Tools for survival in a changing educational technology environment

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This conference provides a unique opportunity to capture a snapshot in time of where we are in the educational technology landscape. Landscape denotes static, a snapshot in time. However, the educational technology environment is dynamic and constantly changing. While at times the technological change and demands for technological change can be overwhelming, change needs to become an accepted, integral and well managed part of our educational environment. Concepts presented here have been taken from the environment management discipline and are used as metaphors for understanding change and transformations in technology enhanced learning environments. The strong environmental metaphor and associated language has been deliberately chosen because it helps us to focus on our key role as educators which is to create the best possible learning environment for our students.

This paper introduces a social ecological systems analysis approach to understanding changes in organisations and the impact of outside factors on our learning environment. The *Adaptive Cycle Framework* is introduced as a predictive tool for understanding changes and transformations in our educational technology environment, and to thus determine a pathway to maximise opportunities afforded by change. This paper draws on an ongoing PhD study in which the focus is on managing change in technology enhanced learning environments. The Adaptive Cycle Framework is illustrated within the context of a case study of a regional university's changing educational technology environment as a means to better manage for the long term.

Keywords: learning environment, learning management system, management, educational technology, adaptive cycles, social ecological system

Introduction

At times the constant change in educational technology can be overwhelming. The educational technology environment is becoming increasingly complex and this poses significant challenges for everyone from institutional and organisational managers, vice-chancellors, faculty heads, academics, and students themselves. What technology does one need to remain competitive? What can the institution afford? Is there sufficient support for users of new technology? How many more new programs must one learn to use? How much is the new technology being used? Is it actually enhancing learning? Is it improving the learning environment? Institutional fiscal resources for the provision and support of educational technology are finite and have been identified as a top IT issue in education for some years (Bruininks 2005; Camp, 2007; Dewey, DeBlois, & Committee, 2006). Where resources are scarce one needs to learns to use what one has available to its full potential and to make wise investments. There are instances where institutions have invested in expensive learning management systems (LMS) and other technologies yet report limited uptake and enhancement to teaching and learning (Benson & Palaskas, 2006; Zhou & Xu, 2007). Technology on its own is not the answer. Success comes through how it is used and, importantly, how it is introduced and managed.

In an age where we are promised that the latest gadget, program or mobile technology will enhance our student learning, educational technology can unglamorously be defined as simply a collection of ICT (information communication technology) tools. However, it is what one can do with the tools that is important: the facilitating of communication and interactions, creation of content, the design of learning experiences and the recording of progress in achieving learning outcomes. In other words, educational technology is a fundamental part of the learning environment.

By introducing theory and practice from the natural resource management discipline, this paper explores new ways to understand the changes within the educational technology environment with the aims of better management and ensuring that the changes impact positively on the learning environment itself. A social-ecological systems approach (Holling, 1973, 1996) is introduced as a holistic approach to understanding the complexity of the broader educational environment so that appropriate management decisions can be made. It is acknowledged that the application of theory from one discipline to another will have limitations, but it is believed that social-ecological systems analysis has merit as a metaphor for understanding our educational systems. This forms part of an ongoing research study in which the author is working towards a better understanding of managing change in the technology enhanced learning environment (Buchan, 2008a).

Within a descriptive case study of Charles Sturt University's educational technology environment the *Adaptive Cycle Framework* will be introduced as a systems analysis tool for understanding and managing the dynamics of the educational technology environment. The Adaptive Cycle Framework is a predictive tool for understanding changes and transformations in our educational technology environment. Once we know where we are in the adaptive cycle, we can then identify what interactions are taking place, what factors might impact on our immediate environment and to thus determine a possible pathway towards a cost-effective delivery of an improved learning environment.

Social-ecological systems

A social-ecological system may be described as the interaction between two systems namely, social systems and ecological systems (Cumming, Cumming, Cumming, & Redman, 2006). Social-ecological systems analysis provides a way of identifying the possible causes and effects at a variety of levels of changes in the environment. Walker et al (2006a) identify five preliminary heuristics that can be used to explain patterns of change in complex social-ecological systems. (1) Adaptive cycles and (2) panarchy are used to describe the dynamics of systems; while (3) resilience, (4) adaptability and (5) transformability are given as heuristics to describe the properties of social-ecological systems that determine these dynamics. This paper aims to explore the first of these, adaptive cycles. The dynamics of our educational technology environment will be explored through analysis and application of adaptive cycles. The Adaptive Cycle Framework will be introduced as a systems analysis tool for understanding and managing the dynamics of the educational technology environment.

