

LMS Governance Project Report

Report for the
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Lisa Wise
James Quealy

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Table of contents

Foreword	4
Executive Summary	5
Introduction	6
LMS Governance Project objectives	6
Theoretical perspectives	7
Opportunities for innovation and change	8
Project methodology	9
Section 1: Governance Report	10
The LMS ‘system’	11
Review of current LMS governance practices	13
Good governance practice for university LMS	22
Section 2: Future Directions	43
LMS governance: an organisational analysis	44
Recommendations for elearning sustainability	45
Reviewing the business case for LMS	47
elearning research: theory and practice	54
Elearning 2.0	61
Transformational pedagogy, organisational language and the capacity for change	65
Regenerative change	68
Business models for university management	69
References	72
Appendix 1: Project management heuristics	74
Appendix 2: Student engagement and LMS	77
Appendix 3: Annotated Bibliography	80

Foreword

This report represents our best effort to provide a review of current LMS governance with some usable recommendations (which was the primary focus of the project brief) while at the same time presenting an alternative viewpoint in which the potential of “Elearning 2.0” would obviate the need for a central LMS as the main focus of an elearning strategy. The tension between the need to address LMS Governance and our own view that the educational significance of LMS is largely overemphasised and misunderstood is evident throughout the report.

We were also very mindful of the number of internal and external reviews of LMS and educational technology (not all of which were made available to us) and the lack of impact these reports appear to have had in decision-making. We did not wish to go over ground already covered in these reports and we specifically avoided addressing individual accountability for any decisions or outcomes.

We felt that there were some interesting ethical issues involved in speaking formally with many of the people directly involved in current LMS implementation or governance process, especially given the state of flux of Information Division at the University of Melbourne and of CELTS at Monash University. We did not want to encourage the perception that we would resolve grievances nor did we want to interfere with the change management processes in effect for the duration of our project.

Our study showed how absolutely essential it is for a university to understand itself – what it values, what it does well and how it does it, what it would like to do, and how it might do this. This understanding of the organisation must be an ongoing part of the organisation’s life. The insights will be as diverse as the many contexts within the university, but these must be reflected back and built on through the discourse that is the core of the university’s way of being. If, as seems to be the case with educational technology, the university displays a persistent amnesia and an inability to evaluate or decide, punctuated by a series of projects, reviews and restructures that extend the amnesia, then we have a problem. A problem that must be made visible, so that it can be discussed and worked through, so that the skills and professionalism of the people that make up the university can be applied to the ongoing series of solutions, experiments and evaluations that will keep educational technology supporting new applications of the university’s work. As it has always done, the university must adapt, using technologies and models of understanding, in this case to reconcile teaching, research, IT, a changing environment, financial accountability and managerial models.

To get better outcomes, the university has to talk and discuss more, not less, be more open, not less, admit ambiguity and uncertainty, while addressing change and moving core technologies into the support of the academic enterprise. Efficiency does not result from short cuts, from denial of academic process and tradition, nor will it be delivered through over-controlling the boundaries of the university community – a community that has always spilt across institutional domains. A collegial approach to governing in the complex university environment can promote a balance between efficiency and creativity. University governance must reflect an understanding that this balance is the key to the university.

Lisa Wise
James Quealy

Executive Summary

Learning Management Systems (LMS) combine a number of IT-based course management and pedagogical tools to allow the design, construction and delivery of online learning environments to support a university's teaching and learning programs. As IT systems they are somewhat immature and their implementation can involve a level of complexity when they are linked as part of a suite of enterprise IT systems. As such they are not unique, but there is a perception seemingly borne-out by experience that their management and governance is especially problematic. In many universities the elearning enterprise for which the LMS has now taken centre-stage seems characterised by uncertainty especially in its role as a focal point for organisational change.

Key findings of the review of university LMS that informs this report include: lack of clarity about LMS and the elearning enterprise; lack of organisational knowledge about current teaching practice and its intersection with elearning; and a number of process issues. We propose a series of recommendations (pages 25-36 and 39-42) related to good governance practice including the need to:

1. Understand the nature of enterprise IT systems, and the model being followed for LMS adoption (ie. top-down or bottom-up);
2. Follow standard IT governance ie. treat the LMS as a commodity IT system and manage it accordingly;
3. Follow project management methodology;
4. Communicate openly through formal and informal channels;
5. Align decision-making responsibility with appropriately-resourced accountability;
6. Understand user impact;
7. Move non-LMS decisions to the academic, technical or administrative domain to which they belong.

Given that these principles of good practice are relatively straightforward known, we investigate why they haven't been followed. We consider the failure to develop a business case for LMS at Melbourne and Monash. We also investigate educational technology research and its apparent failure to effectively influence decision makers dealing with LMS. In both these areas we recognise the tensions arising from the organisational-change expectations around the LMS, and the lack of mechanisms to effectively capture organisational learning and feed it into an informed debate influencing policy and practice.

We conclude by considering the new challenges and opportunities provided by Web 2.0 technologies and how these might support an Elearning 2.0 model. This re-conceptualisation of elearning supports a move from a content focus (evident in organisational understandings of current LMS) to approaches that see the social and interactional nature of teaching as essential. We propose a further series of recommendations (pages 45-46) to ensure that the universities will be ready to evaluate and successfully integrate these new technologies with less disruption and organisational cost than was the case for LMS.

Introduction

It is claimed that Learning Management Systems (LMS) will have profound effects upon the core educational and business activities of a university, but they are a comparatively new medium for which mature administrative support and resourcing strategies at the enterprise level are still being developed. In order to ensure good LMS governance, there must be clarity of purpose regarding the role of a central LMS in the teaching and learning framework of the university, and an understanding of both the potential and limitations of technology-mediated teaching and learning in the online environment.

