrate that a solution does exist to meet the challenge of apparent dichotomy of collaboration and competition. An open, continual dialogue between the government, the ASCILITE executive, EdNA’s community, various teaching and learning resource database owners and the broader education community will provide an innovative solution to meet the challenges ahead.
Appendix A: Intellectual property issues

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A.1 The purpose and scope of copyright

1.1 In order to understand the operation of copyright law it is necessary to have some appreciation of the rationales which govern its operation. Two distinct rationales are usually posited and, although neither fully explain the content and operation of copyright law, there is value in attempting to view copyright law from the perspectives which they confer.

1.2 One rationale, usually known as the public benefit or utilitarian rationale, has it that copyright is granted in order to encourage innovation in cultural, artistic and scholarly endeavour because such innovation is essential to the process of social and economic development which, in turn, benefits society as a whole.

1.3 The other rationale, usually known as the natural rights rationale, asserts that copyright is based upon giving creators of cultural, artistic and scholarly works their just and natural reward for the production of such works.

1.4 Current copyright law is far more dependent on the utilitarian rationale than upon than upon the natural rights rationale.¹ In the United States, which is a highly influential jurisdiction in terms of the normative development of this area of law, the utilitarian rationale is exclusively prescribed as the basis of copyright law.

1.5 Nevertheless, while theoretically distinct, the two rationales have a tendency to merge. This tendency is based on the notion that what one

is given by law (under the public benefit rational) one must have deserved to have been given (under the natural rights rationale). This gives rise to the misconception that the purpose of copyright law is to reward creative endeavour. Rather the purpose of copyright law should be regarded as the encouragement of creative endeavour.

1.6 Copyright law’s method of encouragement is to give an economic right to those who have invested some creative work labour or skill to prevent others from using that work in certain ways. In order to strike a balance between the rights of creators and the interest of the general public in ensuring access to the work and thereby promoting the economic and social benefit said to result from the production of creative works, the economic interests in copyright are subject to certain exceptions. These are discussed in para 4.4.

1.7 There are a number of areas of creative endeavour in which the grant of an economic right in the nature of copyright cannot clearly be regarded as the primary motivation to intellectual creation. Amongst these areas may be included the production of works of scholarship by university academics. With very few exceptions, the financial rewards derived from the copyright in such works are negligible. Rather, motivations for creation may include the desire to contribute to the scholarly community and career advancement based upon publication record. While this does not preclude the need to settle the issue of copyright ownership and exploitation, it does suggest that there may be methods, other than the grant of copyright, to reward innovators in the online tertiary educational environment. In this respect attention should also be given to the issue of the moral rights of creators (see para 5).

1.8 Notwithstanding the foregoing observations, for the purposes of this report it is noted that there is a perception that the production of online teaching materials may generate a more lucrative market than the production of traditional scholarly works with an accompanying concern about the equitable distribution of the profits from copyright exploitation.

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A.2  Protectable subject matter

2.1  Introduction

2.1.1  Copyright protection arises automatically once a work has been committed to material form. The concept of material form includes the process of electronic storage. However, copyright can only reside in a work which falls within one of the classes of protectable works within the Copyright Act 1968. It is also possible that a protectable work may incorporate other underlying protectable works.

2.1.2  In the online environment there are a number of different types of protectable works which are relevant to copyright protection or licensing. The following paragraphs identify these works and explain their relevance. (The issue of the ownership of copyright in these works is dealt with in para 3.) It should be noted that in the case of each of these types of works unauthorised reproduction or use of the work in online materials will be a breach of copyright unless the reproduction is subject to an exception. (Exceptions are discussed in para 4.4.)

2.2  Literary works

2.2.1  Any written text is capable of being a copyright work. This includes text written for the purpose of online teaching materials.

2.2.2  The copyright in such works lasts for at least fifty years from the author’s death.

2.3  Artistic works

2.3.1  The Copyright Act protects a number of different types of works within the general category of the visual arts. Protected works relevant in the online environment, are paintings, sculptures, drawings, engravings, photographs and, possibly, models of buildings.

2.3.2  Such works may be created for the purpose of an online educational package or they may be reproduced for this purpose.

2.3.3  The copyright in such works, other than photographs, lasts for at least fifty years from the author’s death.

2.3.4  The copyright in photographs lasts for fifty years from the year of first publication.

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3  See Copyright Act 1968 (Cth), ss 22 & 10(1).
2.4 **Musical works**

2.4.1 Musical works are protected by copyright, irrespective of whether they have been committed to material form by being written in the form of musical notation or by being recorded in any way. (Note that the words of songs are protected as a literary work.)

2.4.2 As with the other types of protectable works mentioned, such works may be created for the purpose of an online educational package or they may be reproduced for this purpose.

2.4.3 The copyright in such works lasts for at least fifty years from the death of the author.

2.5 **Sound recordings**

2.5.1 Any type of recordings of any sounds are protected by copyright.

2.5.2 Such works may be created for the purpose of an online package or reproduced as part of such a package.

2.5.3 The copyright in sound recordings lasts for fifty years from the year of first publication.

2.6 **Computer programs**

2.6.1 Computer programs are protected by copyright law as literary works. Accordingly the same basic rules apply to their creation and use as apply to the creation and use of other literary works (see para 2.2). Amongst other things, this means that a computer program may not be used to run an online package without the authorisation of the copyright owner.

2.6.2 The *Copyright Amendment (Digital Agenda) Bill* proposes certain changes to the protection of computer programs. These are discussed in para 4.7.

2.7 **Films**

2.7.1 The aggregate of visual images and sounds generated by playing video/computer games involving computer generated images are

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A computer program is defined in the *Copyright Act 1968* (Cth), s 10(1) as meaning ‘an expression in any language, code or notation, of a set of instructions (whether with or without related information) intended, either directly or after either or both of the following:

(a) conversion to another language, code or notation;

(b) reproduction in a different material form;

to cause a device having digital information processing capabilities to perform a particular function’.

capable of being protected under copyright law as a film. This suggests that it may be the case that the aggregate of the visual images and sounds generated by at least some types of interactive multimedia teaching packages are capable of being protected under copyright law as films. This matter is, however, subject to some controversy and must be regarded as unsettled under Australian law.

2.7.2 The copyright in films lasts for fifty years from the year of first publication.

2.8 Compilations

2.8.1 Compilations of computer programs or compilations expressed in words, figures or symbols are protected as literary works under copyright law. (On the protection of literary works, see para 2.2.)

2.8.2 This means that, under certain circumstances, the compilation of other people's works in an online teaching package may attract copyright protection. It appears that this will be the case where the compiler has exercised ‘skill, judgment and labour’. Compilations made on the basis of a distinctive or original perspective would appear to fall within the scope of this concept.

2.9 Adaptations

2.9.1 As discussed in para 4.1.3, to adapt someone else's copyright work without authorisation amounts to an infringement of the copyright in that work unless the act of adaptation is subject to an exception.

2.9.2 Although it is not clearly settled under Australian law, it appears to be the case, however, that where the adaptation involves the contribution of new material by the adaptor, a new copyright interest may arise in the adaptation. Thus the adaptation of a work may involve both an infringement of copyright and the creation of a new copyright work.

2.9.3 The type of new copyright work created will depend upon the nature of the adaptation. However, in the online educational context the work is likely to fall within one of the above categories. The duration of copyright will depend upon the type of work.

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6 Ladbroke (Football) Ltd v William Hill (Football) Ltd [1964] 1 WLR 273.
A.3 Ownership of copyright

3.1 Position at general law

3.1.1 The Copyright Act provides that the first owner of copyright in a work is the author of the work. In relation to literary, dramatic, musical and artistic works, the author of the work is the creator of that work.

3.1.2 However, the Copyright Act makes two qualifications to this principle which are relevant in the present context. One of these qualifications provides that the issue of ownership of a copyright work can be altered by agreement. The relevance of this matter will be considered in para 3.3.

3.1.3 The second important qualification to the general principle on ownership laid down by the Copyright Act is that where a literary, dramatic, musical or artistic work is made by an author ‘in pursuance of the terms of his or her employment by another person under a contract of service’ then the copyright in the work will belong to the employer. In assessing how this applies to copyright works created by academics employed by universities it is necessary to have regard to the case law which interprets the meaning of the above-quoted expression in the Copyright Act.

3.1.4 In relation to university academics employed under a normal contract of employment, this question is unresolved. While such academics will be properly regarded as being employed under a contract of service, the question of the scope of that contract of employment is unclear. In other words it is not clear that academic authors are employed to create copyright works and can, therefore, be regarded as creating them in pursuance of the terms of their employment as required by the Copyright Act (see para 3.1.3). There is, however, a very considerable body of legal opinion to the effect that, apart from explicit contractual provisions, academics retain the copyright in the material which they create.

3.1.5 An area of case law in which the position is much clearer relates to people who are not university employees, but might be better characterised as external contractors (that is, employed to complete a specific and defined task). In the university online environment, where copyright works are created by external contractors then, provided there is no contractual stipulation to the contrary, they retain the

7 Copyright Act 1968 (Cth), s 35(6)
copyright in their work. The only exception to this proposition is in relation to commissioned photographs, portraits or engravings. The copyright in these items will, subject to any contractual provision to the contrary, belong to the commissioner.

3.1.6 In the case of sound-recordings, the first owner of copyright in the sound recording is the person who owns the item upon or in which the sound recording is first made. The exception to this proposition is that where the sound recording is made in pursuance of a commission, the commissioner owns the copyright. In the university online environment, it may well be that where online materials are developed for teaching using university resources, that any sound recording made for these purposes is made on or in an item (e.g. disk, tape etc) which is owned by the university. In this case, the copyright in the sound recording will belong to the university. Further, where an external contractor makes a sound recording for the purposes of an online teaching package, it will be necessary to consider whether this is created pursuant to the terms of a commission. If so, then if the university is the commissioner it will own the copyright.