The ecological system or ecosystem, is identified as the organisation that effectively supports the learning environment (Figure 1). The boundary of the ecosystem can be drawn at a number of levels according to the level of control. In this case study the ecosystem for the Vice-Chancellor is the whole organisation, the University. For a Dean it is the faculty, for a Head of School it is the school, while for the lecturer it might be the (virtual) class or subject/course. Within each of these discrete ecological systems exists a set of physical resources, social interactions and dynamics that make up the whole system (Figure 1). "The learning opportunities of students are optimised by the expert shaping of learning environments within a particular course or program of study." (University of Western Australia, 2005). Those elements of the learning experience which are under the control of the teacher can positively influence the way students approach their study and the consequent learning outcomes (Lizzio, Wilson, & Simons, 2002). Outside of this one cannot control things, but can only manage for the impact or effect on the learning environment itself.

Introducing adaptive cycles

Discussion of adaptive cycles will firstly be grounded in the ecological and social context within which it was developed and then illustrated through a case study. We all move through different phases in the cycle of life. There are cycles in nature and ecosystems, social systems and families have cycles, organisations and businesses have cycles. We exist as part of systems which have cycles occurring at a range of scales in time and space. Walker and Salt (2006) note that the various cycles have a number of similarities. Identifying cycles is important for recognising that things happen in certain ways according to the phase of the cycle the system happens to be in. Sometimes things change gradually, sometimes rapidly. Sometimes surprises and changes are more likely, sometimes innovation has a better chance of taking off. By studying ecosystems around the world researchers have learned that most ecosystems go through recurring cycles consisting of four phases. These are called adaptive cycles (Figures 2 and 3).

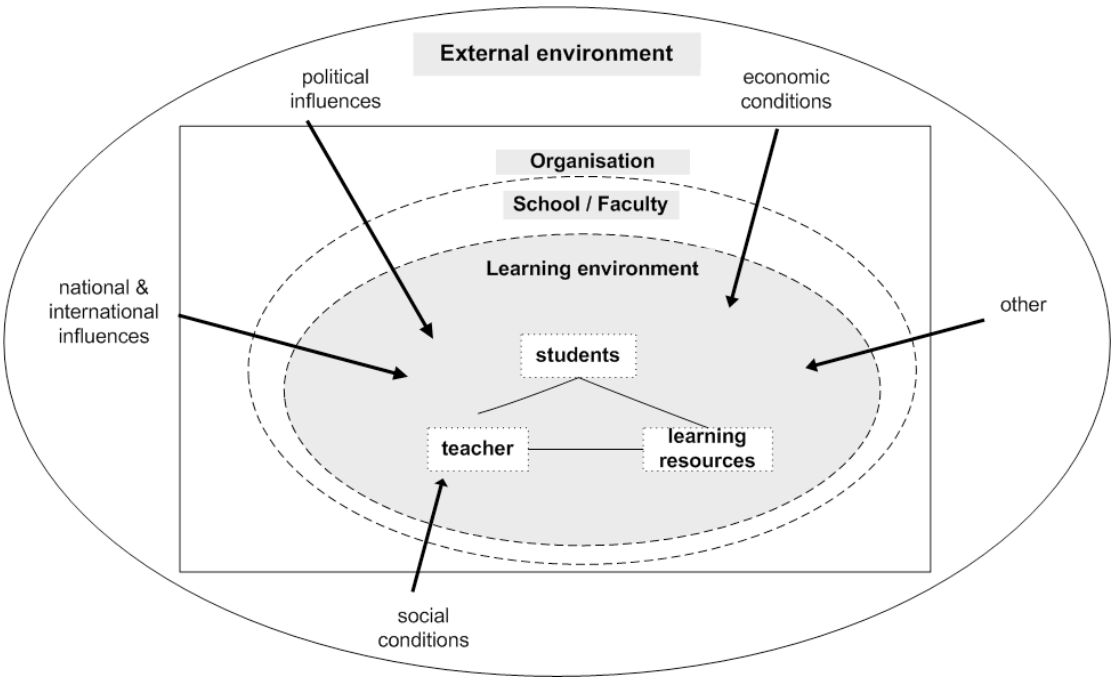

Figure 1: The relationship between the learning environment, the organisation and the external environment

