

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

Centralised funding	Devolved funding
<i>Points in favour of:</i>	
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.	Can fund projects based on local knowledge of curricula and faculty culture.
Can foster cross-faculty collaboration and communication.	Can develop stable ongoing teams for future developments.
Can allow university strategic priorities to be enacted.	Can allow local ownership and commitment to grow.
Can foster the integration of outside funding with university priorities.	Can source funding from discipline and industry-related bodies.
<i>Issues associated with:</i>	
If the funding committee is not broadly constituted, this can result in a restricted range of models being favoured.	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 university personalities; this may disadvantage certain faculties.	Can be dominated by a few strong faculty personalities; this may disadvantage certain departments/ schools.

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

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

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.

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)

Integrated Approach	
Strong structural links between units or section of the one unit which provide general T&L support, support for using IT in T&L, and production support for courseware. Essentially top-down.	
<i>Benefits:</i>	<i>Issues raised by:</i>
Coherent policy framework.	Ease of access by all staff limited.
Efficient planning of resources and avoidance of duplication.	Individual approaches less likely to be recognised.
	An emphasis on one technological solution may emerge and overwhelm educational design.
Parallel approach	
Separate units for general T&L support and support for using IT in T&L	
<i>Benefits:</i>	<i>Issues raised by:</i>
Allows due recognition to be given to a wide range of T&L issues (e.g internationalisation) and not just educational design associated with the use of IT.	Cooperation between the various units may be difficult to achieve. There is a potential for confusion and competition to emerge
Allows the development of expertise relating to the new technologies.	May result in a narrow range of educational issues being addressed in the IT in T&L units.
Distributed approach	
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.	
<i>Benefits:</i>	<i>Issues raised by:</i>
An 'organic' solution where unnecessary controls do not hamper innovation.	Can result in weak project management where there may be insufficient educational expertise.
Can be economical as skills are sought	Potential for innovations to falter with out visible institutional support.
	Can result in waste and duplication of effort and resources, including equipment.

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:

- **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 <<http://www.cfl.mq.edu.au/>> 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) <<http://online.mq.edu.au/>> 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 <<http://www.webct.com/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 <<http://www.lib.mq.edu.au/itsup/>> 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 be 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 to 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.

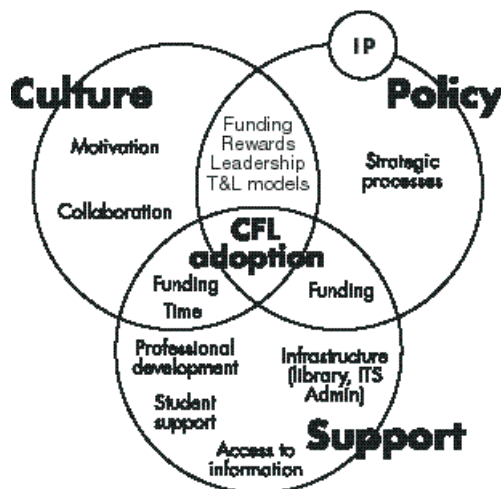
8.1 Adoption

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 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 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 gee-whiz 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.

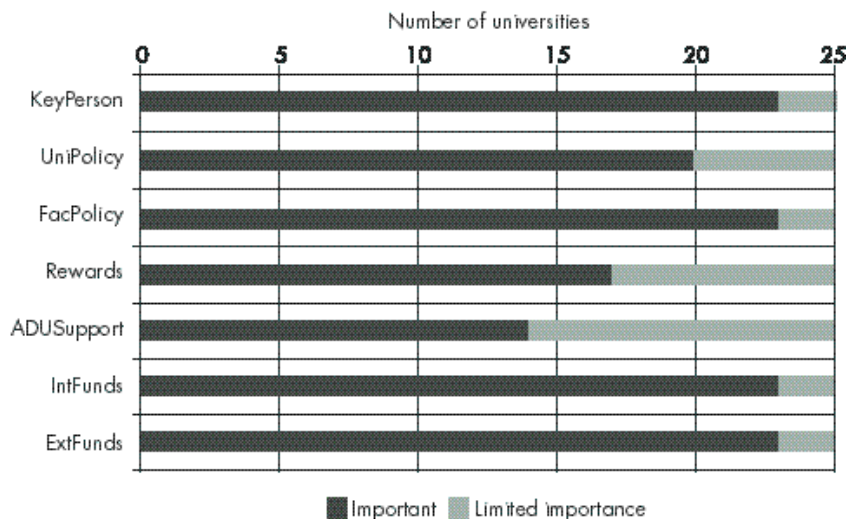
I'm also researching the implications of the fact that LearningSpace is now available in Mandarin and other languages, and will reasonably soon incorporate IBM's translation and voice technology. This will mean that students who don't have the same language can take the same course. It will also mean 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)