3.1.7 In the case of films, the first owner of copyright in the film is the person who makes the arrangements necessary for making the film. Like sound recordings this is subject to an exception in favour of commissioned works. In the university online environment, the maker of a film (which may include the sounds and images produced by an interactive multimedia package, see para 2.7) will nearly always be an individual who will, therefore, retain copyright in the film, unless the film is made pursuant to a commission.

3.1.8 Finally, it should be noted that the copyright in any work can be assigned or licensed to any other person.

3.2 Joint authorship

3.2.1 As is evident from the foregoing discussion, it may very well be the case that a number of different copyright works, created and owned by a number of different people, are comprised in one online teaching package.

3.2.2 Where the contribution of each author is separate and identifiable then either the copyright owner of each work must authorise by licence the exploitation of the work, or the ownership in all the copyright works must be assigned to one entity.

3.2.3 In the present context this means, for example, that where a computer program is necessary in order to run a package then the entity which
wishes to exploit or use the package must obtain a licence or assignment from the entity which owns the copyright in the program.

3.2.4 In the case of collaborative research between individuals at two or more universities which produces an online package it will be necessary to do the following: first, identify the different copyright works which make up the package; secondly, identify the owners of each copyright work; thirdly, ensure that all copyright owners authorise use or exploitation of the package. Where any of the copyright works which make up the package or the putting together of the package itself (on the basis that it will be protected as a compilation, see para 2.8) are the result of collaboration in which the contribution of each collaborator is not separate and distinct then the authorisation of all relevant copyright owners will be necessary.

3.2.5 The issue of whether individual creators or collaborators or their respective university employers are the owners of the copyright in any particular work making up an online package may be determinable by reference to their university statute.

3.3 Effect of university statutes

3.3.1 University statutes on intellectual property generally purport to operate on the basis that their provisions are implied into the contracts of employment of staff members. This method of incorporation seems relatively uncontroversial in relation to staff members whose current contract of employment was entered into after the passing of the relevant statute. However, in relation to staff members whose contract of employment was entered into prior to the passing of the intellectual property statute, an argument may exist (depending on the precise wording of the contract of employment) that any attempt to incorporate the provisions of the intellectual property statute into the contract of employment amounts to a unilateral alteration to the contract of employment which is unenforceable. Notwithstanding, this issue the following paragraphs treat the relevant university statutes as if they constitute part of the contract between the university and its employees.

3.3.2 Four university statutes, available online, were considered in order to determine their impact on the question of the ownership of copyright in online teaching materials. These universities were: Curtin University of Technology, Edith Cowan University, Murdoch University and the University of South Australia.

3.3.3 The intellectual property statutes of Murdoch University and the University of South Australia make a distinction between the copyright
existing in ‘conventional scholarly output’ by academic staff members and the copyright existing in other works produced for the purposes of the university. Murdoch University waives any copyright it might otherwise have in conventional scholarly output. The University of South Australia claims that it will not normally exercise ownership rights over conventional scholarly output, except that it claims the right to use such work for university teaching and research purposes.

3.3.4 Under the dichotomy in Murdoch University’s statute between conventional scholarly output and teaching materials, it seems more likely than an online teaching package would fall within the latter characterisation. It is noted that there is arguably a difference between ‘teaching materials’ and the substantial original and creative effort which may be put into the creation of an online teaching package. Nevertheless the concept of teaching materials seems to be quite wide. In the situation where an academic staff member produces teaching materials, including an online teaching package, not for the purpose of the university but for the purposes of commercial exploitation it is arguable that such material falls outside the concept of teaching materials in the statute. Nevertheless, it may still fall within the ambit of intellectual property in relation to which the university is claiming ownership where the university has contributed ‘resources, facilities, apparatus, supervision, salary or other funding’.

3.3.5 The University of SA policy is less detailed on these issues than the Murdoch policy. It asserts ownership over intellectual property produced by university activities of staff members and activities ‘which use the University’s name or letterhead, University staff, equipment, facilities, materials, accommodation or intellectual property without proper reimbursement to the university’, subject to the rider that it will not enforce ownership in relation to conventional scholarly output. University activities include teaching and curriculum development, collaborative research, commercial research and consultancies. So far as online teaching packages are concerned, the most likely conclusion is that the intellectual property rights in those packages will be owned by the university.

3.3.6 Edith Cowan University (ECU) claims copyright in intellectual property ‘created by staff in the course of their employment’. The ECU policy further states it will not assert ownership of the ‘copyright in books, articles, lectures or other written work’ other than such works specifically commissioned by the university, nor will it assert ownership in ‘computer-related work’ other than computer programs. It does, however, assert ownership of the copyright in ‘lecture notes, courses, radio broadcasts, audio visual material and multimedia material
specifically commissioned by the University’. The fact that ECU does not assert ownership in computer-related work, other than computer programs and does not appear to assert ownership in multimedia works which have not been specifically commissioned by the university may lead to the conclusion that the university will not assert copyright in at least some online teaching packages which have not been specifically commissioned. However, there are two reasons for viewing such a conclusion with caution. First, as already mentioned, the ECU policy has a general catch-all provision asserting copyright in all intellectual property created in the course of employment. (Admittedly, the precise meaning of the expression ‘course of employment’ is uncertain.) Secondly, an online teaching package may contain underlying copyright works such as the text of lectures, which is copyright material in which the university is clearly asserting its copyright interest. In a case such as this, even if the university does not own the overall copyright in the package a licence may be needed from the university in order to exploit the package as a whole.

3.3.7 Curtin University asserts the ownership of copyright in all copyright work developed by staff members in the course of their duties. However, the policy provides that ‘in order to encourage staff members to consider publication of their original work through commercial publishing houses, the University will generally assign its interests in such copyright to the staff members concerned provided the use of such copyright for teaching purposes is safeguarded’. Consistently with this approach, the University suggests that it will ‘adopt a liberal attitude to the inclusion of course material in any text books which staff members may wish to write in their own time at their own expense’. It is not clear whether the same liberal approach would apply to the inclusion of university teaching materials in an online teaching package. While one would have thought such inclusion would be in the spirit of the policy, it is not strictly within its text.

3.3.8 Each of the four universities considered here has provisions concerning equitable remuneration to staff who are creators of works giving rise to intellectual property rights in the event that the university decides that it wishes to commercially exploit intellectual property in which it is asserting ownership.

3.3.9 The ECU intellectual property policy provides that if the university does not intend to seek intellectual property protection the ‘originator’ may seek a licence to exploit the intellectual property from the university. This provision does not appear to relate to copyright, as the copyright material arises automatically. Murdoch University has a similar provision. Thus, it seems that neither the ECU policy nor the Murdoch
Statute contain any provision requiring the university to permit commercial exploitation by a staff member who has created a copyright work in circumstances where the university asserts ownership of the intellectual property but declines to engage in commercial exploitation. This also appears to be the case in relation to the University of SA.

3.3.10 Consistently with its intellectual property policy, Curtin University staff members may apply to the university to have the copyright in course materials or other copyright rights produced by them in the course of their duties assigned to them. However, where the copyright works in question are commercially exploited the university and staff member must agree on apportionment of revenue.

A.4 Exclusive rights of copyright owner

4.1 Content of exclusive rights

4.1.1 The owner of copyright has certain exclusive rights, to prevent others from doing, without authorisation, certain acts in relation to the copyright work or a substantial part of it.

4.1.2 Copyright holders have a number of different exclusive rights, depending upon the nature of the copyright work in question. Thus, to copy a film or sound recording or a substantial part thereof without authorisation will be an infringement of the copyright in that work. Likewise, amongst other things, to reproduce in any material form (which includes digital or electronic reproduction) or to publish a literary, musical or artistic work or a substantial part thereof will be an infringement of the copyright in that work.

4.1.3 It is also the case that to adapt another’s copyright literary or musical work without authorisation will amount to a copyright infringement. In relation to literary works, adapting the work includes translating it. In relation to computer programs, an adaptation means creating ‘a version of the work (whether or not in the language, code or notation in which the work was originally expressed) not being a reproduction of the work’.9 In relation to a musical work, an adaptation means an arrangement or transcription of the work.

4.1.4 This means that, for example, the amalgamation and modification of computer programs for the purposes of the creation of an online package will, if it is done without the consent of the copyright owner of the computer program, be likely to amount to an infringement of the copyright in the programs either because it amounts to a
reproduction of a substantial part or because it amounts to an
adaptation of a substantial part. It seems that this is the case even if the
amalgamated or modified work gives rise to a new copyright work (see
para 2.8).

4.1.5 The issue of whether a substantial part of a copyright work has been
taken so as to result in an infringement is assessed on the basis of a
qualitative rather than a quantitative test. In a nutshell, if an identifiable
part of the work has been taken then it will probably be regarded as
the taking of a substantial part. This will be so even if it is only a very
small part of the work in quantitative terms.

4.1.6 In relation to a compilation, however, these principles mean that it will
often be necessary to take a quantitatively significant part of a
compilation in order to infringe the copyright in the compilation itself.
The work, labour and skill of the compiler, as such, must be annexed
before copyright in the compilation is breached (even though the
copyright interests in the individual copyright works which make up
the compilation may be breached by taking a small but substantial part
of any of them without authorisation). This is relevant where a
copyright interest is being asserted in an online package on the basis
that it is a compilation within the meaning of the definition of literary
work (see para 2.2).

4.1.7 Other exclusive rights of the copyright holder include, at present, the
right to broadcast the copyright work and the right to transmit it to
subscribers to a diffusion service. While potentially important in the
context of online delivery, these exclusive rights have not been
considered in this paper. The reason for this is that the government
intends to remove these rights and replace them with a new right of
communication to the public. As this new right is part of the
government’s intended reforms to deal with copyright in the digital
environment, it is considered in para 4.2.