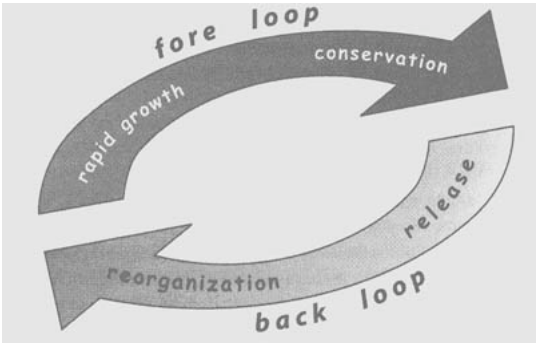

Figure 2: A simple representation of the adaptive cycle (Source: Walker & Salt, 2006, p.82)

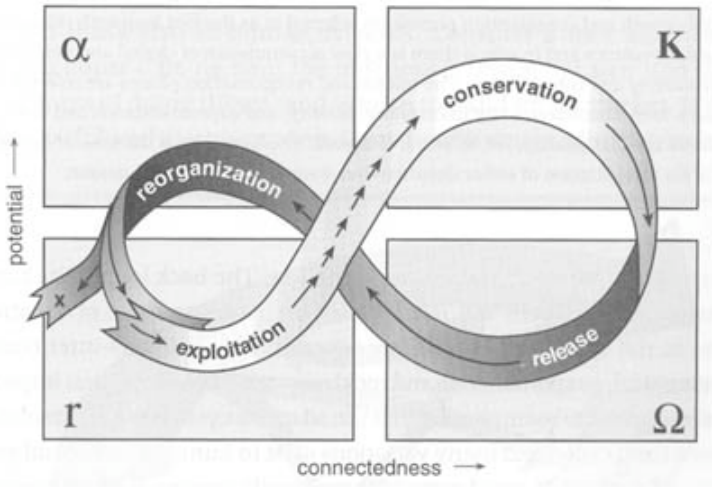

Figure 3: The adaptive cycle (Source: Walker & Salt, 2006: p.81)

At its simplest, the dynamics of an ecosystem can be illustrated through the adaptive cycle which has two opposing modes: a development loop, the fore loop, and a release and reorganisation loop, the back loop (Figure 2). The development, or fore loop, is made up of the r and K phases. First the exploitation (r) phase, which is a phase of rapid growth. This is characterised by readily available resources, the accumulation of structure and processes relatively loose connections between components and the existence of high resilience. As structure and connections in the system increase, more energy and resources are needed to maintain them. In nature this corresponds to the establishment of opportunists such as weeds and consequent ecological succession with an increasing variety and change in dominance of species. In societies and organisations these equate to a period of rapid growth as people exploit new opportunities and available resources.

The second phase is the conservation (K) phase which is usually the longest phase. The potential of capital, resources and energy stored in the system increase over time as a system moves towards the peak of the conservation phase (figure 3). Net growth slows and the system becomes increasingly connected, less flexible and thus more vulnerable to external disturbances. Disturbances and changes lead to the third phase, the release (Ω) phase, which is a period of release of bound-up resources in which the accumulated structure collapses. This is followed by the fourth phase the reorganisation (_) phase in which innovation and novelty can take hold, and leading eventually to another growth phase in a new cycle.

Observation of a system leading to identification of where the system, or parts of the system are in relation to these phases is an important part of being able to understand the system. The adaptive cycle provides a tangible way of predicting the behaviour of the system, thus contributing to developing better management practices. A systems approach to organisational management is not new (Kast & Rosenzweig, 1970). However, the focus in this study is on the learning environment and how one maintains the integrity of this within the context of the broader organisation within which it is situated when, just as in our natural environment, there are competing uses and requirements for resources within the educational environment and often poor communication between users (Buchan, 2008b).