The governance challenge is to manage: the achievement of educational benefit; staff development; student support; funding strategies; implementation of technology; and research into emerging pedagogies; that is, to create the structures, protocols and communication channels for systematic planning and decision-making about online teaching and learning on a university-wide basis.

In this report we discuss the similar but diverse experiences of Melbourne and Monash Universities as the basis for a systematic review of central LMS governance. Although our focus is on the LMS, its intersection with a range of other enterprise-wide and local IT systems means our project necessarily explored broader governance issues relating to ICT infrastructure and support. LMS also impinge on broader issues relating to pedagogy in university teaching.

LMS Governance Project objectives

The project objectives are:

- (1) To better align the policy, procedures and governance structures involving the LMS with institutional strategic directions on teaching and learning.
- (2) To develop a community of practice to enable the sharing of experiences, ideas and resources relating to migration, implementation and governance.
- (3) To provide a theoretical basis and a coherent research framework for the ongoing use of an LMS and to generate transferable governance models and processes in order to demonstrate organisational value.

To achieve these objectives we will:

- review the governance practices around LMS at Melbourne and Monash
- examine of the role of LMS in building an online environment to support teaching and learning;
- consider definitions of ‘community of practice’ based around organisational conversation and creating opportunities for dialogue across organisational boundaries;
- use the concept of learning organisations as adaptive cybernetic networks for regenerative organisational change to develop a theoretical framework for understanding the governance of online learning environments.

Theoretical perspectives

In addressing the project objectives the following themes capture the key theoretical perspectives we will use to frame our analysis.

LMS and contested domains

There seems to be widespread consensus that a central enterprise-level LMS is essential for a quality university. According to Coates, James and Baldwin (2005) “... *there is something so seductive about LMS that, despite their complexities and risks, almost every university seems compelled to have one.*” There seems also to be widespread support for the claim that a central LMS will be an agent of change. Whether such change is viewed positively or negatively seems more informed by theoretical and dispositional bias than empirical evidence. Indeed, as we argued in our submission to the University of Melbourne *Growing Esteem* process, much concerning the adoption of an LMS is in a contested domain. It sits at a fault line within the University between many competing conceptions of the University’s mission and management. It can be seen for example as being positioned between traditional academic and educational-design driven teaching; between collegial approaches to academic governance and managerial models of university business; between flexible ad-hoc local IT systems and purportedly efficient enterprise-wide systems; between notions of intellectual freedom and imperatives for the commercial management of intellectual property; even between so-called “digital native” students and “digital immigrant” teachers – in short, between the traditional and the new.

Traditional online learning versus Elearning 2.0

There is another contested domain even more fundamental to the consideration of the LMS, that of “traditional” educational technology versus “new” online learning (“Elearning 2.0”). Although this contested area raises fundamental pedagogical questions, the debate is marginalised by the technological scope of the domain. Until there is more widespread understanding of the online world as an interactive environment rather than a very large multimedia content repository, the substance of the debate will be difficult for “digital immigrant” managers to evaluate. There is such a difference in perspective between traditional educational technology (where you consume content while chained to your computer) and ‘ubiquitous computing’ (where your computing devices merge effortlessly into your active life); between Web (the place you go to get things) and Web 2.0 (the place you go to do things); between LMS (controlled, structured delivery) and Elearning 2.0 (free discovery, interaction, creativity and sharing); that although we use the same words, we are talking about entirely different concepts.

Organisational learning through regenerative change

Later in this report, we will contrast the “traditional approach” to educational technology and online learning, with frameworks for understanding new online technologies, and then present an outline of where learning with technology is heading. That direction, we will argue, is not one in which a central LMS will feature prominently (at least not in a need-for-governance sense), making “LMS governance” an issue with increasingly diminishing impact. However conversations about online learning will have increasing importance as use of a diverse range of interactive online tools becomes more mainstream. Conversations will increasingly revolve around communities of practice, social networks and the role of Web 2.0 tools for facilitating and promoting such things. Diverse, overlapping communities of practice create shared languages

of discourse through natural evolution, helping to clarify where we have come from and where we are heading. Only with shared language can we begin to build innovative approaches to research-led teaching and learning practice in an online environment.

Opportunities for innovation and change

At the **University of Melbourne**, there is a clear window of opportunity for innovation and change in online learning around the preparation of the new curriculum under the Bologna Model. The cross-disciplinary broader focus of the new undergraduate program, the more extensive use of team teaching to small groups within large cohorts and to the entire cohort itself, and the potential to build individualised discipline themes within cross-disciplinary frameworks will severely challenge the capabilities of current LMS products. Support for longitudinal personalised collation of learning resources leading students towards their individual specialised post-graduate studies will need to be considered. The catch-all “ePortfolio” concept deserves further consideration as does the need for it to be portable, configurable and individualised.

At **Monash University**, the central LMS service already forms part of an integrated online environment delivering course material, email, calendar and other services through the single-entry-point MyMonash portal. There are clear opportunities for integration of Elearning 2.0 tools into this environment and to build an innovative Eresearch environment using some of the same components.

Broader innovative opportunities exist in terms of the possibility of partnering with popular Web 2.0 service providers (eg Yahoo, Google, MySpace, Flickr) for interactive web services in the same way as universities currently provide academic versions of popular software. Instead of having to log in to a range of online services depending whether it is for personal use, work use, or for study, a student could login to their service of choice for each functionality, and link the service back to their university course or other activity. Online access to the university through partner service providers could act as a ‘virtual gateway’ to the university. This would be the online equivalent of coming on to the physical campus.

With a similar aim of extending the “virtual campus” metaphor, it may be possible to partner with local cafes, bookstores and the like to provide free university wireless internet services to staff and students through their outlets. This inverts the “learning hub” concept from that of creating relaxed coffee lounge environments in university libraries to creating university libraries in the local cafe. The essential feature of the Web 2.0 online experience is that you can interact with the university online environment rather than just download content, thereby creating a ‘virtual campus presence’ of substance. The possibilities of building online communities where Melbourne and Monash have their own unique presence but also link with other communities in the same space only touch the surface of the opportunities to create active online social and informal learning networks built around university communities.