4.2 The digital environment

4.2.1 The Copyright Amendment (Digital Agenda) Bill 1999 is intended to
amend the present Copyright Act in order to deal with issues arising in
copyright law as a consequence of digitisation and the new
communication technologies. The Bill was released for public comment
on 26 February 1999 and is presently being redrafted to take into
account the submissions made.

9 Copyright Act 1968 (Cth), s 10(1)
4.2.2 In the Exposure Draft and Commentary to the Bill the government claims that the aim of the reforms in the Bill ‘is to ensure that copyright law continues to promote creative endeavour whilst allowing reasonable access to copyright material on the Internet and through new communications technology’. This is said to be ‘a key component of the Government’s overall commitment to encouraging the growth of the information economy’.10

4.2.3 The centrepiece of the reforms is a new exclusive right of communication to the public, which subsumes the exclusive rights to broadcast and to transmit to subscribers to a diffusion service.

4.2.4 This new right will apply to literary, dramatic, musical & artistic works, and to sound recordings, films, and broadcasts. The right is not intended to be technology-specific, but by virtue of the new definition of ‘communicate’, it only applies to electronic transmission or making available online. Also, as a consequence of a new definition of ‘to the public’ it gives exclusive rights to the copyright holder in relation to transmissions intended for the public either in Australia or outside Australia.

4.2.5 This new right of communication to the public will make it clear that, for example, any unauthorised uploading of material to the web, or any unauthorised digitisation of the material for the purpose of communicating it to the public, will be a breach of copyright in the material and all its constituent parts. It is already clear that unauthorised downloading of copyright material on the web by printing it out or by copying it to disk will be an infringement of copyright.

4.2.6 The exceptions to the right of communication to the public are intended to reflect the balance already struck in the Act between owners and users of traditional print material.11 The exceptions which are likely to be relevant in the context of online teaching packages are discussed in para 4.4.

4.2.7 The Copyright Amendment (Digital Agenda) Bill also contains certain provisions designed to improve the protection of computer software. These amendments include the following:

\[A \text{ more comprehensive definition of computer program. Under these proposed amendments a computer program will be defined to mean a set of instructions or instructions to be used directly or indirectly in a computer in order to bring about a certain result.}\]

10 Digital Agenda Copyright Amendments: Exposure Draft and Commentary (February 1999), para 4.
A clarification of existing law to make it clear that a conversion of a computer program from source code to object code, and vice versa, will be a reproduction of that program and therefore an infringement of the copyright in it.

Incidental copying for normal use (eg. copying onto the hard disk of a computer) of the program will not be an infringement.

4.2.8 Finally, it should be noted that there is a perception that copyright interests, especially in the context of the digital environment are not able to be adequately enforced. As a consequence of this the Attorney General’s has recently announced the establishment of an enquiry into copyright enforcement.

4.3 Linking

4.3.1 The issue of whether unauthorised linking to another Internet site amounts to a copyright infringement is an unsettled question under Australian copyright law.

4.3.2 Concerns have been raised that linking to another site, with or without authorisation, may implicate the entity establishing the link in breaches of other rights which occur on the linked site. The most obvious areas of concern here are liability for copyright infringements on the linked site and liability for defamatory material appearing on the linked site.

4.4 Relevant exemptions

4.4.1 The Copyright Act provides that the rights of copyright holders are subject to certain exemptions. These exemptions allow for royalty free copying without the need for any authorisation from the copyright owner.

4.4.2 In the context of the creation of online teaching packages, the exemptions most likely to be relevant are the fair dealing exemptions for research and study and, possibly, for criticism or review, and the exemptions for educational institutions. These exemptions will also apply with some modifications under the new right of communication to the public (see paras 4.2.3–4.2.5).

4.4.3 The fair dealing exceptions allow the taking of parts of a work for specific purposes (including those mentioned in para 4.4.2), subject to a wide range of limitations. In particular, these limitations mean that substantial amounts of a work in quantitative terms cannot usually be taken under these exemptions and that any use of the work or the

11 Ibid, para 30.
portion of it taken cannot interfere with the legitimate market of the copyright holder.

4.4.4 In the online teaching environment these restrictions will be likely to mean that copying of other copyright works which is done for the purpose of creating a teaching package will almost never be able to fall within the research and study exception as this exception only applies where the copying is done for such purposes by the person doing the research and study (that is, the student).

4.4.5 There is some scope for the operation of the fair dealing exemption for criticism and review, however where material is being copied for the purposes of creating an online package to be commercially exploited the amount taken without authorisation from another copyright work would have to be small in proportion to the work as a whole and in proportion to contents of a package as a whole. Further, acknowledgement of the source of the work copied is required. Short quotations, for example, would be likely to fall within the exemption provide.

4.4.6 Inclusion of extracts of copyright literary, dramatic, musical and artistic works in collections for use by places of education will not amount to copyright infringement in certain limited cases. It is not clear whether this would apply to inclusion of extracts in online teaching packages since to fall within the exception the extracts must be contained in a book, sound recording or film. An online teaching package may very well not fall within any of these characterisations.

4.5 Licensing

4.5.1 The foregoing discussion has shown that in most cases use of other copyright work in the creation of an online teaching package will require the payment of royalties under existing statutory licensing schemes or will need to be licensed separately.

4.5.2 Part VB of the Copyright Act allows reproduction in certain cases for the purpose of using copyright works in educational institutions subject to the payment of royalties. These provisions do not relate to all types of copyright works and, at their broadest, only encompass reproduction from literary, dramatic, musical and artistic works. It should be noted, however, that they do not relate to any type of reproduction or infringing use of a computer program. This means, for example, that where a computer program is sought to be used in developing an online package a licence must be sought.

4.5.3 The Copyright Amendment (Digital Agenda) Bill proposes to clarify the application of Part VB of the Copyright Act to activities undertaken in the digital environment. Accordingly it is proposed that
the statutory licence in Part VB be extended to allow: first, the
electronic copies of copyright works presently falling within in Part VB
for the purposes of educational institutions; and secondly, the
communication of copyright works presently falling within Part VB to
students in electronic or digital form.

4.5.4 Where reproduction of copyright works for the purpose of developing
an online teaching package does not fall within the statutory licence
scheme for copying in educational institutions then it will be necessary
to obtain a licence for that copying. Depending on the type of
copyright work in question and the intended use of it, it may be
possible to obtain a licence under one of the collective licensing
schemes operated by the copyright collecting societies. Where this is
not possible then it will be necessary to seek an individual licence.

4.5.5 Under commission from the Imago Cooperative Multimedia Centre, the
Asia Pacific Intellectual Property Law Institute is currently designing a
guide to the licensing of copyright material for use in multimedia
works. Once this guide is complete it will be accessible from the Asia
Pacific Intellectual Property Law Institute Website

A.5 Moral rights

5.1 It is expected that Australia will introduce its delayed moral rights
legislation during the course of this year.

5.2 This legislation will give the authors of copyright literary, dramatic,
musical and artistic works and the producers and directors of films the
following moral rights:

- the right to be known as the author of a work (the right of
  attribution);
- the right not to have works of which they are not the author falsely
  attributed to them (the right against false attribution);
- the right to object to certain derogatory distortions, mutilations or
  alterations to the work (the right of integrity of authorship).

5.3 These rights will be enjoyed by the creators of copyright material
which is used in online teaching packages. It also seems to be the case
that moral rights will be enjoyed in relation to the overall online
teaching package if it can correctly be regarded as a compilation (see
para 2.8) or (more dubiously) if the images it generates can be
regarded as a film (see para 2.7).
5.4 The moral rights have the same duration as the copyright interest in the relevant work.

5.5 The moral rights may be waived (in return for economic benefit or not). They may not, however, be assigned.

A.6 Offshore and jurisdictional issues

6.1 As a general proposition the jurisdiction where the act of infringement of a copyright interest takes place is the jurisdiction in which copyright must be enforced. It is usually that jurisdiction’s copyright law which will apply.

6.2 It should be noted, however, that due to the very high level of internationalisation of copyright law it is not generally a problem for an Australian citizen or resident to enforce their copyright in another jurisdiction. For the same reason, there is also substantial similarity in the content of copyright law internationally. Nevertheless, the international copyright community is still in the process of formulating a response to the problems for copyright posed by the digital environment. This means that, notwithstanding the conclusion of a new treaty, there is likely to be a period during which national laws on copyright in the digital environment lack harmony.

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12 The WIPO Copyright Treaty 1996.
Appendix B: Technical aspects of web-based searches for resources

B.1 Introduction

It is relevant to consider a range of technical issues about searching for resources on the web. It is helpful to begin by considering the similarities with a physical library.

A library holds resources, such as manuscripts and journals. The defining characteristic of these resources is that they contain materials with which people engage—content. The data which makes up the content is characterised here as **Type 1** data. On the web, Type 1 data are also resources, but the range of resource types is more diverse. The analogy to a library holding on the web is a **Resource Site**.

The difference between a library and the web is that in a library the resources are usually physically close, and their location and characteristics are well-defined. This is not the case with the web, which is like a library with millions of rooms, each with a number of ‘collections’. Not all collections are clearly labelled, and even when they are, they may be labelled in a way unique to each room.

In a real library, one usually finds a resource by looking it up in the library catalogue. The catalogue contains information about the physical location (room and shelf) where the resource may be found. The data which makes up the library catalogue is characterised here as **Type 2** data. On the web, Type 2 data are provided by search engines. The analogy to a library catalogue is a **Search Site**.

Libraries long ago decided that standardised systems would enable people to locate resources more efficiently; hence the Dewey Decimal classification and Library of Congress subject heading schemes were established. These schemes established rules by which Type 2 data could be organised to aid searching. These are characterised here as **Type 3** data. On the web, one instance of Type 3 data is the metadata concept (see below).