Case Study

The new theory that is being presented will now be grounded in practice through a case study of Charles Sturt University that forms part of ongoing Ph.D. research.

The research approach

This qualitative research study is grounded in the ethnographic approach common in educational settings (Walter, 2006; Wiersma, 2000). In a phenomenological approach the author's experiences and the individual perspectives of others at CSU have been recorded in order to describe and understand the learning environment and to come to a common understanding of managing the learning and broader educational environments. Throughout 2007- 2008 observations were made and a reflective journal kept in key meetings, presentations and other informal gatherings. Together with analysis of key documents, this data has been used to document a picture of the CSU online learning environment and issues associated with technological change. Structured interviews have been used to gather data on individual perspectives. While every effort has been made to analyse and report accurately, it is acknowledged that in the early contextualisation of this new theory within the CSU context the opinions reflect those of the author and are not an official position of the University.

The context

There has been considerable and ongoing change at CSU in recent years. Charles Sturt University is a multi-campus, inland university with five main campuses (Bathurst, Wagga Wagga, Albury-Wodonga, Orange and Dubbo), four specialist centres (Manly, Goulburn etc.) and study centres in some main cities. CSU also has a campus in Ontario, Canada, as well as links with international partner institutions. The University has approximately 32,000 students of whom two-thirds are enrolled as distance education (DE) students. CSU is responding to changes in the broader higher education environment in order to establish itself as the National University for Inland Australia (Charles Sturt University, 2006) and is currently undergoing significant and transformative change. This is evidenced through a number of key drivers or changes taking place in the University as part of the long term plan.

The key focus and driver for change is the new University Strategy 2007-2011. Associated with this is a new University Learning and Teaching plan, a New Course Plan and the introduction of two institutes; The Flexible Learning Institute and The Education for Practice Institute (Chambers, 2006). In 2006 there

was a restructuring of the faculties from five to four faculties and the associated establishment of cross-campus schools. In 2008 CSU created a new online learning environment (OLE) called *CSU Interact* through the introduction of a community source learning management system (LMS), Sakai. In order to better serve the learning and teaching needs of the University there will be the formation of a new Division of Learning and Teaching Services in 2009 (Director Employee Relations, 2008; Charles Sturt University, 2008).

There is a strong focus on technological solutions to address the challenges associated with cross-campus schools, cross-campus offerings of subjects and convergence of distance and internal modes of delivery.

The Adaptive Cycle Framework in the whole of university environment

No system exists in isolation but is part of the dynamics of a bigger system in both space and time (Figure 1). The Adaptive Cycle Framework (Figure 4) has been developed as a modified version of the original adaptive cycle. It will now be introduced as a framework for understanding our educational environment within the context of a case study of Charles Sturt University focusing firstly and briefly on the whole University environment, and then in more detail in the context of CSU's online learning environment.