Project methodology

Our methodology for the report was informed by the need to provide a reasoned analysis of the issues of LMS governance and the essential nature of LMS in a University setting, and to do so in a way that delivered useful insights that might form a basis for further discussion and possible action. In order to do this we drew on our experience of planning, implementing, running and servicing LMS, both centrally and at a Faculty level at three Universities.

We conducted many structured conversations with a range of stakeholders in University LMS and held many more informal conversations with those directly involved in: implementing LMS; running LMS services; supporting LMS; educational support; faculty administrators and university management. We had access to many (but not all) internal reports from Melbourne and Monash on the LMS and had access to a selection of committee minutes and project plans and reports. We aimed for a representative rather than complete set of inputs from formal channels, focusing much of our attention on actual practices and where these differed from official expositions, we sought to understand why.

In order to provide a basis for a coherent research framework, we felt it was necessary to explore the theoretical and research background underlying the many contested areas around LMS. The annotated bibliography being constructed as part of a project website ([http://www.mdhsonline.unimelb.edu.au/mediawiki/index.php/Annotated Bibliography](http://www.mdhsonline.unimelb.edu.au/mediawiki/index.php/Annotated_Bibliography)) encapsulates the breadth of coverage in our literature review, and will provide the input for journal articles and conference presentations deriving from this project. It will also be used to seed discussion in communities of practice that may emerge from this project. The body of the report itself will not attempt to provide a detailed coverage of the literature, but will draw on ideas that have emerged from our understanding of broader governance, economic and pedagogical contexts.

Section 1: Governance Report

The LMS 'system'

Coates, James and Baldwin (2005) undertook a critical examination of the effects of LMS on university teaching and learning in Australia. We will use their definition of LMS to provide the scope for what might fall under the LMS governance umbrella.

“LMS grew from a range of multimedia and internet developments in the 1990s. In the last four years, the systems have matured and been adopted by many universities across the world. Also referred to as learning platforms, distributed learning systems, course management systems, content management systems, portals, and instructional management systems, they combine a range of course or subject management and pedagogical tools to provide a means of designing, building and delivering online learning environments. LMS are scalable systems which can be used to support an entire university’s teaching and learning programs.” Coates et al 2005

A University LMS viewed broadly consists of many components; the principle members, together with their relationships are shown in Figure 1 below.

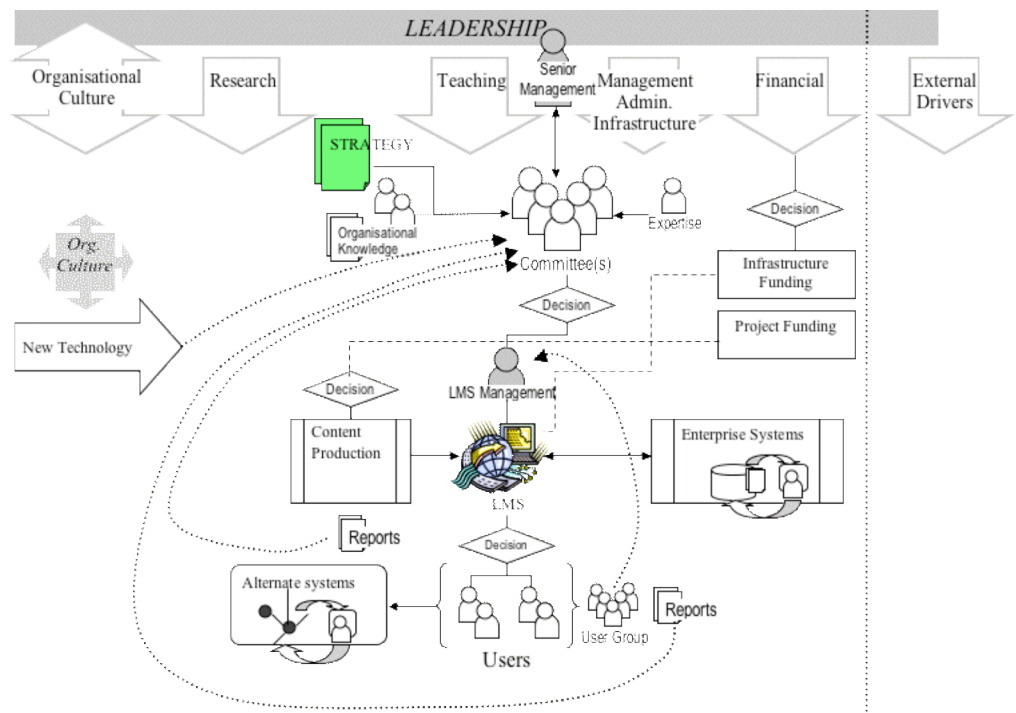


Figure 1: Generic University LMS system showing main components and relationships

The components can be thought of in terms of: IT systems including the LMS itself, other enterprise systems to which it may be linked, and alternate systems used by LMS users; Users including students, academics and administrators; Support services including helpdesks, educational designers and content makers; Governance-related bodies including committees and user groups; Documents including University strategic plans and IT plans, learning and teaching plans, project documents, standards documents, process documents and a variety of reports; There will also be a range of less concrete factors involved including University academic and business drivers, University

management practices, external drivers including legal and government frameworks, University culture and a diverse range of understandings and expectations about the LMS and elearning. For effective management of the LMS, all of these factors have to be in some sort of harmony. With the LMS typically overseen by a combination of traditional academic governance structures and IT management processes, good governance can seem difficult to achieve. The following section details the main components of governance, identifies accepted good practice and then looks at the LMS experience at Melbourne and Monash Universities and makes a number recommendations for improvement.

