Structure and sustainability: An analysis of the organisation of educational technology leadership and support at Australian universities

Philip M. Uys and Matthew Campbell
Centre for Enhancing Learning and Teaching (CELT)
Charles Sturt University, Australia

Abstract

The paper presents an analysis, with reference to sustainability, of the way in which educational technology leadership and support are structured, or organised, at the 39 Australian universities. This analysis is contextualised and anchored within literature relating to the structures and organisation of educational technology and universities. The analysis covers single mode universities focusing on on-campus or distance delivery as well as dual mode universities and deals with organisational positioning of educational technology leadership and support; standing of educational technology leadership and support; staffing type and nature of support; focus of educational technology leadership and support. Sustainability of educational technology leadership and support at universities requires, and needs to be balanced with, effective organisation and structure. The structure needs to be responsive to both internal and external developments.

Introduction

The paper presents an analysis, with reference to sustainability, of the way in which educational technology leadership and support are structured, or organised, at the 39 Australian universities. This analysis is contextualised and anchored within literature relating to the structures and organisation of educational technology and universities. The findings have developed from a case-study approach using a web scan of the Australian universities. The analysis covers both single mode universities focusing on on-campus or distance delivery, as well as dual mode universities, and deals with:

- Organisational positioning of educational technology leadership and support.
- Standing of educational technology leadership and support.
- Structural approach.
- Staffing type and nature of support.
- Focus of educational technology leadership and support.

Structure and sustainability

The provision of educational technology leadership and support in higher education is complex. Even the nature of the change process from conventional learning to technologically enhanced learning is not stable. Morrison (1995) describes this process in terms of dislocations, dilemmas and uncertainties rather than progression from 'what is' to 'what is needed'. Change processes require specific structures and models to be sustainable (Rogers, 1995; Szabo, Anderson, & Fuchs, 1997; Uys, 2001)

Inflexibility of structures, might lead to services that cannot be sustained in a rapidly changing environment. One analogy of the relationship between organisational structure and sustainability is that of a skeleton and the rest of the body. The body cannot sustain itself without the support of the skeleton and similarly structure supports sustainability in an organisation, and more specifically, in educational technology leadership and support. This analogy emphasises the importance of a high level of flexibility within the structure to be sustainable and the need for the structure to change as the organisation develops. The organisation of educational technology leadership and support is, however, located within university structures that are not very pliable, which poses a significant challenge for sustainability of educational leadership and support.

Patterson (1997, p. 7) studied the university's evolutionary dimensions and suggests that:

> The historic continuity of the institution is unbroken, and many of the medieval university's unique features remain characteristic of today's universities: features, for example, such as the university's status as an autonomous corporate body; its legal identity; recognition by others leading to the award of recognised degrees or diplomas; the degree structure and levels, e.g. bachelors leading to masters, and doctorates; testing by examination; and structures of governance, such as the division of major branches of learning into faculties, and the hierarchical positions such as deans, chancellor and rector.

Universities are further often highly bureaucratic. Garrison (1989, p. 38) points to higher education when contending that as '…formal education grew in size and complexity, bureaucracies became the controlling mechanism', while Paul (1990, p. 31) shares this view that '…universities exhibit many of the characteristics of bureaucratic organizations'.

An effective approach to educational technology leadership and support needs not only to be developed to be pliable, but also respond to the context and culture of an organisation (Gunn, 1998, p. 142; Pettit & Hind, 1992, p. 19; Uys, 2000; Uys, Nleya, & Molelu, 2001; Woodhouse, 1999). The culture of an organisation refers to '…the values, beliefs, practices, rituals, and customs of an organization' (Marquardt, 1996, p. 24) and could be unique to an organisation. The culture of an organisation is both reflected and supported by its organisational structure.

Bates (2000, p. 42) highlights the importance of leadership to create a sustainable technological change process and asserts: '…the widespread use of new technologies in an organization does constitute a major cultural change. Furthermore, for such change to be successful, leadership of the highest quality is required'. Cultural change also affects and needs to be supported by related changes in organisation and structure; in fact Peter Drucker (1998, p. 157) describes the fundamental task of management as one of empowerment that includes the provision of an appropriate structure: '… to make people capable of joint performance by giving them common goals, common values, the right structure, and the ongoing training and development they need to perform and to respond to change'. This is in line with other writers on management (Boone & Kurtz, 1984; Newman, Warren, & McGill, 1987; Schultheis & Sumner, 1989) who concur that the management process includes four key functions namely planning (decide what must be done), organising (organisational structure), leading (ensuring that it is done) and control (determine whether instructions have been followed).