While acknowledging the similarities between physical libraries and (teaching and learning) resources on the web, there are also significant differences.
• Unlike libraries, where holdings and catalogues are maintained at the same site, Resource Sites and Search Sites are independent entities, with two important implications:
  – The owner of a Resource Site has no obligation to notify Search Sites about changes to the resource. In fact, the Resource Site owners may not even know that a Search Site has exposed their Resource Site to Internet users by hyperlinking the resource within search results. This may lead to a ‘now it is here, now it is not’ situation.
  – There is very little incentive (if any) for a Resource Site owner to provide a proper description of the resource, even if they had the skill to do that correctly.
• Digital information can be reproduced at almost zero marginal cost. Unlike a library with physical holdings, the availability of a resource on the web only depends on the existence of the material. Copyright, therefore, becomes an issue, as discussed in chapter 5, Policy.
• The hyperlinking inherent in the web hides the location of a data resource. When a Search Site finds a resource matching the search criteria, hyperlinks give the illusion that the resource actually originated at the Search Site.

B.2 The anatomy of search sites—a data model

Teaching and Learning Resource Databases are generally not Resource Sites, because they do not hold nor store the teaching and learning resources. Instead, these databases provide reasonably effective mechanisms for their users to discover useful and relevant teaching and learning resources. Teaching and Learning Resource Databases are Search Sites.

The logical structure of a Search Site is illustrated in figure A2.1. The functionality of Search Sites can be logically divided into three operations: gathering, indexing and reporting.
Search Sites require mechanisms for locating resources (gathering). Some commercial sites (e.g. Yahoo!) depend on manual discovery of resources and encourage users to suggest resources. Other Search Sites (e.g. Alta Vista) send out software robots, known as ‘spiders’ or ‘crawlers’ to collect resources by following hyperlinks on documents (label 1 of figure A2.1). These robots locate web resources (Type 1 data) for further processing.

While some projects endeavour to store a snapshot of all currently available web resources, it is generally impossible for Search Sites to physically host all Type 1 data, because of the space implications of duplicating the files. Therefore, Search Sites generally create indexes from the gathered Type 1 data (label 2 of figure A2.1). The Type 2 data (locations and descriptions of resources) stored in the index is used to create a report when a user submits search criteria (labels 3 and 4 of figure A2.1). Users then have the option of retrieving the resource from the Resource Site (label 5 of figure A2.1).

In summary, instead of going out into the web to locate resources, by methodically exploring all Type 1 data, Search Sites scan the Type 2 data created by their robot(s) in order to find matching resources, and then report this to the user.

Table B 2.1 specifies clearly the conceptual differences between the three different types of data.
Table B2.1  Definitions of the three different conceptual types of data on web sites

<table>
<thead>
<tr>
<th>Type 1 data</th>
<th>Type 1 data are resources in which users are interested. CFL resources are Type 1 data stored on Resource Sites. (In some ways, Type 2 and Type 3 data are themselves Type 1 data, because they are resources on the web.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type 2 data</td>
<td>Type 2 data are derived directly from Type 1 data. They are locations and descriptions of Type 1 resources. There are two main subtypes of Type 2 data: indexes and metadata (see below). The size and comprehensiveness of Type 2 data, and the relevancy of the collection to the site’s users are the primary assets of a Search Site. It is unlikely that any collaborative framework that jeopardises the ownership of Type 2 data will be supported by Search Sites.</td>
</tr>
<tr>
<td>Type 3 data</td>
<td>Type 3 data cannot be derived from a single piece of Type 1 or Type 2 data. Instead, it is meta-meta information, like the Dewey Decimal classification scheme. Type 3 data includes the data that describes hyperlinks between documents; various metadata standards, such as the Dublin core and IMS standards; the usage logs in proxy servers about web pages; and the popularity rating of a web page among similar pages. Type 3 data are typically associated with a group of resources, identifying the relationships between resources. Type 3 data is analogous to the telephone. One telephone has limited functionality, but a collection of telephones enables communication and collaboration.</td>
</tr>
</tbody>
</table>

B.3 Metadata

Many teaching and learning resources are not text-based, or may not have embedded hyperlinks, making the production of indexes through the gathering process a real challenge. It is necessary to have other mechanisms of describing such resources.

Technically speaking, indexes are inverted text indexes of HTML (or text) pages. Search Sites can produce a list of all the words found in a resource, removing all common words which may not be characteristic of the resource (such as ‘a’, ‘an’, ‘the’, ‘is’) and storing them in computer-readable format. When a user submits a keyword query, the keyword is matched against such word lists and the resources that contain the keyword are returned as the search result.

However, some Resource Site owners add their own descriptive keywords (metadata) to their resources, and some commercial Search Sites search on this metadata. Metadata is defined by (Milstead & Feldman 1997) as ‘…data about data. It describes the attributes and contents of an original document or work’. The DESIRE project (IBM 1998) describes metadata as ‘data associated with objects which relieves their potential users of having to have full advance knowledge of their existence and characteristics’.

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Metadata can be either embedded within the resource or stored separately in a database. It is typically authored by humans and is represented in some standard format, such as the Dublin Core <http://purl.oclc.org/dc/> or IMS <http://www.imsproject.org/> metadata specifications. Metadata is often represented in machine readable format, such as metatags in HTML documents or the Resource Description Framework (RDF) specification (Mason & Ip 1998). Table A2.2 compares the functionality of the index and metadata forms of Type 2 data, showing the advantages possible with the use of metadata.

Table B 2.2  Comparison of the functionality of indexes and metadata

<table>
<thead>
<tr>
<th>Applicability</th>
<th>Index</th>
<th>Metadata</th>
</tr>
</thead>
<tbody>
<tr>
<td>Applies to text resources</td>
<td>yes</td>
<td>yes</td>
</tr>
<tr>
<td>Applies to non-text resources, such as software or digital video</td>
<td>no</td>
<td>yes</td>
</tr>
<tr>
<td>Describes intellectual property ownership of the resources</td>
<td>no</td>
<td>yes</td>
</tr>
<tr>
<td>Describes conditions of use of the resources</td>
<td>no</td>
<td>yes</td>
</tr>
<tr>
<td>Supports machine understanding of the resource</td>
<td>no</td>
<td>yes</td>
</tr>
</tbody>
</table>

For metadata to be widely applicable, it needs to conform to standards of semantics and syntax, which allow, where possible, the use of natural language, and are flexible enough to cover a wide range of circumstances. Two major international initiatives are Dublin Core and the emerging Instructional Management Systems (IMS) standard. The EdNA metadata standard is an Australian initiative in the educational domain and is based upon Dublin Core. EdNA and IMS are currently collaborating in an effort toward harmonising the two standards.

B3.1  Dublin Core

The Dublin Core metadata standard <http://purl.oclc.org/dc/> is an internationally recognised standard, which has largely been developed by experts from the library and information technology communities. It consists of a set of 15 elements, separated into categories of content, intellectual property and instantiation, as shown in table A2.3. The semantic meanings of these 15 elements are well defined and some of elements accept values only from a ‘controlled vocabulary’. Under the Dublin Core standard, a metadata element’s meaning is unaffected by whether or not the element is embedded in the resource that it describes.
Table B 2.3  Dublin Core metadata elements

<table>
<thead>
<tr>
<th>Content</th>
<th>Intellectual property</th>
<th>Instantiation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Title</td>
<td>Creator</td>
<td>Date</td>
</tr>
<tr>
<td>Subject</td>
<td>Publisher</td>
<td>Type</td>
</tr>
<tr>
<td>Description</td>
<td>Contributor</td>
<td>Format</td>
</tr>
<tr>
<td>Source</td>
<td>Rights</td>
<td>Identifier</td>
</tr>
<tr>
<td>Language</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Relation</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Coverage</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

B3.2  IMS Standard

The Instructional Management Systems (IMS) [<http://www.imsproject.org/>] standard is also impacting the online education scene. This US-based initiative is in its third year of development. In the last twelve months its metadata foundation has become more closely aligned with the Dublin Core standard, although technically speaking it goes much further, in terms of the ‘granularity’ of metadata, in terms of interoperability, and in terms of complexity. IMS metadata is currently considerably more complex in conception than Dublin Core, and involves three ‘schemas’: categories (9), data elements (57), abstract data types (17). The IMS initiative claims that it is focused on the flexible management of online courseware, though some would argue that it is not well-matched to Australian pedagogical needs.

The overall stated goal of the IMS project is to ‘enable an open architecture for learning’. IMS stakeholders are identified as learners, teachers, coordinators and providers. Key design considerations for online learning are identified as:

- granular content;
- scalability;
- interoperability;
- customisability and extensibility; and
- facilitation of and support for collaboration.

Importantly, the IMS specification involves not just metadata standards but standards that also relate to user profiling and other technical issues involved in the delivery of online education. However, while it is a significant international initiative with support from EDUCAUSE (an amalgamation of the US-based organisations EDUCOM and CAUSE in 1998), it is still very much in the prototype stage. Its importance is recognised by DETYA, and an Australian IMS Centre has been established at the University of New England to
spearhead Australian involvement in the development of IMS standards, coordinate IMS activities being conducted around Australia, disseminate information about IMS developments to the Australian educational community, and promote the use of IMS standards in Australia.

**B3.3 EdNA Metadata standard**

Overarching strategies, such as the Dublin Core and IMS standards, cannot be all things to all communities and alone cannot cover all the data needs of Search Sites. Thus, other metadata standards, such as EdNA [http://www.edna.edu.au/EdNA/genericpage.html?file=/edna/aboutedna/metadata/index.html&sp=ecc099e000e0] or MetaChem [http://metachem.ch.adfa.edu.au/] exist to define further, finer-grained elements which are relevant to the communities they support. As identified by case study participants, a teaching and learning resource database will need to provide information about a range of issues, including teaching context, referee’s reports and evaluation data.