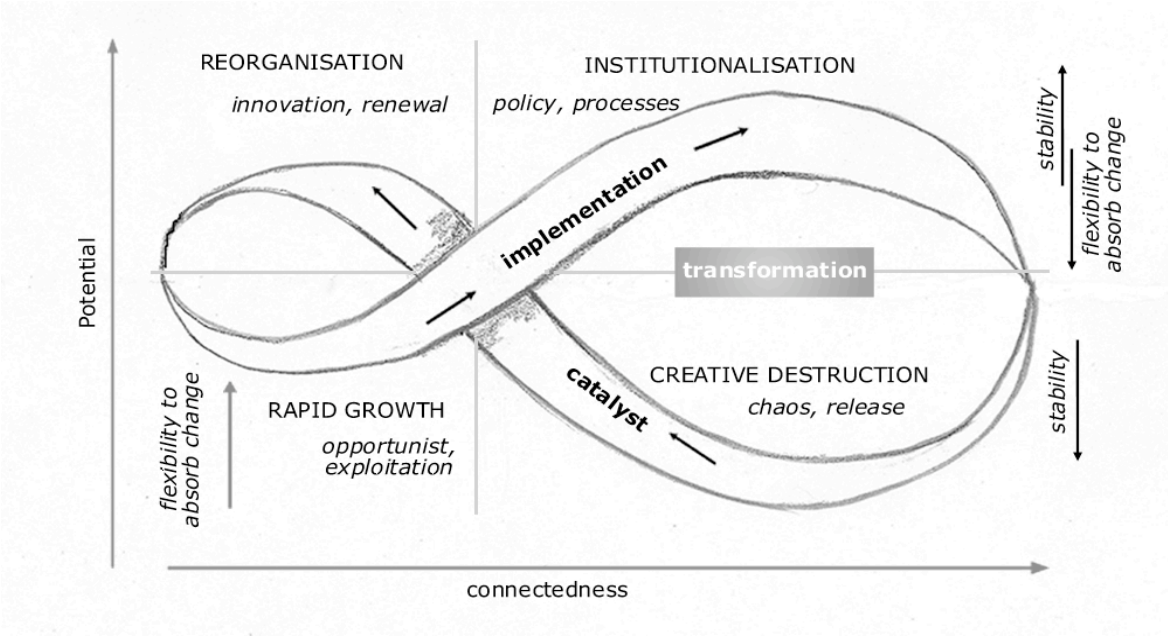

Figure 4: The adaptive cycle framework for learning environments

For some years CSU as an institution could be viewed as having been in the institutionalised (conservation phase) of the adaptive cycle framework. There have been relatively stable relationships, stable divisional and faculty structures and an increase in numbers of local as well as international students. There have been steady, albeit relatively slow, changes in technology and systems in response to changing demands of students and staff. CSU adopted a stated 'cautious approach' to the adoption of technology which has seen it lag behind somewhat where other institutions are in this regard (OLE Programme Team, 2006; Rebecchi, 2005). However, the role of CSU as a multi-campus, dual mode (DE/on-campus) university servicing a largely regional clientele of students puts additional pressure on ICT resourcing.

The institutionalised phase is characterised by strong connections and relationships within faculties and divisions and 'well-built' and relatively inflexible institutional structures. In this phase the competitive edge lies with those specialists who build up the institutional structures and capital, and who reduce the impact of variability through their mutually reinforcing relationships (Walker & Salt, 2006). This is seen at CSU within various divisions and centres associated with the development of distance education materials and IT support. While institutions or ecosystems in the institutionalised phase are stable; because of the strong connections, institutional structures and supporting processes, polices and relationships they are not necessarily well adapted to respond to major change. At CSU, the previous lack of up to date technology such as a standard LMS, lack of adequate ICT facilities to deal with cross-campus delivery of subjects, limited provision for widespread flexible and blended delivery of subjects,

along with a production system for DE print and multimedia resources that is literally creaking under the current processes have been amongst some of the factors that can be identified as being inadequate in allowing CSU to absorb and respond to changes in the educational environment. If CSU were to retain and increase its market share, we needed to do something radical (Goulter, 2005).

In this framework the release phase is referred to as the creative destruction phase. "[T]hrough the brief release phase the dynamics are chaotic. But the destruction that ensues has a creative element." (Walker & Salt, 2006). Stable relationships, processes and institutional structures will be shaken up and uncertainty rules. In nature the transition from conservation to release phase, can happen quickly. For example when a fire or flood goes through the ecosystem. At an institutional or economic level the change may be more gradual. Changes in economic trends, the introduction by competitors of new technologies, or a market shock can adversely affect an industry. In the case study the release phase is part of the forced change and transformative processes taking place as a result of the focus of our University Strategy (Charles Sturt University, 2006), as well as responses to changes in the wider educational environment. This chaotic phase is a catalyst into reorganisation and renewal.

The massive amount of change currently taking place at CSU (both intentional i.e. institute driven, as well as unintentional i.e. due to factors outside of CSU influences or spin-offs from existing changes) (Bryant, 2007) puts our institution firmly in the reorganisation phase of the back loop of the adaptive cycle. Faculties, schools, centres and divisions are being forced into developing ways to do things differently. At an institutional level small, chance events can powerfully shape the future. Inventions, experimentation, innovation and reassortment are the order of the day.