A systems approach to the provision of educational technology leadership and support requires an analysis of the structure and organisation of such leadership and support as elements of a system that also includes strategy, technology, people and management processes (Morton, 1991; Yetton (1993). Uys (2003) highlights the '… appreciation of the systemic nature of the infusion of instructional technologies for open learning' as one of the three critical success factors for the infusion of educational technology. Bates (2000) contends '… using technology to extend the campus on a global basis will affect all aspects of a university or college, but particularly administrative systems'. Systems theory in general (Bertalanffy, 1968) also calls for an integrated approach to technological innovation in higher education since a system is defined as a whole that cannot be effectively studied without studying all of its parts as well as the whole.

The organisational structure of educational technology leadership and support in higher education requires closer investigation.

Organisation and structure of educational technology leadership and support

Literature on possible structures for educational technology leadership and support has been studied with regards to both single mode universities focusing on on-campus or distance delivery as well as dual mode universities.

Bates (1984) describes the organisational model of traditional distance institutes as being centralised but asserted that these new technologies offer the possibility of an alternative model to the large, centralised and specialised distance education system. Garrison (1989, p. 38), in view of the new technologies and the coming of the information age, postulated that education '… is experiencing a shift from formal, centralised, and segmented operations to increasingly complex, decentralised, and integrated levels of organisation'. Peters (1993, p. 53) contends that in the post-industrial society there will be in distance teaching institutions a '… departure from a highly centralized organization of the teaching-learning process and a move to small decentralized units which can be made transparent by the means of new technology'.

The team concept in management and organisational structure is proposed by Peters (1988) for the modern organisation in order to be more responsive. Peter Drucker (1998, p. 125) asserts that because information-based organisations consist of knowledge specialists, '… the modern organization cannot be an organization of boss and subordinate. It must be organized as a team'. Hayes and Watts (1986, p. 34) describe work in the post-industrial firm as work that '… will be undertaken in small, semi-autonomous, task-oriented units linked by computers to a central base'. Tapscott (1996, p. 54) indicates that '…the business team is central to the new enterprise'.

In terms of an organisational structure to support the implementation of technological innovation, Taylor, Lopez and Quadrelli (1996) propose three possible implementation approaches of 'flexible delivery options' in higher education:

- The *integrated approach* with a central unit managing the integration of teaching and learning with IT, emphasising support for professional development in educational and information technologies and linking it to university goals.
- The *parallel approach*, creating an IT-based teaching and learning unit which operates separately and in parallel with existing staff development units.
- The *distributed approach*, which is more 'bottom up' and devolves responsibility for IT-based teaching and learning developments to local innovators across a range of faculties and units.

The 'integrated approach' above is essentially a centralised approach while the 'distributed approach' above describes a decentralised approach rather than a true distributed approach.

More recent approaches emphasise the need for distributed approaches. Uys (2004) uses the concept 'networked educational management' to describe a distributed structure of educational technology leadership and support that operates as a network across university campuses and represented in every faculty/school. A central unit coordinates the activities of the localised support entities. A true distributed structure links to recommendations by Bates (2000) who proposes a fairly large professional centre with small flexible units of technical support and generalist educational technology support within each faculty. The centre will operate on a project management model with many of its staff seconded to work in the faculties on a continuing basis while the units will provide immediate support and find appropriate support from the centre for bigger projects.

Bates (2000) acknowledges the challenge to create a congruity between centralised and decentralised management aspirations in higher education: 'When it comes to organisational structures, the challenge is to develop a system that encourages teaching units to be innovative and able to respond quickly to changes in subject matter, student needs, and technology. At the same time, redundancy and conflicting standards and policies across the institution must be avoided' (p. 181).

We now need to consider how educational technology leadership and support are organised at the 39 Australian universities.

Findings

A case study approach to the analysis of educational technology leadership and support at the 39 Australian universities was employed. A web scan was used to obtain the information. The web scan included the websites of the 39 universities, as well as institutional profiles located on the Australasian Council on Open, Distance and e-Learning website (2005). The rationale for using a web scan was to gather broad data across all 39 universities. This study could be followed up by an in-depth survey to probe into more complex relationships of the structural elements. Below are the findings on how educational technology leadership and support are organised at the 39 Australian universities.