Review of current LMS governance practices

Overview of governance

Governance in a large organisation is irreducibly complex with many types of governance practice demonstrated. The most relevant categories of governance in the LMS domain are: corporate governance; IT project and service governance; and wider university governance.

Corporate governance is concerned with achieving a balance of the interests involved in an activity in order to achieve corporate aims. It seeks to provide the conditions and processes to ensure these aims can be achieved. It encompasses the alignment of corporate activities with strategic direction, the provision of reliable and salient information to frame executive action and to enable management and board decision-making and accountability.

Governance specifies the relationships between different corporate groups and individuals – board, managers, workers, suppliers, shareholders (stakeholders) customers, the community and regulators. It seeks to determine the rights and responsibilities of these groups. Its mechanisms allow accountability for assets and expenditure. It directs and authorises executive activities and so defines the organisation. Governance ensures the organisation is aligned towards aggregate mutual benefit. The governance activity provides the basis for ensuring the truth required for the organisation to function. An important dimension of governance involves enabling the information flow between stakeholders. Effective governance requires and contributes to corporate memory and knowledge.

Project governance as it is currently practiced derives from engineering via IT where it is the fundamental *modus operandi*. The focus of project and IT governance project is successful project delivery. In many cases (eg. RMIT's Student Management System failure in 2002) aligning the IT governance and the organisational governance has proven difficult – this has typically been resolved by the widespread adoption of IT-based project governance and its associated project management methodology across the organisation.

The following table provides a generic description of project governance. Key dimensions are:

- **Roles and responsibilities:** This includes the roles and clearly articulated responsibilities of project boards, project sponsors, service owners, steering and other committees, management, the project team and wider stakeholder groups. A key responsibility that must be clearly assigned is decision-making. Different roles will typically be responsible for different classes of decisions, with the ultimate decision to proceed or not with the project an essential guarantor of the rigor of the governance.
- **Process:** Key processes include project management, reporting protocols, approvals and risk management. The method for dealing with issues is another key process.
- **Scope:** Scope is managed so that the original project intents captured within the project charter can be achieved within the available time and budget.

- **Information and communication:** This provides the basis for organisational knowledge about projects, their aims and status and is a key dimension of ensuring appropriate involvement of stakeholders throughout the project.
- **Definitions:** Broadly these include not just the common language captured in the glossary of terms, but also definitions of the project, its aims, its time and budget constraints, as well as the definition of project risks and dependencies.

Table 1. Key dimensions of good project governance

Principles of Good Project Governance	Roles / Relationships	Process	Scope	Information / communication	Definitions
1. Outline the relationships between all internal and external groups involved in the project.	X				
2. Describe the proper flow of information regarding the project to all stakeholders.		X		X	X
3. Ensure the appropriate review of issues encountered within each project.	X	X	X	X	X
4. Ensure that required approvals and direction for the project is obtained at each appropriate stage of the project.	X	X			
Specific elements include:					
5. A compelling business case, stating the objects of the project and specifying the in-scope and out-of-scope aspects.		X	X		X
6. A mechanism to assess the compliance of the completed project to its original objectives.		X	X		
7. The identification of all stakeholders with an interest in the project.	X				
8. A defined method of communication to each stakeholder.				X	X
9. A set of business-level requirements as agreed by all stakeholders.				X	X
10. An agreed specification for the project deliverables.			X		X
11. The appointment of a project manager.	X				
12. Clear assignment of project roles and responsibilities.	X				
13. A current, published project plan that spans all project stages from project initiation through development to the transition to operations.		X		X	X
14. A system of accurate upward status- and progress-reporting including time records.		X		X	
15. A central document repository for the project.				X	X

Principles of Good Project Governance	Roles / Relationships	Process	Scope	Information / communication	Definitions
16. A centrally-held glossary of project terms.				X	X
17. A process for the management and resolution of issues that arise during the project.		X	X		
18. A process for the recording and communication of risks identified during the project.	X	X		X	X
19. A standard for quality review of the key governance documents and of the project deliverables.				X	X
<i>Source – Wikipedia last accessed 13/05/06</i>					

Project governance should clearly and definitively change to those appropriate for service governance once the project (eg. LMS implementation) is completed. An LMS will cycle through maintenance and upgrade projects whilst maintaining service delivery. The core aspects of service governance are well understood within IT areas, but attention must be paid to ensure both the service and its governance are aligned with organisational expectations and other non-IT governance processes. Service governance should ensure accountable management and facilitate it, through clarity of expectation, resourcing, support and endorsement.

It is obvious that governance for both projects and services is interdependent on management. Governance does not mandate particular management methods, other than those relating directly to agreed project management methodology, reporting and the delivery of either the defined project or the provision of a service meeting defined standards.

“Best Practice” and models of LMS governance

University governance can be increasingly seen as operating within the corporate governance space, with Government policy (*Our Universities: Backing Australia’s Future*) identifying an expectation that universities needed to run in a more “business-like fashion” to support sound decision making and accountability (Coaldrake et al, 2003) with much of the discussion on university governance being around the complexity of the university environment and the need to resolve the tension between innovation and efficiency. An expectation of this project was that we would conduct a survey of LMS-related governance and management practices at a range of universities, which would inform a ‘best-practice’ template for LMS governance. However, there are a number of problems with this approach in both theory and practice.

Best practice

‘Best practice’ as a concept originates from the scientific management perspective of management articulated in the work of Taylor and Munsterberg (see Haslam, 2004). This approach assumes that efficiency is the most desirable aspect of work practice, and that there is ultimately a single “best possible

man”, “*best possible work*” and “*best possible effect*” towards which we should all strive. Best practice, even in domains where it could meaningfully be identified and applied, has a different aetiology from innovative practice and is in fact largely inimical to it as discussed elsewhere in this report. Best practice for LMS governance assumes that a single underlying model of LMS governance could capture the entire domain of LMS and we did not find this to be a readily supportable contention.