The rapid growth phase follows during which one often sees the transient appearance or expansion of opportunists that capitalise on the existing conditions and opportunity. These species or actors make use of available resources to exploit every possible ecological and social niche (Walker, Gunderson et al., 2006; Walker & Salt, 2006). The system's components are weakly interconnected and its internal state weakly regulated. Parts of CSU are probably just moving out of the reorganisation and into the early rapid growth phase. Some faculties are moving more quickly and perhaps taking more advantage of the opportunities afforded by the change than others. These opportunists are establishing new processes, changing their practice, and capitalising on available resources (such as funding provided from a strategic change budget and accessing support provided by the University through formal training programmes).

CSU is undergoing transformative change. This is forced organisational change from within in response to external factors. As we head towards 2011 we can expect to move further into the institutionalised phase and to see increased stability, the strengthening of new relationships, establishment of new processes and ways of doing things and increased efficiency of practice. However, with increased stability there is the potential for inflexibility and associated vulnerability to change. The challenge is to retain flexibility and responsiveness to change while retaining strong connectedness. This is a measure of **resilience** of the system.

The adaptive cycle framework in the online learning environment

The Adaptive Cycle Framework will now be used to describe CSU's online learning environment. It needs to be noted, however, that no system exists in isolation and other systems and influences will have an impact (Figure 1). In 2008 CSU introduced a learning management system (LMS), the open source Sakai system, for the first time. Prior to this the University had relied largely on in-house developed, loosely connected solutions for its online learning environment.

Institutionalisation phase
With respect to online learning, the University has been in the stable, institutionalised phase of the fore loop for some years. There have been strong connections between certain components which have seen them working somewhat in isolation such as the IT divisional support, educational design support (CELT) and the DE learning resource production (LMC). Over many years CSU has seen the build-up of capital and institutional structures with the development of ICT systems and processes to support the increasing student numbers and in particular, the access for DE students to online learning resources. From 1999 onwards most subjects have been online supported with students able to access information and learning resources online. The University has, until 2008, been firmly in a Web 1.0 delivery mode which is characterised by a one way access to information with limited online tools for academics themselves to provide 'just-in-time' resources, and limited online interaction (Buchan, 2007; Milne, 2007). The online learning environment was known operationally as the virtual learning environment (VLE). It consisted of four main tools: the Forums (discussion board) tool, a basic online Chat tool, the

Flexible Publishing tool and an online multiple choice quiz tool. The entry point for students into the VLE was into a 'document', the online subject outline, which mirrors the print document DE students receive with their learning materials. This provides key information regarding the subject, its assessment and University policies etc. It also provides links to relevant sources of information such as the Library and Student Services.

The centralised systems and production processes supporting the provision of learning resources and information online are complex and strictly timeline dependent in order to manage the quantity of resources to be published. The physical provision of learning resources online is done through a central production unit with CELT educational designers having an important liaison role in the process. Without access to an LMS academics have been unable to provide learning resources online flexibly and during the session using mainstream tools except through the Flexible Publishing tool which was developed in-house for this purpose. This tool has proved popular in providing staff with a source of just-in-time information for students. The uptake surpassed the developers' expectations and it was soon found that the server space allocated to the tool was inadequate. Use of subject websites hosted on school servers and even personal web spaces have been some ways in which individual academics exert some control over the provision of learning resources to students, particularly amongst many IT related subjects.

"The longer the conservation phase persists the smaller the shock needed to end it" (Walker & Salt, p.77). With respect to online learning and its ICT facilities, CSU could be said to have found itself in the 'free fall' stage of the institutionalised loop where the system could no longer sustain itself in its current state and importantly could not respond to the external pressures of changes and competition in the higher education environment. While the warning signs were recognised and formal steps taken to change things, if no formal change had taken place the University would have moved unintentionally into the release phase.

The limitations of CSU's VLE were recognised some years back and various strategies drawn up to move the University forward in this area (Information and Learning Systems committee, 2004; Rebecchi, 2004). In 2006 CSU made the decision to adopt the open source LMS, Sakai. 2007 was the preparation period for the major implementation of Sakai as CSU's new LMS, *CSU Interact*.