Organisational positioning of educational technology leadership and support

This criterion refers to the organisational structure of the university and reflects the reporting structure of educational technology leadership and support. The categories that became evident was where educational technology leadership and support, or the unit within which it is located, report to the [Pro or Deputy] Vice-Chancellor (Academic). Within this category the title often varied but the essential function to ensure the academic rigor of the university was the common factor. The second category were where educational technology leadership and support operate as independent bodies often providing external services and charging university faculties for services; educational technology leadership and support units were also often located in the general services/administration area of the university, with no reporting structure to academic executives. The final category of 'other' contains for example the Pro-Vice-Chancellor (Information Technology).

The prevailing organisational positioning of educational technology leadership and support at Australian universities in terms of reporting is to the Deputy Vice-Chancellor (Academic). However, this was not indicative of the academic standing of the staff within the unit, with staff in the majority of cases classified as 'general' or 'administration' staff. Reporting to a senior manager in general services follows very closely.

Table 1: Organisational positioning of educational technology leadership and support

	DVC (Academic)	Independent	General services	Other	Unknown
Number	15	2	13	2	7
Percentage of total (n=39)	38.5	5.1	33.3	5.1	17.9

Standing of educational technology leadership and support

Standing refers to whether educational technology leadership and support operate as an independent unit or are integrated within a larger unit. It does not refer to the overall positioning in the organisational structure of the university. Where educational technology leadership and support were classified as standalone the unit had its own management structure and reported directly to the university executive. Integrated educational technology leadership and support are seen a subset of the total functions of a bigger unit, usually a learning and teaching centre.

The historical organisational development of universities seems to have had an influence upon the positioning of the educational technology unit. The dominant positioning of educational technology leadership and support at Australian universities is within learning and teaching centres.

Table 2: Standing of educational technology leadership and support

	Standalone	Integrated	Unknown or not stated
Number	9	26	4
Percentage of whole (n=39)	23.1	66.7	10.3

Structural approach

The structural approach describes the internal organisational structure of the educational technology leadership and support as being centralised, distributed or decentralised. 'Centralised' is when educational technology leadership and support have all staff working under the direction of one manager or director and within close physical proximity of each other. The educational technology leadership and support of the vast majority of Australian universities are located within central bodies in which there exists a core staff group that 'consulted' with, and to, academics. This confirms the view that Universities, in general, are highly bureaucratic (Garrison, 1989; Paul, 1990). The current practice is further out of kilter with the recommendations of Bates (2000) and Uys (2004) to follow a more distributed approach.

Distributed educational technology leadership and support occurs when these are either distributed across physical campus divisions but aiming towards a centralised goal, or when staff are located within schools and faculties and reporting centrally to management. Universities with multiple campuses tended to have their educational technology leadership and support operating in a non-centralised manner.

Table 3: Structural approach

	Centralised	Distributed	Decentralised	Unknown
Number	23	9	2	5
Percentage of whole (n=39)	59.0	23.1	5.1	12.8

Staffing type and nature of support

This refers to the type of staff that make up the unit. Where the staff were teaching academics or classed within the academic criteria the unit was designated as academic. When the staff of the unit were service based and not teaching, regardless or qualifications, the unit was classed as general support. A mixed unit was made up of approximately half of each. Most units had elements of academic and non-academic staff with most directors being academics emphasising the academic nature of the work of learning and teaching centres. The units that were classed as 'academic' or 'mixed' tended to be present in universities with less of an emphasis on flexible or distance education. The majority of universities in Australia view educational technology leadership and support as part of the general services of the university.

Table 4: Staffing type and nature of support

	General support	Academic	Mixed	Unknown
Number	23	5	5	6
Percentage of whole (n=39)	59.0	12.8	12.8	15.4

Focus of educational technology leadership and support

A range of foci are illustrated in the vision/mission and/or overall service formulation of educational technology leadership and support at Australian universities. This finding seems to support the views of those who call for diversity among modern universities such as Cass (1996, p. 10) who believes in the context of post-modernity, that in Australia 'no single idea of the university is possible any longer' and that we need '… plural ways of thinking about them'. This is particularly evident when comparison is drawn between the 'sandstone' and metropolitan universities whose predominant focus is upon internal delivery and the emerging non-metropolitan, regional universities that have grown significant distance and flexible education delivery modes.

Within these two larger groups smaller subsets and individual differences between universities are, however, evident. The university structure and positioning of educational technology leadership and support within this structure impacts highly upon its mission and focus.