The EdNA metadata standard was publicly released in August 1998. In achieving agreement upon a standard suitable to all sectors, the EdNA metadata specification was based upon a minimalist approach. At that time, some debate prevailed as to what constituted standard use of ‘qualified’ Dublin Core. Also, there was considerable interest in deploying Dublin Core throughout other communities within Australia, such as government, libraries and museums. A wide acceptance of the Australian Government Locator Service (AGLS) standard [http://www.naa.gov.au/govserv/agsl/] took place quite quickly and EdNA supported this whole-of-government approach. However, in releasing its first metadata standard, EdNA also flagged that further discussion focused on defining pedagogical information in later versions would have to take place.

In summary, the metadata specifications are Type 3 data which, when applied appropriately on Type 2 data, can enhance the machine understanding of Type 1 data. The primary asset of Search Sites is their collection of Type 2 data. However, while Type 3 data is useful in its own right by enhancing the service of Search Sites, standardisation is required to enable the efficient creation of Type 2 data, so that Search Sites can access the widest range of resources.
B.4 Making use of metadata

Whichever metadata standard is used, it is necessary to associate the metadata (Type 2 data) with the Type 1 data to which it applies. This is achieved by either:

- embedding the metadata within the Type 1 data through the use of the `<META>` tag in HTML 3.2 and HTML 4.0 documents (only appropriate for text-based resources); or
- storing the metadata in a separate, detached resource linked to the Type 1 data (suitable for all types of resources).

The creation of metadata deserves special attention. Indexes can be created relatively simply by software robots, but are only appropriate for text-based resources. For other media, such as software modules and computer-aided learning packages, metadata is the only Type 2 data a Search Site can use.

As shown in table A3.2, metadata is currently the only mechanism by which a database of CFL resources can contain the richness desired by participants in this study.

Unfortunately, metadata cannot easily be automatically created. It needs the knowledge and judgement of human beings, and metadata generation will be very labour-intensive. On the one hand, the original resource owner knows the resource best, and so may be seen as the most qualified to create the metadata associated with the resource. On the other hand, case study participants strongly made the point that they did not value information supplied by the developer, preferring instead an unbiased, third-party view. Special purpose metadata-editing software will need to be developed to isolate the academic subject expert from the semantics and syntax of the metadata. There are strong implications for staff development if widespread use of metadata elements is to occur.

The process of creation of metadata can be simplified by the use of metadata creation and maintenance tools, such as those available from the Distributed Systems Technology Centre (DSTC) [<http://www.dstc.edu.au/>], a Cooperative Research Centre located primarily within the University of Queensland. Improved metadata tools are also being developed by EdNA, in collaboration with the higher education sector, in projects on: the improvement of the current metadata tool sets; and the production of a new tool to create metadata using retro-fit techniques for HTML documents.

Prior to the wide provision of metadata by Resource Sites, the primary asset of Search Sites was indexes (a form of Type 2 data) gathered by software robots. The quality of the result returned to end users depended largely on the characteristics of the Type 2 data owned by the Search Sites. That is, how
the Type 2 data had been created and how it had been presented to users, for example by the use of rating scales.

As metadata becomes more widely used, the role and assets of Search Sites will change significantly, because the Search Site may no longer own its Type 2 data. If the metadata is stored at the Search Site (detached from the Type 1 resource, but linked to it), then the Search Site owns the data, as before. However, if the individual metadata is embedded within the Type 1 resource, then it is owned by the Resource Site.

If a Search Site does not own the metadata, then it has no rights to modify it to add value to it. The asset of the Search Site will become the collection of the Type 2 data which it has created, coupled with the rating service it uses to help users to find appropriate resources. The collection of Type 2 data created by the Search Site is likely to qualify as a ‘Compilation’ under copyright law (see paragraphs 2.8 and 4.1.6 of Appendix A). However, the expanding use of metadata stored separately from the original resource will require careful analysis of the legal situation. The enacting of moral rights legislation will also have an impact on the content of the metadata created by Search Sites (section 5 of Appendix A).
Appendix C: Glossary

**AARNet links.** AARNet stands for the Australian Academic Research Network. The original Australian academic tertiary institution internet (note lower case ‘i’) which interconnected the networks of the principal Australian tertiary institutions. AARNet ceased to exist as an independent entity when it was sold to Telstra in 1995 to become the backbone of the Australian segment of the Internet (capital ‘I’).

**asynchronous threaded discussions.** Communication characterised by time-independence. This means that the sender and receiver do not communicate at the same time. Messages are organised into threads so that all replies on the same topic can be seen together.

**audiographic techniques.** A form of teleconferencing in real time using both an audio and a data connection. The computer screen is shared by more than one site, and used as an electronic blackboard, overhead projector or still video projector. Some systems allow for sharing software also.

**desktop videoconferencing.** Conducting a conference between two or more participants at different sites by using computer networks to transmit audio and video data. For example, a point-to-point (two-person) videoconferencing system works much like a video telephone. Each participant has a video camera, microphone, and speakers mounted on her or his computer. As the two participants speak to one another, their voices are carried over the network and delivered to the other’s speakers; whatever images appear in front of the video camera appear in a window on the other participant’s monitor.

**Dublin Core metadata standard.** The Dublin Core is a metadata element set intended to facilitate discovery of electronic resources. Originally conceived for author-generated description of web resources, it has attracted the attention of formal resource description communities such as museums, libraries, government agencies, and commercial organizations.

**EDUCAUSE.** EDUCAUSE is an international, nonprofit association whose mission is to help shape and enable transformational change in higher education through the introduction, use, and management of information resources and technologies in teaching, learning, scholarship, research, and institutional management. Current membership includes more than 1,600 colleges, universities, and education organizations and more than 150 corporations <http://www.educause.edu/>.
**FTP.** File Transfer Protocol. A communication protocol which permits transferring files or programs between two computers. FTP is used for transferring large files which cannot be handled as email attachments. Examples of FTP applications are Fetch (used on Macintosh computers) and WS_FTP (used on PC computers).

**HTML.** HyperText Markup Language. HTML is the computer language in which World Wide Web (often referred to as the Web or web) pages are written. HTML features the ability to attach hypertext ‘links’ to particular text or graphics within the web pages, so that when they are clicked on, the user is automatically presented with another web page or graphic dealing with the selected topic.

**IMS metadata standard.** Instructional Management System. IMS is a global coalition of academic, commercial and government organisations, working together to define the Internet architecture for learning. IMS is an initiative of EDUCAUSE (see EDUCAUSE). IMS metadata is currently more complex in conception than Dublin Core (see Dublin core metadata standard) and is focussed on the flexible management of online courseware.

**Internet.** There are two usages of the term ‘internet’. The first is that an internet is the result of linking together several independent and geographically remote computer networks to form one single very large network. This is a lower case ‘i’ internet. For example, the networks of a number of university campuses may be linked together to form a single university internet. When the same linkage occurs between faculties on the one campus, it is called an intranet. The capital ‘I’ Internet is the master internet which now encircles the globe and links together most of the lower case ‘i’ internets. The Internet carries services like the World Wide Web, email, FTP, IRC (Internet Relay Chat—see IRC) and more.

**IRC.** Internet Relay Chat. A live chat area of the Internet in which real-time conversations among two or more people take place via IRC software, ASCII commands, and channels. Each channel begins with a # and is dedicated to a different area of interest. IRC is considered another part of the technology of the Internet the same way FTP, Telnet, Gopher, and the Web are.

**ISDN links.** Abbreviation of Integrated Services Digital Network, an international communications standard for sending voice, video, and data over digital telephone lines. ISDN requires special metal wires and supports data transfer rates of 64 kbps (64,000 bits per second). Most ISDN lines offered by telephone companies give you two lines at once, called B channels. You can use one line for voice and the other for data, or you can use both lines for data to give you data rates of 128 kbps, three times the data rate provided by today’s fastest modems. The original version of ISDN employs baseband transmission. Another version, called B-ISDN, uses broadband transmission.
and is able to support transmission rates of 1.5 Mbps. B-ISDN requires fibre optic cables and is not widely available.

ISP. Internet Service Provider. ISPs are companies which sell access to the Internet to the general public. Once you have signed on with an ISP, you can connect to their computers to yours via a modem. Once connected, you can then use software on your computer to navigate the World Wide Web, send e-mail, download software, etc. Usually, ISPs operate their own web and FTP services, so that their customers can (for a fee) have their own personal web pages and FTP sites.

metadata. Data about data. Metadata describes how and when and by whom a particular set of data was collected, and how the data is formatted. Metadata is essential for understanding information stored in data warehouses.

microwave links. The term microwave refers to electromagnetic energy having a frequency higher than 1 GHz (billions of cycles per second), corresponding to wavelengths shorter than 30 centimetres. Microwave signals propagate in straight lines and are affected very little by the troposphere. They are not refracted or reflected by ionised regions in the upper atmosphere. Microwave beams do not readily diffract around barriers such as hills, mountains, and large human-made structures. Some attenuation occurs when microwave energy passes through trees and frame houses. Radio-frequency (RF) energy at longer wavelengths is affected to a lesser degree by such obstacles.

modem dial-up access. Modem stands for MOdulator-DEModulator and is used to convert digital computer signals to analogue telephone signals and vice versa. A modem is the device that connects your computer into the telephone lines, so that you can transfer files back and forth between your computer and some remote computer or network which is also fitted with a modem. One dials a telephone line to access the system; hence the term ‘dial-up access’.

online distributed learning systems. A set of software tools which allows online courses to be established. Students who log into an online distributed learning system can access information on local pages, look at links to other external pages, and engage in activities likes quizzes and threaded discussions. These discussions can be facilitated by a content expert. The results from assessment tasks can be stored and transferred to a student management system (see below).

resource site. A web site that contains content that people can engage with.

search site. A web site that allows users to enter keywords and queries and retrieve information stored in resource sites.
smart card. A small electronic device about the size of a credit card that contains electronic memory, and possibly an embedded integrated circuit (IC). Smart cards containing an IC are sometimes called Integrated Circuit Cards (ICCs). Smart cards are used for a variety of purposes, including:

- storing a person's medical or educational records;
- storing digital cash; and
- generating network identification (similar to a token).