Creative destruction phase
In mid-2007 CSU's new Online Learning environment was launched for project sites and research purposes. The launch of *CSU Interact* in December 2007 for all subjects marked the beginning of the creative destruction phase associated with the OLE. Connections and existing interactions were affected, some current production processes changed and a completely new OLE meant all staff and students had to learn to use a new interface and to do some things differently with their teaching. In nature the release phase has a more physical base with the release of nutrients and physical destruction of relationships. "The loss of structure continues as linkages are broken, and natural, social, and economic capital leaks out of the system."(Walker & Salt, 2006). In the case study the analogy is more virtual. The most significant thing being the change to known ways of teaching online, which until the advent of *Interact* had been limited to interaction on the online forums (discussion groups), and greater expectations from students for communication and an online presence in their subjects. The move to *CSU Interact* impacted significantly on support facilities such as CELT, DIT (Division of Information Technology) and Student Services who had to resource the implementation and associated professional development, student support and technical implementation. This necessitated 'challenging' (breaking) the strong relationships and processes within some divisions in order for several divisions and groups to collaborate on one of the biggest IT projects the University has seen.

Reorganisation phase
Following the creative destruction phase the system moves into a phase of reorganisation and renewal. The different areas at CSU are moving through this phase at different speeds. For CELT, DIT and Student Services the reorganisation phase began during the implementation phase in 2007. In CELT educational designers had to step up to new duties and learn new skills in order to be able to provide hands-on professional development within the faculty schools as well as adjust to increased workloads.

We are seeing innovation, experimentation and variety in the way people are teaching using the LMS technology. Those early adopters, people who have been agitating for this type of technology have rapidly integrated it into their teaching (Rogers, 1995). The Faculty of Education has developed a new Early Childhood course which is designed for cross-campus delivery. This means that students on each of three campuses; Albury, Bathurst and Dubbo, are enrolled as a single internal (on-campus) cohort and they learn together. This pushes the boundaries of blended delivery with academics team teaching using a

variety of modes of delivery and technologies including on-site tutorials, self-directed learning with online resources provided through *CSU Interact*, and interactive video teaching (IVT). For survival in the competitive higher education environment this innovation and renewal and providing for tomorrow's teachers will assure the 'market share' for the Faculty.

While many in the Faculty of Education have moved/are moving into the rapid growth phase, elsewhere others are perhaps still feeling the effects of the chaotic creative destruction phase and will move more slowly through reorganisation. It is possible to teach internal subjects with minimal use of *CSU Interact*, and some lecturers continue to use mainly the online forum for student communication. In certain subjects/courses this may be sufficient. However, anecdotally it is being heard that students themselves are pushing the use of communication tools such as Chat and wikis in their subjects and challenging lecturers to communicate and teach more online and interactively.

Those academics not yet availing themselves of the opportunities to re-examine their teaching practices and to do things differently where needed could be seen to have remained in the former institutionalisation phase. Although an LMS is simply a set of tools, it heralds the entry into Web 2.0 technology and the social learning experiences that this affords students and staff. For most institutions this is the base level teaching platform nowadays. Those individuals, schools and faculties who are not adapting to the changed circumstances and availing themselves of the opportunity to improve learning and teaching remain particularly vulnerable to the changing educational environment with students potentially opting to study elsewhere, limits in promotions and loss of subjects from schools.

Rapid growth phase
Moving on from the reorganisation phase, parts of CSU are engaged in the rapid growth phase with respect to our new OLE. Individuals and schools are using the new technologies and embracing the opportunity to establish themselves in the area of online learning. In reality, many of those embracing the new OLE Interact have already been pushing the boundaries of technology by using any available software. Out of necessity, in the absence of CSU supported technology many have adopted freeware (iTunes, iLecture, Pebblepad) or have purchased their own software (e.g. Survey Monkey). Still others have developed their own solutions to integrate with CSU systems such as subject websites and podcasting (Chan, Lee, & McLoughlin, 2006). While this innovation solves the immediate problems of individuals, and also serves to lead the way for others, it is unsustainable in the long term and at the scale of CSU institutional operations and does not lead to the stable institutionalised phase for the entire system. However, by listening to these early adopters and innovators and using their exemplars CSU has been able to begin to mainstream the innovative and new ways of doing things through professional development, a number of collaborative *Interact* project sites for sharing practice, and through the 2008 CSU Ed Conference.