In the case of educational technology leadership and support operating as stand-alone units, the focus is on learning resource development and include:

- Provides support for the development of flexible learning resources.
- Develop e-learning and staff development.
- Academic and resource development.
- Assistance in Educational design, media production and WebCT.
- To support learning by using progressive multimedia and online technology.
- We pride ourselves on our breadth of skills and understanding of sound educational media and our ability to apply that knowledge for the benefit of our clients.

In the case of integrated educational technology leadership and support within learning and teaching centres, the focus is wider and deals with enhancing the quality of learning and teaching and include:

- To strategically enhance learning and teaching at [university] by providing enabling leadership and support to the academic community.
- Development of teaching resources.
- Enhance quality of teaching.
- Innovative teaching.
- Development of teaching resources material production.
- Position [university] as leader of DE and flexible approaches.
- Develop academic's skills in delivery of T&L.
- Promoting [university] as a centre of best practice and innovation.
- Support university educational goals and engagement of scholarship in learning.
- Enhance and ensure the quality of learning and teaching.
- Advocates and supports pedagogically appropriate flexible approaches to learning and teaching at [university].
- The Centre provides support and programs for academic staff in their professional development in teaching and learning, research and academic leadership, in a rapidly changing environment.
- Aims to provide leadership and support for the enhancement of learning, teaching and scholarship across the University.
- A major focus within the TLC is the promotion of flexible teaching and learning through the application of new technologies and the enhancement of traditional teaching modes.
- Provides leadership and support for the advancement of Teaching and Learning at [university].

The integrated approach seems preferable given the resultant pre-eminence of learning and teaching considerations.

The need for reform of the organisation of educational technology leadership and support

The current organisation structures at Australian universities around educational technology leadership and support that has emerged above might need to change in an era of educational reform in view of growing globalisation and transnational exchanges in many fields (Marquardt, 1996, p. 3).

Ponder and Holmes (1999) similarly comment on the turbulence of the marketplace and the adaptive management structures this environment requires of the school system, which also seems to be highly relevant to higher education. They claim that new technologies and scientific break-throughs will cause a constant reshaping of the 21st century marketplace, and the ideal school system will need to be capable of rapidly reinventing itself to accommodate this continuously changing world. Therefore educational institutions and structures will need to be malleable and constructed in a way that allows them to be easily and quickly reorganised and rebuilt.

Pressures for open learning as described by Lewis (1992, p. 14) as a conglomeration of educational approaches that aims to transcend the traditional barriers of higher education, namely physical, educational, individual and financial barriers calls for more flexibility, also in structure and organisation. Changes in structure and organisation, also of educational technology leadership and support, is necessary to overcome the traditional barriers in higher education that Lewis point out such as specific locations and times, sequencing of the content and method of delivery, lack of awareness of what is available and costs of course materials. Scholars like Evans and Nation (1993, p. 7) indicate that in '… these circumstances politicians, policy-makers and citizens are making demands upon education systems to reform'.

Learners are further required to take on new roles and responsibilities, which in higher education is in contrast to the predominant teacher-centric delivery approaches that learners were accustomed to in their secondary school career. Online learning for instance encourages networking among learners, which Hodgson, Mann and Snell (1987, p. 165) refer to in the context of open learning as 'expert networking'. They perceive the use of '… new technology as a vehicle for the sharing of discoveries, developments and reference materials among an expert network of peer specialists'.

The new technologies in global education leads according to Mason (1998, p. 157) to information being '… no longer something to organise, transmit and memorise, but something to work with, think with, discuss, negotiate and debate with partners'. Structures need to respond to support new ways of learning. Structure around educational technology leadership and support at universities need to further respond to emerging concepts of the learning organisation (Senge, 1990), which is critical in the turbulent and dynamic environment of educational technology developments. In learning organisations the management needs to be highly adaptive. Marquardt (1996, p. 1) indicates that learning organisations:

> enjoy greater knowledge, flexibility, speed, power, and learning ability to better confront the shifting needs of a new environment, more demanding customers, and smarter knowledge workers. This new species of organisation will be the *learning organisation* and will possess the capability to anticipate and adapt more readily to environmental impacts …

Marquardt (1996, p. xv) further contends that in this '…faster, information-thick atmosphere of the new millennium… "old" companies [cannot] compete with more agile and creative learning organizations'. A learning organisation has a streamlined, flat hierarchy and is seamless and boundary-less (Marquard, 1996, p. 83ff). It is further built on networking and '… realize[s] the need to collaborate, share, and synergize with resources both inside and outside the company … they provide a company with a form and style that is fluid, flexible, and adaptable'. Learning organisations will enjoy greater knowledge, flexibility, speed, power, and learning ability to better confront the shifting needs of a new environment, more demanding customers, and smarter knowledge workers.