To use a smart card, either to pull information from it or add data to it, you need a smart card reader, a small device into which you insert the smart card.

streaming audio. Streaming audio is audio that is played as it arrives. The alternative is a sound recording (such as a WAV file) that doesn't start playing until the entire file has arrived. Support for streaming audio may require a plug-in player or come with the browser. Leading providers of streaming audio include Progressive Networks' RealAudio and Macromedia's Shockwave for Director (which includes an animation player as well).

streaming video. Streaming video is a sequence of 'moving images' that are sent in compressed form over the Internet and displayed by the viewer as they arrive. Streaming media is streaming video with sound. With streaming video or streaming media, a web user does not have to wait to download a large file before seeing the video or hearing the sound. Instead, the media is sent in a continuous stream and is played as it arrives. The user needs a player, which is a special program that uncompresses and sends video data to the display and audio data to speakers. A player can be either an integral part of a browser or downloaded from the software maker's Web site.

student management system. One advantage of online courses is that students' enrolment records and their assessment results can be stored efficiently in a database system. Students can enrol, change details and access their results online. Both the university administration and the student can 'manage' learning details more efficiently.

studio videoconferencing. A videoconference is a group or a person-to-person discussion in which participants are at different locations but can see and hear each other as though they were together in one place. Most off-the-Internet videoconferences today involve the use of a room at each geographic location with special video camera and document presentation facilities. In some newer approaches, the appearance that all participants are in the same room around a table is simulated. In general, traditional videoconferencing requires special telephone interconnections with wide bandwidth.

synchronous chat. Communication occurring between parties that are temporally synchronised. This means communication that occurs between
people at the same time, although not necessarily in the same place. Users interact and have real time online conversations.

**teleconferencing.** To hold a conference via a telephone or network connection. Computers have given new meaning to the term because they allow groups to do much more than just talk. Once a teleconference is established, the group can share applications and mark up a common whiteboard. There are many teleconferencing applications that work over private networks. One of the first to operate over the Internet was Microsoft’s NetMeeting.

**telnet.** A terminal emulation program for TCP/IP networks such as the Internet. The telnet program runs on your computer and connects a desktop computer to a server on the network. The user can then enter commands through the telnet program and they will be executed as if they were being entered directly on the server console. This enables the user to control the server and communicate with other servers on the network. To start a telnet session, the user must log in to a server by entering a valid username and password. Telnet is a common way to remotely control web servers.

**Type 1 data.** Are resources in which users are interested. CFL resources are Type 1 data stored on Resource Sites.

**Type 2 data.** Are derived directly from Type 1 data. They are locations and descriptions of Type 1 resources returned by search sites. There are two main subtypes of Type 2 data: indexes and metadata.

**Type 3 data.** Type 3 data cannot be derived from a single piece of Type 1 or Type 2 data. Instead, it is meta-meta information, like the Dewey Decimal classification scheme in libraries. Type 3 data includes the data that describes hyperlinks between documents; various metadata standards, such as the Dublin core and IMS standards; the usage logs in proxy servers about web pages; and the popularity rating of a web page among similar pages. Type 3 data are typically associated with a group of resources, identifying the relationships between resources.
Appendix D: Surveys

D.1 Survey of Australian universities

1. CENTRAL ADMINISTRATION

In this section, we are interested in learning about how your University is developing policy to support computer-facilitated learning, especially online learning. We are interested in how priorities are being set and what investments the University is making.

1.0 Please select your University

1.1 What investment has your University made in providing for online learning? Please check the appropriate buttons and comment if possible:

1.1.1 Obtaining software site licences for online distributed learning systems (e.g. WebCT, TopClass). Please provide details.

- Yes
- No
- Unknown

1.1.2 Building or planning to build your own online distributed learning system (this might include commercial components)

- Yes
- No
- Unknown

1.1.3 New network systems. Please describe current and future plans.

- Yes
- No
- Unknown

1.1.4 New student computer labs. Please provide numbers.

- Yes
- No
- Unknown

1.1.5 Arranging leases for student computers. Please describe arrangements.
1.1.6 Providing access to a local university network for students
- Yes
- No
- Unknown

1.1.7 Providing Internet access for students
- Yes
- No
- Unknown

1.1.8 Brokering Internet access for students with private providers
- Yes
- No
- Unknown

1.1.9 Providing financial support to faculties for the development of online courseware. Please provide details.
- Yes
- No
- Unknown

1.1.10 Other
- Yes
- No
- Unknown

1.2 Does your University have an Intellectual Property (IP) policy for computer-facilitated learning (CFL) materials produced by staff at your University?
- Yes
- No
Developing a framework for a useable and useful inventory of computer-facilitated learning and support materials in Australian universities

1.3 If Yes to Q1.2, does the IP policy encourage collaboration with other institutions?

☐ Yes

If Yes to collaboration, could you please provide an example where the policy has encouraged collaboration?

☐ No

☐ Unknown

1.4 Does your University support commercialisation of CFL products, through the IP policy or otherwise?

☐ Yes

If Yes to commercialisation, can you provide a list of commercially available materials produced by your University?

☐ No

☐ Unknown

1.5 Does your University have a policy or guidelines on quality assurance of existing CFL materials being used at the University?

☐ Yes

If Yes, is the quality assurance process at Faculty or University level?

☐ No

☐ Unknown

1.6 How does your University provide support for the development/production of computer-facilitated learning (CFL) materials? Is this support

(select one)

☐ centralised?

☐ devolved?

☐ both?

1.7 What measures is your University taking to ensure technological literacy of its staff? This includes the skills, conceptual understandings and dispositions which enable staff to use technology effectively for academic, research and vocational purposes. Click on the appropriate buttons and comment if appropriate:

1.7.1 Optional modules for staff
Developing a framework for a useable and useful inventory of computer-facilitated learning and support materials in Australian universities

☐ Yes
☐ No
☐ Unknown

1.7.2 Formal professional development for staff leading to qualifications

☐ Yes
☐ No
☐ Unknown

1.7.3 Other

☐ Yes
☐ No
☐ Unknown

1.7.4 Please provide information about resources developed for IT literacy for staff or commercial materials which are used.

☐ Yes
☐ No
☐ Unknown

1.8 What measures is the University taking to ensure technological literacy of its students? This includes the skills, conceptual understandings and dispositions which enable students to use technology effectively for academic, research and vocational purposes. Click on the appropriate buttons and comment if appropriate:

1.8.1 Optional no-credit modules for students

☐ Yes
☐ No
☐ Unknown

1.8.2 Optional credit modules for students

☐ Yes
☐ No
☐ Unknown

1.8.3 IT literacy built into existing courses for students
Developing a framework for a useable and useful inventory of computer-facilitated learning and support materials in Australian universities

1.8.4 Courses run by the Library for students

1.8.5 Other

1.8.6 Please provide information about resources developed for IT literacy for students or commercial materials which are used.

1.9 How is the University using or planning to use online technologies to support:

1.9.1 Students with disabilities?

1.9.2 Equity and access policies?

1.10 Is your University a multi-campus institution?

If Yes, please describe the infrastructure links (e.g. microwave links, AARNET) between campuses that allow CFL materials to be delivered to more than one campus. If possible, please provide examples of teaching using computer technology across more than one campus.
1.11 Does your University have a specific infrastructure link to TAFE?

- [ ] Yes
- [ ] No
- [ ] Unknown

If Yes, please describe the way in which CFL resources are shared in this relationship.

1.12 Does your University focus on preparing online courses for students who are mainly:

- [ ] on-campus?
- [ ] off-campus?
- [ ] both?

Why were these courses selected to be prepared in online mode?

1.13 Please select which of the following features of online teaching and learning are commonly used at the University:

1.13.1

- [ ] Course information
- [ ] Provision of content information
- [ ] Interactive learning experiences
- [ ] Informal quizzes
- [ ] Formal assessment tasks
- [ ] Use of threaded discussions
- [ ] Use of synchronous chat
- [ ] Links to Australian Web sites
- [ ] Links to international Web sites

1.13.2 Please provide some examples of online courses at your University. If possible, we would like examples from a range of disciplines - both humanities and sciences. Please provide us with a contact person for each online course who we could contact for further information, and URLs we could look at. This question has also been added to section 4, Academic Development Unit.
1.14 Please provide examples of other innovative uses of computer technology, e.g. the development of stand-alone interactive multimedia materials that are occurring at your University. If possible, we would like examples from a range of disciplines - both humanities and sciences. Please provide us with a contact person for each innovation who we could contact for further information. This question has also been added to section 4, Academic Development Unit.

1.15 Please provide any other information about any other current approaches you use that you believe assists the take-up of CFL in your University.

1.16 Please provide the name, telephone and email address of a Central Administration staff member who can be contacted if we wish to follow up any of the responses in this survey.

Name
Telephone
Email

If you have printed materials about your University that you feel would be useful to this project or for other institutions to access, please post to:

Associate Professor Carmel McNaught
Learning Technologies Unit
RMIT University, GPO Box 2476V
Melbourne 3001

Please email electronic resources, e.g. URLs to carmel.mcnaught@rmit.edu.au

Thank you very much for your time and cooperation.

End of this survey. [submit]
2. INFORMATION TECHNOLOGY SERVICES

In this section, we are interested in learning about how your University is developing its infrastructure system to support teaching and learning. We would like to know which technologies are being used and supported.

2.0 Please select your University

2.1 Does your university provide the infrastructure and software to support the following. Please answer (check the box) for both staff and students.