Benchmarking

A comprehensive survey of LMS practice is essentially a ‘benchmarking’ process against a detailed set of objective criteria. Applying ‘benchmarking’ to identify best practice in the area of learning, learning management and learning management system governance is an unavoidably superficial approach given:

- the disjunction between the official formal structures and decision-making processes within universities and the actual academic and business practices;
- cultural differences between institutions;
- complex multi-factorial nature of the academic space;
- differences between universities in terms of both their formal and implicit agendas and objectives with respect to LMS;
- the fact that the real workings within the LMS space along with identified blockages and failures would require access to largely confidential data and a micro-analysis which would inevitably be flawed by being decontextualised.

A model deriving from decontextualised, sanitised data would be of limited use for adoption within a different culture in a different organisation with a different mix of drivers.

Models of LMS governance

We chose a different approach informed by our detailed ‘insider’ knowledge of three universities, our formal and informal conversations with a broad spectrum of people involved in elearning, our reading of the online and traditional literature, and information gleaned from university websites in Australia and overseas. We identify four potential models for LMS adoption and management and governance:

- 1)** Adopt a system, **mandate the terms of its use**, clearly communicate expectations and responsibilities, and support participation to the degree mandated;
- 2)** Adopt a system, **allow it to be used where it is seen to add value**, then support that use;
- 3)** Identify diverse needs and **implement tools to support established needs** to the extent that a business case can be articulated;
- 4)** Embrace LMS learning environments that emerge from central or localised solutions to specific needs, **integrate any potential online learning tools that emerge ‘in the wild’**, support online learning tools to the extent warranted by their perceived importance and use.

The first three models are essentially *top-down command-and-control models*, but with increasing degrees of flexibility built into the possible mandated interactions. The LMS is still situated in the IT context, viewed and managed as an inherently rule-based ordered enterprise IT system. Once the choice has

been made to engage with the LMS, mandated IT processes will be in place to manage that engagement.

The fourth LMS governance model begins to take account of *bottom up processes* in which central LMS services are based on what emerges “in the wild” (both within the university and outside it). The development and implementation of these wild-type systems can be handled by any number of processes, but it is the fact of their emergence and the nature of their subsequent use which drives the configuration of centrally offered services and thus moves the governance into the unordered, ambiguous realm of social complexity.

Managing complex systems

The ‘*command-and-control*’ approach implicit in project management methodology is the form of governance dominating the IT domain. Software engineering methodology assumes that total control over input, output and interactions are possible, at least in theory, for the software development process. Other than at the human interface, software systems are inherently ordered and rule-based. Academic governance models are generally more flexible and ‘organic’ to accommodate the fact that they cannot avoid dealing with complexity of human interaction. The key to LMS governance is to place the LMS in the appropriate frame of reference within the organisational structure based on its primary objective(s). In order to shed light on the alignment issues arising from different governance cultures, it may be useful to refer to Snowden’s multiple-ontology taxonomy pictured below and discussed in further detail elsewhere in the report.

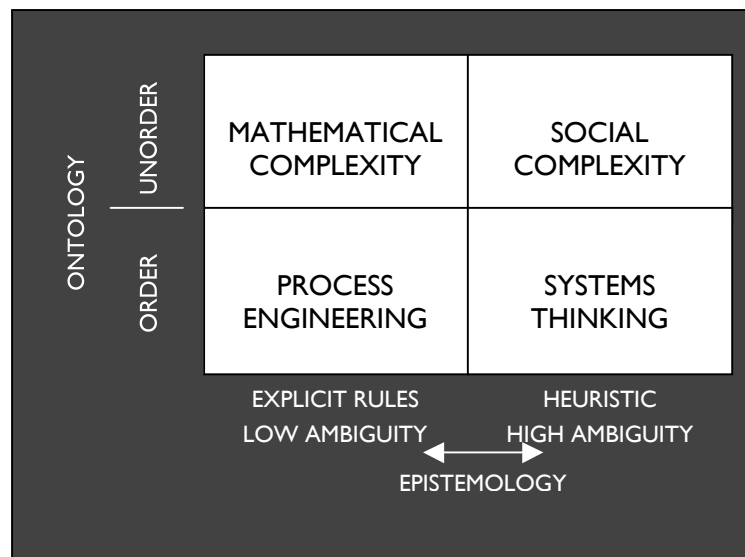


Figure 2. Multiple-ontology taxonomy. From Snowden (2005).

Best practice, efficient, process-oriented command-and-control management fits in the lower left quadrant and is characterised by order systems and explicit rule sets. In contrast, organic, flexible governance is based around more ambiguous, heuristic rule sets that emerge to deal with social systems, which are inherently disordered and ambiguous. Simple LMS fits relatively cleanly into the lower left process engineering quadrant of this model and would be appropriately governed by process-oriented management. As LMS move towards integrated enterprise IT systems, the need to address organisational complexity arises through the need for data mapping between enterprise systems with different

organisational views. Enterprise LMS begin to move towards the lower right 'System Thinking' quadrant of Snowden's model. Although enterprise LMS systems deal with complex rulebases, they are still within the inherently ordered ontological space.

However, LMS governance, when viewed more broadly as the alignment of online technology with teaching practice, starts to move towards the upper right 'Social Complexity' quadrant where the underlying system is essentially unordered. Whether or not LMS governance has to deal with ordered systems level complexity or unordered social complexity rests with the question of whether technology *drives* or *serves* teaching practice. The vast majority of universities have *IT Services* divisions which deliver IT infrastructure as *services* to support the core business of the university (research and teaching). Most universities have adopted central enterprise models of LMS service and it would seem that normal process-oriented IT governance processes should apply to the LMS according to the IT Services area designated to manage it. Academic governance processes (which are located in the 'Social Complexity' quadrant) would deal with alignment between technology and teaching practice.