Universities in Australia will therefore need to evaluate their current structures of educational technology leadership and support in the light of what Thomas, Carswell, Price and Petre (1998) term the '… transformation of practices (both teaching and administrative) to take advantage of technology in order to provide needed functions, rather than superficial translation of existing practices'. Higher education in Australia will therefore have to engage in what Bates (1999) indicates as '… a thorough re-examination of the core practices of the organisation, from advertising, to registration, to design and delivery of materials, to student support to assessment of students, in order to analyse the most effective way of providing these services in a networked, multimedia environment'. The findings of this study confirm the need for transformation of practices from centralised approaches to more distributed and networked approaches in line with the recommendations of Marquardt (1996), Bates (2000) and Uys (2004).

Conclusions

The typical approach to educational technology leadership and support in Australian universities at present can be summarised as:

- reporting to the DVC (Academic) or to a senior manager in general services
- integrated within a learning and teaching centre
- comprised mainly of support or administration staff and viewed as part of general services
- having centralised operations, and
- focusing on increasing the quality of learning and teaching.

There is, however, a high probability that both internal and external pressures will demand that current structures and organisation of educational technology leadership and support transform towards more distributed approaches. Transformation within universities may further have to address the academic stature of the staff within educational technology leadership and support. This transformation will need to be in line with the principles of the learning organisation to enable educational technology leadership and support to be highly adaptive, effective and responsive.

References

Australasian Council on Open, Distance and e-Learning. (2005). Retrieved July 27, 2005, from http://www.acode.edu.au

Bates, A. W. (1984). *New technology and its impact on conventional and distance education.* Papers on information technology, No. 237. Walton, UK: Open University. [ERIC Document Reproduction Service No. ED 258 966]. [Subsequently published in Garrison, D.R. (1989). *Understanding distance education: A framework for the future.* London & New York: Routledge.]

Bates, A. W. (1999). *Strategies for the future.* Retrieved September 7, 2003, from http://bates.cstudies.ubc.ca/strategies.html

Bates, A. W. (2000). *Managing technological change: Strategies for college and university leaders.* San Francisco: Jossey Bass.

Boone, L. E., & Kurtz, D. L. (1984). *Principles of management* (2nd ed.). New York: Random House.

Cass, B. (1996). Preface. In T. Smith (Ed.), *Ideas of the university*. Sydney: University of Sydney.

Drucker, P. F. (1989). *The new realities — in government and politics, in economics and business, in society and world view.* New York: Harper & Row.

Evans, T., & Nation, D. (1993). *Reforming open and distance education: Critical reflections.* London: Kogan Page.

Garrison, D. R. (1989). *Understanding distance education: A framework for the future.* London & New York: Routledge.

Gunn, C. (1998). Virtual technologies in higher education: Vision or reality?. In M. Peters & P. Roberts (Eds.), *Virtual technologies and tertiary education* (pp. 134–145). London: Routledge.

Hodgson, V. E., Mann, S. J., & Snell, R. (Eds.). (1987). *Beyond distance teaching — towards open learning.* Milton Keynes, UK: Open University Press.

Lewis, R. (1992). What is open learning? In A. Tait (Ed.), *Key issues in open learning* (pp. 11–23). Harlow, UK: Longman.

Marquard, M. J. (1996). *Building the learning organization: A systems approach to quantum improvement and global success.* New York: McGraw-Hill.

Mason, R. (1998). *Globalising education: Trends and applications.* London & New York: Routledge.

Morrison, T. R. (1995). Global transformation and the search for a new educational design. *International Journal of Lifelong Education, 14*(3), 188–213.

Morton, M. S. (Ed.). (1991). *The corporation of the 1990s: Information technology and organizational transformation.* New York: Oxford University Press.

Newman, W. H., Warren E. K., & McGill, A. R. (1987). *The process of management: Strategy, action, results.* Englewood Cliffs, NJ: Prentice Hall.

Patterson, G. (1997). *The university from ancient Greece to the 20th century.* Palmerston North, NZ: Dunmore Press.