<table>
<thead>
<tr>
<th>Technology</th>
<th>Staff</th>
<th>Students</th>
</tr>
</thead>
<tbody>
<tr>
<td>Email</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>World Wide Web</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Telnet</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Ftp (file transfer protocol)</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Synchronous chat</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Desktop videoconferencing</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Studio videoconferencing</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Streaming audio</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Streaming video</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Dial-up access</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>General office applications - e.g., MS Word, Excel</td>
<td>☐</td>
<td>☐</td>
</tr>
</tbody>
</table>

2.2.1 How widely are the technologies used by staff (check the button)?

<table>
<thead>
<tr>
<th>Technology</th>
<th>Used by a majority of staff</th>
<th>Used by a minority or no staff</th>
</tr>
</thead>
<tbody>
<tr>
<td>Email</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>World Wide Web</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Telnet</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Ftp (file transfer protocol)</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Synchronous chat</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Desktop videoconferencing</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Studio videoconferencing</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Streaming audio</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Streaming video</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Dial-up access</td>
<td>☐</td>
<td>☐</td>
</tr>
</tbody>
</table>
2.2.2 Please provide data on usage rates if available for those being used by a majority of staff?

2.2.3 Please describe projected plans for increasing staff access to these technologies?

2.3.1 How widely are the technologies used by students (check the button)?

<table>
<thead>
<tr>
<th>Technology</th>
<th>Used by a majority of students</th>
<th>Used by a minority or no students</th>
</tr>
</thead>
<tbody>
<tr>
<td>Email</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>World Wide Web</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>Telnet</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>Ftp (file transfer protocol)</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>Synchronous chat</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>Desktop videoconferencing</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>Studio videoconferencing</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>Streaming audio</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>Streaming video</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>Dial-up access</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>General office applications - e.g., MS Word, Excel</td>
<td>○</td>
<td>○</td>
</tr>
</tbody>
</table>

2.3.2 Please provide any data on usage rates for those being used by a majority of students?

2.3.3 Please describe projected plans for increasing student access to these technologies?

2.4.1 What priority is given through resource allocation to the following issues?
2.4.2 Please provide examples where the rating is 3 or above.

________________________________________________________________________

2.5 Please fill in the table below as an indication of the University’s capacity to deliver on-campus online courses.

<table>
<thead>
<tr>
<th>University unit</th>
<th>Approximate no. of work stations capable of accessing the University’s network</th>
<th>No. of support staff to service student needs</th>
</tr>
</thead>
<tbody>
<tr>
<td>ITS labs</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Library labs</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Faculty-owned computer labs</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Department-owned computer labs</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other student labs</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

2.6 Are any of your support/training functions outsourced? Please elaborate.

C Yes
C No.
C Unknown

2.7 How does your University support dial-up access for staff and students? In particular, comment on the extent of the modem pool, and on whether the University negotiates ISP agreements for students. Please comment on plans as well as existing provision.

________________________________________________________________________
2.8 Does your University have any arrangement for leasing computers to students? If Yes, please give details of the scheme?

☐ Yes
☐ No
☐ Unknown

2.9 Does your University have a Web-based student enrolment system? Please elaborate.

☐ Yes
☐ No
☐ Unknown

2.10 Can students obtain their official assessment results via the Web?

☐ Yes
☐ No
☐ Unknown

2.11 How is your University handling security issues about the use of computers for assessment and student records?


2.12 Is your University planning to implement a smart card system for students?

☐ Yes
☐ No
☐ Unknown

2.13 Please provide any other information about any other current approaches you use that you believe assists the adoption of computer-facilitated learning (CFL) in your University.
2.14 Please provide the name, telephone and email address of a ITS staff member who can be contacted if we wish to follow up any of the responses in this survey.

Name
Telephone
Email

If you have printed materials, such as the University IT Strategic Plan, that you feel would be useful to this project or for other institutions to access, please post to:

Associate Professor Carmel McNaught
Learning Technologies Unit
RMIT University, GPO Box 2476V
Melbourne 3001

Please email electronic resources, e.g. URLs to carmel.mcnaught@rmit.edu.au

Thank you very much for your time and cooperation.

End of this survey. [submit]
3. UNIVERSITY LIBRARY

In this section, we are interested in learning about how the Library operates to assist staff to find computer-facilitated learning resources for use in the courses they teach.

3.0 Please select your University

3.1.1 Does the Library provide an online catalogue of University holdings?

☐ Yes
☐ No
☐ Unknown

3.1.2 If Yes, is the online catalogue:

☐ totally Web-based?
☐ partially Web-based, partially telnet-based?
☐ not Web-based at all? (select one)

3.2 How does the Library support the development of general information literacy skills for staff? Please tick whichever categories of support apply.

<table>
<thead>
<tr>
<th>Choose one or more</th>
</tr>
</thead>
<tbody>
<tr>
<td>Formal induction sessions</td>
</tr>
<tr>
<td>Information (in document)</td>
</tr>
<tr>
<td>Information (online)</td>
</tr>
<tr>
<td>Support staff available</td>
</tr>
<tr>
<td>Other</td>
</tr>
</tbody>
</table>

3.3 How does the Library support the development of general information literacy skills for students? Please check whichever categories of support apply.

<table>
<thead>
<tr>
<th>Choose one or more</th>
</tr>
</thead>
<tbody>
<tr>
<td>Formal induction sessions</td>
</tr>
<tr>
<td>Information (in document)</td>
</tr>
<tr>
<td>Information (online)</td>
</tr>
<tr>
<td>Support staff available</td>
</tr>
</tbody>
</table>
Developing a framework for a usable and useful inventory of computer-facilitated learning and support materials in Australian universities

3.4 Does the Library provide support for online searching for information about computer-facilitated learning (CFL) materials by staff for use in teaching (rather than research or grant applications)?

☐ Yes If Yes, go to question 3.5
☐ No If No, go to question 3.6
☐ Unknown

3.5 If Yes to 3.4, what support is provided? Please check whichever categories of support apply.

<table>
<thead>
<tr>
<th>Category</th>
<th>Choose one or more</th>
</tr>
</thead>
<tbody>
<tr>
<td>Information (in document)</td>
<td>☐</td>
</tr>
<tr>
<td>Information (online)</td>
<td>☐</td>
</tr>
<tr>
<td>Demonstration</td>
<td>☐</td>
</tr>
<tr>
<td>Search service providing the results</td>
<td>☐</td>
</tr>
</tbody>
</table>

3.6 If No to 3.4, is the support provided elsewhere in the University? If so, where?

☐ Yes
☐ No
☐ Unknown

3.7.1 Does the Library maintain a catalogue of CFL resource materials, in either electronic or paper-based form?

☐ Yes A yes response is linked to questions 3.7.2, 3.8, and 3.9
☐ No
☐ Unknown

3.7.2 If Yes to 3.7.1, please indicate the number of items in the catalogue

- Catalogue                     Number of items
  Electronic catalogue
  Hard copy catalogue

3.8 If Yes to 3.7.1, how is this information made available? Please check whichever categories apply.
Developing a framework for a useable and useful inventory of computer-facilitated learning and support materials in Australian universities

<table>
<thead>
<tr>
<th>Choose one or more</th>
</tr>
</thead>
<tbody>
<tr>
<td>From workstations within the Library</td>
</tr>
<tr>
<td>From intranet (internal)</td>
</tr>
<tr>
<td>From internet (national/international)</td>
</tr>
<tr>
<td>Other</td>
</tr>
</tbody>
</table>

3.9 If Yes to 3.7.1, how is this information publicised?

3.10 Does the Library particularly recommend any Web-based catalogues for CFL materials to staff, such as the Uniserve clearinghouses?

- [ ] Yes
  - If Yes, which Web sites have you found particularly helpful?
- [ ] No
- [ ] Unknown

3.11 What financial resources does the Library provide for the acquisition of CFL materials? Please describe the situation in 1998.

3.12 Are Library staff involved in the production of CFL materials in collaborative projects with academic staff at the University?

- [ ] Yes
  - If Yes, please provide examples.
- [ ] No
- [ ] Unknown

3.13 Does the Library combine with other libraries/organisations/groups to acquire CFL materials?
Developing a framework for a usable and useful inventory of computer-facilitated learning and support materials in Australian universities

3.14 Does the Library actively seek to share your CFL resources with other libraries?

- Yes
- No
- Unknown

If Yes, please describe how.

3.15 Please provide any other information about any other current approaches you use that you believe assists the adoption of CFL in your University.

3.16 Please provide the name, telephone and email address of a Library staff member who can be contacted if we wish to follow up any of the responses in this survey.

Name
Telephone
Email

If you have printed materials about the Library's work that you feel would be useful to this project or for other institutions to access, please post to:

Associate Professor Carmel McNaught
Learning Technologies Unit
RMIT University, GPO Box 2476V
Melbourne 3001

Please email electronic resources, e.g. URLs to carmel.mcnought@rmit.edu.au

Thank you very much for your time and cooperation.

End of this survey. Submit
4. ACADEMIC DEVELOPMENT UNIT

In this section, we are interested in learning about how the Academic Development Unit supports university staff in activities relating to the use of technology in teaching and learning.

4.0 Please select your University

4.1 Does your unit have an existing or draft Teaching and Learning Plan?

☐ Yes If Yes, go to questions 4.2.1 to 4.2.4.

☐ No If No, go to question 4.3.

☐ Unknown

4.2 If you answered Yes to question 4.1:

4.2.1 Is it aligned with a University Strategic Plan?

☐ Yes

☐ No

4.2.2 Is it aligned with an IT Plan?

☐ Yes

☐ No

4.2.3 Is there a section in the Teaching and Learning Plan related to flexible learning?

☐ Yes

☐ No

4.2.4 Is there any mention of flexible learning related to technology?

☐ Yes

☐ No

4.3 How many staff are in the unit?


4.4 How many staff work primarily supporting technology in teaching and learning?


4.5 Do you have a budget from internal university funds for supporting technology in teaching and learning?

☐ Yes If Yes, how much was it in 1998? How was it used?