Examples of LMS governance practice

From our broad survey of LMS governance practice, we have selected a small number of specific examples to illustrate the governance options described above.

Medical faculty LMS at Melbourne.

The LMS (TopClass) implemented in the medical faculty at Melbourne is a governance model which falls into Snowden's lower left 'Process Engineering' quadrant. The decision to implement an LMS was made by the Faculty Education Unit (FEU) on pedagogical grounds. The FEU was responsible and accountable for delivery of the new PBL-based medical curriculum and was thus the appropriate area to "own" the LMS decision. The system was then implemented by the Faculty IT Unit working closely with the system "owners", but treating the LMS as an IT project driven by the FEU as academic owners. The 'command and control' management model which mandated the type and extent of use of the LMS was appropriate for the objectives of the system and its fit with:

- the pedagogical needs, represented by the new PBL curriculum;
- the profile of the teaching staff, many of whom are primarily medical practitioners rather than academics;
- and the capacity of the Faculty to provide an appropriate support model, which sees the teaching staff supported to the extent that they don't need direct interaction with the system's administrative functions.

The governance for this system can be characterised as:

- local;
- accountable;
- sustainable;
- having direct control over the implementation, cost and support of the system.

RMIT IT Alignment model

The RMIT IT Alignment Program (1998 – 2002) corresponded to a 'Systems Thinking' approach (lower right quadrant) in which the LMS was part of a

comprehensive suite of connected IT systems designed to model and support the operations of the university. Implementation of this IT model was expected to facilitate institutional change by meeting expected student demand for flexibility, dealing with financial constraints and embracing international market possibilities. The level of LMS adoption mandated was negotiated at a faculty level. Core support for basic functions was provided centrally and additional support was funded and managed at the faculty level in line with faculty-level mandated use. There were considerable tensions in the alignment process through which the central ‘Process Engineering’ perspective at the IT systems level had to interface with the strongly diverse pedagogy in academic areas. As a result of mismatched models of LMS between IT areas and socially complex faculties, LMS governance was somewhat fraught. Within particular faculties, however, the inevitable ambiguity was managed with greater or lesser success. The Business Faculty adopted a model of high-support and limited expectation that was in many ways analogous to the Melbourne Medical Faculty approach described above. While this worked well locally, the theoretical linkage to the University strategic LMS goals was premised on the implicit model proffered by the LMS vendors that basic, essentially administrative usage of the LMS would somehow evolve into more ‘sophisticated’ pedagogical and learning design approaches. As the 2004 ATN Online Learning survey (Platts, 2004) shows, this did not happen.

Expectations of emergent transformation of teaching practice through LMS adoption were one factor in RMIT’s substantial organisational restructures around Learning and Teaching. When governance models are placed within Snowden’s theoretical framework, an explanation for the failure of pedagogically-sophisticated LMS usage to emerge through evolution can be proposed. The evolutionary model for transformation of teaching practice involves incremental incorporation of basic LMS tools to teaching practice. This simplistic additive approach rests on the belief that simple inherently ordered elements can aggregate hierarchically through a multiplicity of simple inherently ordered processes to create systems with emergent complexity: ie. there is a continuum from rule-based simplicity to heuristic complexity. In Snowden’s model, another dimension, that of order and unorder differentiate the inherent nature of complexity. In this model, the difference between simplicity and complexity of a truly transformational nature would need to cross the order-unorder boundary and thus is qualitative not quantitative. It is worth noting that the wider aims of the IT Alignment Program initiative were not met when:

- 1) the new markets failed to materialise;
- 2) costs were increased rather than reduced;
- 3) the mismatch of IT and university governance led to loss of control and ineffective risk management;
- 4) the underestimation of social complexity led to failure of the business process engineering related to student administration and the consequent failure of the student management system.

WebRaft at Melbourne

WebRaft, Melbourne University’s homegrown LMS is an example of an organic governance model closer to the upper right quadrant of ‘Social Complexity’ in Snowden’s model. As a self-governing system, it was cost-efficient, responsive to users and effective in supporting its user needs. However by operating on a modest budget largely “under the radar” of enterprise IT management, it made itself effectively invisible to senior

management. It suffered through both explicit and implicit comparisons with Melbourne's prestigious self-image in which it expected to meet complex and poorly understood technology needs through high profile, "world's best practice" flagship solutions. The low-budget, home-grown, utilitarian interface to WebRaft was perceived to impact negatively on the university's "brand". The over-optimising nature of central IT decision-making at Melbourne was exacerbated by a naive belief that a central 'best-practice' LMS model could fit all the diverse needs in multiple teaching domains while simultaneously encouraging innovation and creativity. The decision to replace WebRaft with a purportedly more 'scalable' vendor system rather than to upgrade the WebRaft interface was made without apparent reference to any detailed technical, pedagogical, user-centric or usability-based evaluations of WebRaft and its usage. Thus the major governance problem for WebRaft occurred largely within the IT governance domain in as much as it was misunderstood by IT management with the concomitant negative effect on perceptions of it held by academic managers. There was a serious mismatch between the largely effective "just-in-time" governance model which evolved informally with users of the service versus the "best practice" management view of how formal IT governance should be handled.

This sort of misapplication of governance styles was apparent in other institutions, where "under the radar" services based on carefully crafted semi-formal networks also operated very effectively. These networks came to the attention of management more often than not as a result of modest budget requests to increase the breadth of an otherwise effective, low cost service. Ironically, the application for funding often generated a process by which such services became formalised in order to improve the perceived quality, efficiency and professionalism of the service from the management perspective, and this often destroyed the very informality that was the essence of their successful operation. Meanwhile, many universities are now looking to initiate "communities of practice" from above without appearing to understand the essential informality and complexity of interactions which are inherent in social governed systems.