Key:

- KeyPerson: Key individuals
- UniPolicy: University policy
- FacPolicy: Faculty policy
- Rewards: Rewards mechanisms
- ADUSupport: ADU support
- IntFunds: Internal funding
- ExtFunds: External funding

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, Stratford 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>>. 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

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, its 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 a 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:

- 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

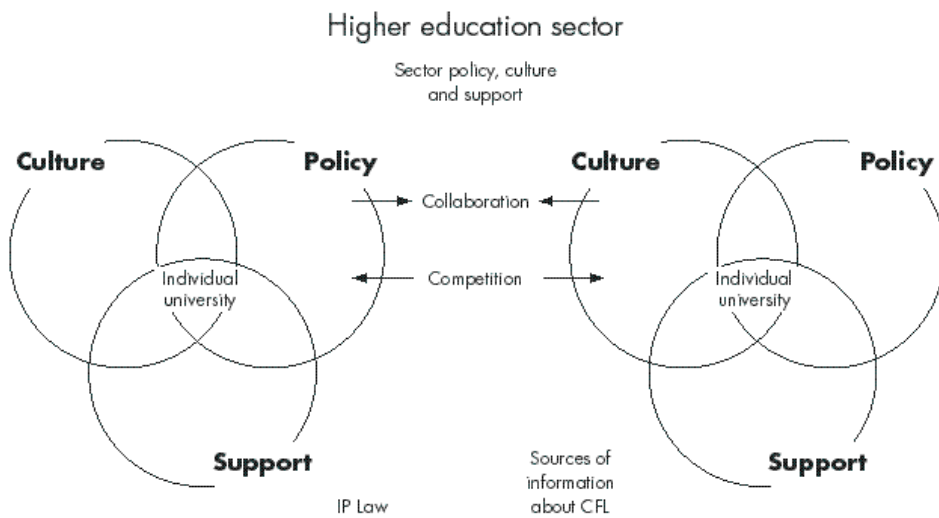
A factor which works against collaboration with external organisations is the emerging competitive environment. Colleagues are now seen as competitors and therefore there is a reluctance to share developments. Present government policies, one interviewee argued, have had a significant role in bringing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

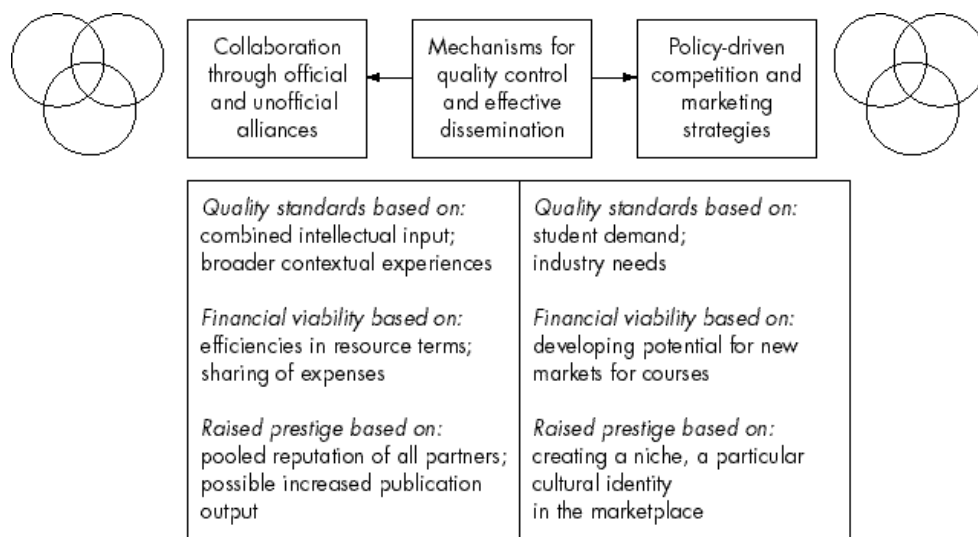
As we have noted above there is a tension between collaboration and competition. This is shown diagrammatically in figure 8.3 where collaboration show institutions being drawn together and competition pushing them apart.

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.

Figure 8.4: Summary of drivers for both collaboration and competition



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.