☐ No

☐ Unknown
### 4.6 What activities occur in your unit relating to technology in teaching and learning? Please check the following:

<table>
<thead>
<tr>
<th>Activity</th>
<th>Major activity</th>
<th>Minor activity</th>
<th>No activity</th>
</tr>
</thead>
<tbody>
<tr>
<td>General university-wide workshops</td>
<td>c</td>
<td>c</td>
<td>c</td>
</tr>
<tr>
<td>Faculty/department workshops</td>
<td>c</td>
<td>c</td>
<td>c</td>
</tr>
<tr>
<td>Software training sessions</td>
<td>c</td>
<td>c</td>
<td>c</td>
</tr>
<tr>
<td>IT literacy support for staff</td>
<td>c</td>
<td>c</td>
<td>c</td>
</tr>
<tr>
<td>IT literacy support for students</td>
<td>c</td>
<td>c</td>
<td>c</td>
</tr>
<tr>
<td>Information literacy support for staff</td>
<td>c</td>
<td>c</td>
<td>c</td>
</tr>
<tr>
<td>Information literacy support for students</td>
<td>c</td>
<td>c</td>
<td>c</td>
</tr>
<tr>
<td>Educational design of entire courses</td>
<td>c</td>
<td>c</td>
<td>c</td>
</tr>
<tr>
<td>Educational design of units</td>
<td>c</td>
<td>c</td>
<td>c</td>
</tr>
<tr>
<td>Individual consultations</td>
<td>c</td>
<td>c</td>
<td>c</td>
</tr>
<tr>
<td>Evaluation of computer-facilitated learning (CFL) innovations</td>
<td>c</td>
<td>c</td>
<td>c</td>
</tr>
<tr>
<td>Providing information about CFL resources</td>
<td>c</td>
<td>c</td>
<td>c</td>
</tr>
<tr>
<td>Maintaining an inventory of CFL projects in the university</td>
<td>c</td>
<td>c</td>
<td>c</td>
</tr>
<tr>
<td>Support for computer-based assessment systems</td>
<td>c</td>
<td>c</td>
<td>c</td>
</tr>
<tr>
<td>Support for online learning systems</td>
<td>c</td>
<td>c</td>
<td>c</td>
</tr>
<tr>
<td>Facilitation of grant writing for CFL development</td>
<td>c</td>
<td>c</td>
<td>c</td>
</tr>
<tr>
<td>Visiting specialists, teachers, scholars</td>
<td>c</td>
<td>c</td>
<td>c</td>
</tr>
<tr>
<td>Other</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### 4.7

Please rate these activities in terms of how effective you believe each activity is in increasing the uptake of CFL in the university.

<table>
<thead>
<tr>
<th>Activity</th>
<th>Very important</th>
<th>5</th>
<th>4</th>
<th>3</th>
<th>2</th>
<th>1</th>
<th>Not important at all</th>
</tr>
</thead>
<tbody>
<tr>
<td>General university-wide workshops</td>
<td>c</td>
<td>c</td>
<td>c</td>
<td>c</td>
<td>c</td>
<td>c</td>
<td></td>
</tr>
<tr>
<td>Faculty/department workshops</td>
<td>c</td>
<td>c</td>
<td>c</td>
<td>c</td>
<td>c</td>
<td>c</td>
<td></td>
</tr>
<tr>
<td>Software training sessions</td>
<td>c</td>
<td>c</td>
<td>c</td>
<td>c</td>
<td>c</td>
<td>c</td>
<td></td>
</tr>
<tr>
<td>IT literacy support for staff</td>
<td>c</td>
<td>c</td>
<td>c</td>
<td>c</td>
<td>c</td>
<td>c</td>
<td></td>
</tr>
<tr>
<td>IT literacy support for students</td>
<td>c</td>
<td>c</td>
<td>c</td>
<td>c</td>
<td>c</td>
<td>c</td>
<td></td>
</tr>
</tbody>
</table>
### 4.8 Consider the following categories of staff in their use of technology in teaching and learning:

- Innovators
- Early adopters
- Users when technology is mainstream
- Very reluctant users

#### 4.8.1 List any faculties/ departments/ units who you believe are past early adopter stage.


#### 4.9 What factors do you consider important in achieving this situation?
<table>
<thead>
<tr>
<th>Very important</th>
<th>5</th>
<th>4</th>
<th>3</th>
<th>2</th>
<th>1</th>
<th>Not important at all</th>
</tr>
</thead>
<tbody>
<tr>
<td>Key individuals</td>
<td>c</td>
<td>c</td>
<td>c</td>
<td>c</td>
<td>c</td>
<td></td>
</tr>
<tr>
<td>University policy</td>
<td>c</td>
<td>c</td>
<td>c</td>
<td>c</td>
<td>c</td>
<td></td>
</tr>
<tr>
<td>Faculty policy</td>
<td>c</td>
<td>c</td>
<td>c</td>
<td>c</td>
<td>c</td>
<td></td>
</tr>
<tr>
<td>Rewards mechanisms</td>
<td>c</td>
<td>c</td>
<td>c</td>
<td>c</td>
<td>c</td>
<td></td>
</tr>
<tr>
<td>ADU support</td>
<td>c</td>
<td>c</td>
<td>c</td>
<td>c</td>
<td>c</td>
<td></td>
</tr>
<tr>
<td>Internal funding</td>
<td>c</td>
<td>c</td>
<td>c</td>
<td>c</td>
<td>c</td>
<td></td>
</tr>
<tr>
<td>External funding</td>
<td>c</td>
<td>c</td>
<td>c</td>
<td>c</td>
<td>c</td>
<td></td>
</tr>
</tbody>
</table>

Other

4.10 Are any staff in your unit involved in cross-institutional projects for the use of technology in teaching and learning? Please elaborate.

- Yes
- No
- Unknown

4.11 Please select which of the following features of online teaching and learning are commonly used at the University:

<table>
<thead>
<tr>
<th>Course information</th>
<th>Provision of content information</th>
<th>Interactive learning experiences</th>
<th>Informal quizzes</th>
<th>Formal assessment tasks</th>
<th>Use of threaded discussions</th>
<th>Use of synchronous chat</th>
<th>Links to Australian Web sites</th>
<th>Links to international Web sites</th>
</tr>
</thead>
</table>

4.11.2 Please provide some examples of online courses at your University. If possible, we would like examples from a range of disciplines - both humanities and sciences. Please provide us with a contact person for each online course who we could contact for further information, and URLs we could look at. This question has also been added to section 1, Central Administration.
4.12 Please provide examples of other innovative uses of computer technology, e.g. the development of stand-alone interactive multimedia that are occurring at your University. If possible, we would like examples from a range of disciplines - both humanities and sciences. Please provide us with a contact person for each innovation who we could contact for further information. This question has also been added to section 1, Central Administration.

4.13 Please provide any other information about any other current approaches you use that you believe assists the adoption of CFL in your University.

4.14 Please provide the name, telephone and email address of an Academic Development Unit staff member who can be contacted if we wish to follow up any of the responses in this survey.

Name

Telephone

Email

If you have printed materials that you feel would be useful to this project or for other institutions to access, please post to:

Associate Professor Carmel McNaught
Learning Technologies Unit
RMIT University, GPO Box 2476V
Melbourne 3001

Please email electronic resources, e.g. URLs to carmel.mcnaught@rmit.edu.au

Thank you very much for your time and cooperation.

End of this survey. _submit_

Survey tool by Digital Learning Systems Pty. Ltd.: Online data collection, collation and analysis
The Australasian Society for Computers in Learning in Tertiary Education (ASCILITE) has obtained a grant funded by DETYA through the Evaluations & Investigations Programme for the following project:

Development of a National Inventory of Computer-facilitated Learning and Support Materials used in University Teaching

Click here for a full description of the project.

In this survey of ASCILITE members we are seeking to find out what has assisted you in your adoption and use of CFL materials in your professional work.

Questionnaire to ASCILITE members

5.0 Please select your University

5.1 Consider the following categories of staff in their use of technology in teaching and learning:

- Innovators
- Early adopters
- Users when technology is mainstream
- Very reluctant users

<table>
<thead>
<tr>
<th>Innovators</th>
<th>4</th>
<th>3</th>
<th>2</th>
<th>1</th>
<th>Very reluctant users</th>
</tr>
</thead>
<tbody>
<tr>
<td>Where do you consider the majority of your university's staff is on this scale?</td>
<td></td>
<td></td>
<td></td>
<td>r</td>
<td>r</td>
</tr>
<tr>
<td>Where do you consider the majority of your faculty's staff is on this scale?</td>
<td></td>
<td></td>
<td></td>
<td>r</td>
<td>r</td>
</tr>
</tbody>
</table>
5.2 The following activities occur at many universities. Please rank these activities in terms of how effective you believe each activity has been for you in supporting your use of CFL materials.

<table>
<thead>
<tr>
<th>Very important</th>
<th>5</th>
<th>4</th>
<th>3</th>
<th>2</th>
<th>1</th>
<th>Not important at all</th>
</tr>
</thead>
<tbody>
<tr>
<td>General university-wide workshops</td>
<td>c</td>
<td>c</td>
<td>c</td>
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<tr>
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<td>c</td>
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<td>c</td>
<td>c</td>
<td>c</td>
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</tr>
<tr>
<td>IT literacy support for students</td>
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<td>c</td>
<td>c</td>
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<td>c</td>
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<td>Information literacy support for students</td>
<td>c</td>
<td>c</td>
<td>c</td>
<td>c</td>
<td>c</td>
<td>c</td>
</tr>
<tr>
<td>Educational design of entire courses</td>
<td>c</td>
<td>c</td>
<td>c</td>
<td>c</td>
<td>c</td>
<td>c</td>
</tr>
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<td>Educational design of units</td>
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<td>Individual consultations</td>
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<td>Evaluation of CFL innovations</td>
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<td>Providing information about CFL resources</td>
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<td>Maintaining an inventory of CFL projects in the university</td>
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<td>Facilitation of grant writing for CFL development</td>
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</table>

Other

Associate Professor Carmel McNaught
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Thank you very much for your time and cooperation.

End of this survey. submit

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