Monash Portal and LMS

Monash appears to have identified an appropriate organisational level for the LMS and other online services and offers a reasonably balanced level of centralised versus local support and governance. They have essentially removed the expectations generated by pedagogical discourse from a place of central control (the former Centre for Learning and Teaching Support) to a more localised faculty or departmental level, thereby identifying the central LMS service as primarily an IT infrastructure service rather than an agent of pedagogical change. The central authorised LMS system is by and large an opt-in system but other niche systems, central or faculty, can be integrated seamlessly into the online learning environment through the MyMonash portal. IT Services manages interactions at the boundaries of online learning systems through standard IT governance processes for enterprise software and other IT and communication systems (eg authentication, network access, data exchange etc), but does not interfere in the internal (pedagogical) use of the LMS. Each faculty is free to develop their own academic support structures, with a range of effective models in place to suit the different cultures and budgets in different areas of the university. Faculties can also support their own "in-house" systems but manage student access to these systems via the Portal. IT command-and-control management approaches are applied to IT systems, and more complex governance processes outside of ITS are applied to academic systems. The LMS

and other learning technology are governed as a standard part of the IT infrastructure rather than being endowed with intrinsic pedagogical features which require complex interaction between academic and technical governance processes.

LMS practices at other universities

There is an extensive case-based literature on LMS implementations at a range of universities, some of which is referenced in the bibliography attached to this report. The common features of successful implementations were realistic operationalised objectives, defined project scope, and appropriate organisational support.

Summary of LMS governance principles

These are a set of high-level principles that we will apply to our following analysis of the experience at Melbourne and Monash.

- 1) Learning Management Systems are really Course Management Systems, but it is too late to change the terminology because the term CMS is now firmly entrenched as the acronym for Content Management Systems.
 - **“Learning” is not governed through LMS.**
- 2) Learning is the outcome of teaching, and teaching practice is governed through a complex maze of academic governance channels outside the scope of this project.
 - **“Teaching” is supported, not governed through the LMS.**
- 3) **LMS governance models should match the IT governance models already in place for other IT services.**
 - Standard IT governance processes should be in place to handle project management, service management, matrix management issues, account management, authentication, data-sharing between applications, business continuity processes, disaster recovery, security, critical incident management.
- 4) As the systems and their use matures, **much of the functionality of the LMS will come to be regarded as a commodity service** requiring effective, responsive management rather than any great level of specific governance.
 - The focus of the governance activities will be on strategic direction and matters such as high-level evaluation of effectiveness, needs, and possibilities, costs and sustainability and system integration and user engagement.
- 5) **Good communication channels are an essential platform for good governance.**
 - Informal communication networks should be understood for what they are and nurtured accordingly – they are inherently informal and are shepherded rather than commanded.
 - Formal communication channels should be established where required and should be used for all formal communications.
- 6) The **choice of command-and-control versus bottom-up adaptive governance processes** will depend on whether LMS is seen as an enterprise software system (command-and-control) or also embraces the broader online learning environments envisaged under the umbrella of Elearning 2.0 (bottom-up adaptive).

Good governance practice for university LMS

Coaldrake et al. (2003) map high-level university governance in the Australian context against the recent guidelines and standards for corporate governance produced by the Australian Stock Exchange (2003) (ASX Governance Principles) and Standards Australia (2003) (AS 8000). Good corporate governance involves establishing a system that implements the following ten principles:

1. Lay solid foundations for management and oversight
2. Structure the board to add value
3. Promote ethical and responsible decision making
4. Safeguard integrity in financial reporting
5. Make timely and balanced disclosure
6. Respect the rights of shareholders
7. Recognise and manage risk
8. Encourage enhanced performance
9. Remunerate fairly and responsibly
10. Recognise the legitimate interests of stakeholders

These form a useful basis for teasing out specific issues related to LMS governance. The following table examines the experience of LMS Governance at the University of Melbourne and Monash University against these corporate good governance principles. It identifies issues particular to each universities LMS implementation and those applying to both and then produces a set of recommendations to enable these standards of good practice to be met. The recommendations cover both governance and the supporting project management requirements.

Table 2. LMS Governance and Corporate Governance Principles: Experience and Recommendations.

1. Lay solid foundations for management and oversight of LMS	
University of Melbourne	Monash University
<p>Implementation Phase Governance: LMS Implementation Committee formed in 2004 to oversee the pilot implementation of the Blackboard LMS in 2004 / 2005 for a full-scale production service in 2006.</p> <p>Key Project Roles:</p> <ul style="list-style-type: none"> • Project Sponsor: DVC Academic. • Project Owner: VP Information through the Director of TeLARS - who had line management responsibility as project director • Executive Director of LMS Project • Chair of Implementation Committee • Project Manager <p>Implementation Issues (pre Nov '05):</p> <ul style="list-style-type: none"> • It was not clear who was responsible for the project and project decisions. • If people, not committees are responsible for decisions, it is unclear whether this relates to specific individuals or roles, and if people or roles change, where does the responsibility reside? • Poor representation of academic users and no representation of faculty support staff (admin or technical). • Lack of communication to stakeholders. 	<p>Implementation Phase Governance: WebCT CE Implementation started July 2001 in production start 2002. (notes below refer to this initial implementation) WebCT Vista implemented in 2005.</p> <p>Key Project Roles:</p> <ul style="list-style-type: none"> • Project Executive Sponsor: DVC Academic who was responsible for high-level decisions. • Overall Project Manager: Special Advisor to DVC Academic (responsible for liaison and coordination between ITS and CeLTS, and providing options to the sponsor). • Project Management Implementation, ITS (who managed the implementation according to the project plan and Thomsett methodology) • Training and support project through CeLTS <p>Implementation Issues:</p> <ul style="list-style-type: none"> • ITS followed Thomsett project methodology within its project portfolio but had no authority outside of its division – problematic for cross-divisional projects; • Clear decision-making responsibility with project sponsor (Thomsett methodology) but Project Sponsor not engaged so Project Manager became de facto sponsor and ITS Project Manager (Tech lead for overall project) became de facto Project Manager; • Although CeLTS was a support area for teaching and learning, it was not an appropriate substitute for academic representation.