Paul, R. H. (1990). *Open learning and open management: Leadership and integrity in distance education.* London: Kogan Page.

Peters, O. (1993). Distance education in a post-industrial society. In D. Keegan (Ed.), *Theoretical principles of distance education* (pp. 39–58). London: Routledge.

Pettit, D., & Hind, I. (1992). Reorganising the delivery of educational services and educative leadership. In P. A. Duignam & R. J. S. Macpherson (Eds.), *Educative leadership: A practical theory for new administrators and managers*. London: The Falmer Press.

Ponder, G. A., & Holmes, K. M. (1999). *Purpose, products, and visions: The creation of new schools.* Retrieved August 31, 1999, from http://www.ilt.columbia.edu/ilt/papers/Ponder.html

Rogers, E. (1995). *Diffusion of innovations* (4th ed.). New York: Free Press.

Schultheis, R., & Sumner, M. (1989). *Management information systems: The manager's view.* Boston: Irwin.

Senge, P. M. (1990). *The fifth discipline: The art and practice of the learning organization.* London: Century Business.

Szabo, M., Anderson, T., & Fuchs, A. (1997). *A change system: The training, infrastructure and empowerment system: (TIES).* Retrieved July 10, 2003, from http://www.quasar.ualberta.ca/edmedia/TIES/TIES_Report.html

Taylor, P., Lopez, L., & Quadrelli, C. (1996). *Flexibility, technology and academics' practices: Tantalising tales and muddy maps.* Canberra: Evaluations and Investigations Programme, Department of Employment, Education, Training and Youth Affairs. Retrieved June 20, 1998, from http://www.anu.edu.au/uniserve/eip/muddy/muddy.html

Thomas, O., Carswell, L., Price, B., & Petre, M. (1998). A holistic approach to supporting distance learning using the Internet: Transformation, not translation. *British Journal of Educational Technology, 29*(2), 149–161.

Uys, P. M. (2000). *Towards the virtual class: Key management issues in tertiary education.* Unpublished PhD thesis, Victoria University of Wellington, New Zealand.

Uys, P. M. (2001). *LASO (leadership, academic & student ownership and readiness) model for technological transformation in tertiary education* [Online]. Retrieved July 1, 2004, from http://www.globe-online.com/philip.uys/LASOmodel.htm

Uys, P. M. (2003). *Critical success factors in the infusion of instructional technologies for open learning in development settings: The case of the university of Botswana.* Retrieved April 25, 2005, from http://www.irrodl.org/content/v4.2/uys.html

Uys, P. M., Nleya, P. N., & Molelu, G. B (2003). Technological innovation and management strategies for higher education in Africa: Harmonizing reality and idealism. *Educational Media International, 40.*

Uys, P. M. (2004). A syntagm of networked educational management: Case study — University of Botswana. *Campus Wide Information Systems (CWIS), 21*(1), 22–28.

Von Bertalanffy, L. (1968). *General systems theory: Foundations, development, applications.* New York: George Braziller.

Woodhouse, D. (1999). *Summary of virtual conference on accreditation, quality assurance and credit banking.* Vancouver: Commonwealth of Learning. [In Butterfield, S., Chambers M., Moseley, B., Prebble, T., Uys, P., & Woodhouse, D. (1999, July). *External quality assurance for the virtual institution.* AAU Series on Quality, No. 4. Auckland: Academic Audit Unit.

Yetton, P. (1993). *Managing the introduction of technology in the delivery and administration of higher education.* Retrieved June 20, 2004, from http://www.deetya.gov.au/divisions/hed/operations/eip9703/front.htm

Acknowledgments

Author contact details

Philip M. Uys, PhD
Manager, Educational Design and Educational Technology
Centre for Enhancing Learning and Teaching (CELT)
Charles Sturt University
Panorama Ave, Bathurst, NSW 2795, Australia

Email: puys@csu.edu.au
Phone:+61 (02) 6338 4538
Fax: +61 (02) 6338 4342
http://www.csu.edu.au/division/celt
http://www.globe-online.com/philip.uys

Matthew Campbell
Educational Designer
Centre for Enhancing Learning and Teaching (CELT)
Charles Sturt University
School of Policing Studies
McDermott Drive, Goulburn NSW 2580

Email: macampbell@csu.edu.au
Phone:+61 (02) 4823 2963
Fax: +61 (02) 4823 2786
http://www.csu.edu.au/division/celt