Those who have seen the value of the new technology are exploiting the available resources. For example, CELT has a team of some 20 educational designers who support schools on all campuses but are resourced primarily for DE learning resource development. Within CELT itself, while all educational designers have been tasked with upgrading their own skills so as to be able to support their school staff in the use of *CSU Interact*, some have embraced the change more quickly than others and are becoming specialists in certain areas. Faculties that have recognised the value of educational designers have sought to fund their own educational designer to support educational development more widely. This enables the faculty to support the redesign of other courses for blended and flexible delivery. Some of the opportunists in this exploitation phase are those academics who have taken up the chance to become teaching fellows, funded through the new Institute for Flexible Learning.

In returning to the stable institutionalisation (conservation) phase, the loose relationships and connections characteristic of the rapid growth phase start to cement. Processes and procedures become more defined and people begin to settle into the new ways of doing things.

At the organisational level CSU could be described as being in the early institutionalisation phase with respect to its adoption of a new LMS and establishment of a new online learning environment. However, as described above, individuals and groups move through the phases of the Adaptive Cycle Framework at different speeds. Parts of CSU are now entering the institutionalisation phase. At CSU this is being seen in the support for *Interact* from CELT and DIT whereby training and professional development for *Interact* is being mainstreamed into university professional development programmes such as Foundations of University Learning and Teaching (FULT) and Tertiary Teaching colloquium (TTC). Innovation and new practice are mainstreamed through opportunities to share practice. The evaluation of the use of *CSU Interact* in individual subjects has been mainstreamed into the Online Evaluation Survey

system whereby subject coordinators can select *Interact* specific questions in customising their online surveys to obtain targeted feedback on their teaching. Policy requirements associated with the new approaches to teaching are starting to be addressed.

Conclusion

This paper is just the beginning of applying the theory of adaptive cycles to an educational technology context and the case study will be followed over the next couple of years. By presenting what is probably a fairly typical institutional case study the intention at this stage of the research is to challenge educators and managers to use a different lens to examine the process of change.

So, where are *you* now in the educational technology landscape? In an ever changing educational technology landscape the Adaptive Cycle Framework is a tool for survival. It provides a way of understanding where one is at with respect to technology or other aspects of the educational environment. At an institutional level the framework can be applied to assessing where the institution or parts of the institution are with respect to the timing of the introduction of new technology. It could be used to predict or assess the success of the implementation of say, a new LMS, or for evaluating the current use of technology towards making decisions around future support and future technologies. It provides a reality check for the institution in that change takes time and will be absorbed at different speeds in different parts of the institution.

For both the individual and the institution the cyclical nature of the framework helps to make some sense of the constantly changing educational environment. Similarly, application of the framework can alert one to being in the comfortable state of the conservation phase and the necessity to be continually assessing the external environment for those warning signs that signal changes that might affect the current situation in whatever phase of the cycle one happens to be in. Following major, or even minor changes to the educational technology environment, during the chaotic release state an awareness of the adaptive cycle provides reassurance that the perceived chaos can be an important part of the cycle of renewal. Change leads into potential reorganisation with opportunity for innovation and renewal. Those early adopters and innovators thrive in this phase. The key to good management of the educational technology environment is to ensure that this innovation and reorganisation can be harnessed and leads to rapid growth and movement towards a new stable, institutionalised phase of the system, better adapted and more resilient to external influences.

While useful as a tool on its own, the Adaptive Cycle Framework is just part of a social-ecological systems analysis that provides a way of understanding the bigger landscape of the educational technology environment (Buchan, 2008b). The situated nature of the learning environment within an organisation (Figure 1) illustrates some of the complexities in our broader education environment.

This conference provides a unique opportunity to capture a snapshot in time of where we are collectively in the educational technology landscape. Educational technology is a fundamental part of the learning environment and the challenge will be for each of us to now examine our own learning environment to find that path forward in using technology wisely to enhance student learning.

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