1. Lay solid foundations for management and oversight of LMS

Production Service Phase

Not yet in full production, but management is now by a Project Board chaired by AVC Academic.

Production Service Phase

LMS Governance Board has oversight of LMS.

LMS Reference Board (formal membership).

LMS Users group (broad self-selected membership).

Shared Issues:

- There was no sign-off on LMS Implementation project plans until well into the implementation phase so that both LMS projects began with unclear objectives which have never been properly clarified;
- There has been at Monash, and it is expected there may be at Melbourne, difficulty in transitioning the LMS from an IT project to an IT production service in terms of governance, staffing and ongoing funding;
- There have been matrix management issues inside IT Services division: particularly in terms of project / service versus line management issues and management issues across internal IT “silos”;
- There have been difficulties with the Project Offices residing within IT Services area. These Project Offices have no apparent authority outside of the IT divisions. Across the broader University in each case there is no shared understanding and acceptance of the official project management methodology;
- At both Universities, responsibility for the LMS within IT Services has changed hands through organisational restructure;
- The central service areas responsible for educational technology (UoM: TeLARS / Monash: CeLTS) have been so significantly restructured as to no longer exist, this being indicative of a widespread tendency to disrupt or obliterate organisational knowledge and learning;
- There is an unanswered question of whether the centralisation of LMS services is primarily to provide support for teaching and learning directions established in faculties, to provide leadership and set a direction for the use of educational technology, to manage a predefined service efficiently, or to audit the quality of teaching:
 - It is not clear where academic leadership with respect to educational technology should come from.
 - It is not clear whether academic or technical leadership is required.
 - It is not clear who should be responsible for prioritising functional requirements, especially where there are conflicting demands.
 - It is not clear who has the appropriate expertise to undertake a technical audit of the LMS service in the light of the prioritised functional requirements.
- There is a key unanswered question of whether innovation and change to teaching practice are required in order to maximise LMS use and whether such changes are academically and/or strategically desirable.

1. Lay solid foundations for management and oversight of LMS

- The question of whether use of the LMS and other ICTs should be mandated academically, administratively and/or technically remains unanswered.

1. Recommendations:

- 1.1. Establish clearly prioritised objectives for the LMS service.
- 1.2. Establish formal and informal communication channels and ensure they allow multi-directional flow of information.
- 1.3. Project Management processes should be complied with. In particular, project and service charters and communication plans should be widely available before project commencement.
- 1.4. There must be clarity of expectation about projects and services to guide managers and service providers.
- 1.5. Subject to meeting objectives and defined expectations, operational areas should be given freedom, resources, support and guidance from governing bodies and senior line management.
- 1.6. Governance bodies should encourage an environment of trust and responsibility (through adherence to their espoused processes and clarity of responsibility expressed transparently).
- 1.7. All LMS-related activities should encourage and deal with input from stakeholders at all stages. Issues, concerns and suggestions must be dealt with as they arise.
- 1.8. Many of the issues arising with the adoption of an LMS are not related directly to the LMS system. These should be dealt with in the academic, administrative and managerial contexts where they properly belong.

2. Structure the governing bodies to add value

Note:

There is a need here to determine the role of the many governance-related bodies that have some role in the overall project or service governance of the LMS (see the following section on committees). All of these bodies from LMS Project Boards to LMS User Groups should however add value to their task and be part of a coherent governance system.

Shared Issues:

It is hard to determine value when there is no clear strategic direction for LMS. There are many unanswered questions:

- Who sets strategic direction for LMS?
- Who (at an individual and group level) has LMS-specific technical or pedagogic expertise?

2. Structure the governing bodies to add value

- How should academic representation be managed?
- How should the needs of support staff be represented?
- How should the needs of administration staff be represented?
- How should the needs of students be represented?
- LMS Governance boards sit outside of the IT Services area but services are managed within IT Services.
- Issues related to the operation of LMS Governance boards, include:
 - What is the board's authority – is it advisory or decision-making?
 - Who do they represent and in what capacity?
 - How is extra expertise engaged if required?
 - What are the formal input channels to board?
 - To whom do they report (are decisions of the board to be noted or action plans endorsed)?
 - Who controls the agenda?

2. Recommendations

- 2.1. Clearly define whether a particular governance body is primarily an advisory or decision-making entity. Develop its terms of reference and membership accordingly.**
- 2.2. All governance bodies should have clearly defined and public terms of reference. The linkages through to other committees and decision makers must be clearly and explicitly identified. These terms of reference should be reviewed annually.**
- 2.3. Membership of all governance bodies should involve clearly defined roles and responsibilities. Expectations of members should be made explicit and be formally agreed to.**
- 2.4. Training, mentoring and support should be made available to ensure that members have the necessary procedural, technical, subject-matter and communication skills.**
- 2.5. A balance of experience, enthusiasm and expertise is required in members within the broader governance framework. The importance of selecting and developing the right people for governance roles must be recognised by all stakeholders.**
- 2.6. The importance of effective committee work and its responsibilities should be reflected in work-planning for individuals and their performance evaluation.**
- 2.7. Expert advice should be sought whenever required. Expertise within the University should be tapped as well as from external sources - with the transparency and accountability of the governance regime providing a defence against any perceptions of bias.**
- 2.8. The governance bodies need to develop a high level of accurate situational awareness, in terms of usage of the LMS, unmet needs and the current and future drivers for elearning.**

2. Structure the governing bodies to add value

2.9. Environment scanning of other uses for technology in education and of emerging technologies must be an ongoing focus for LMS governance and management. There will be a number of sources for such information whose participation in ongoing discussions must be encouraged. Such intelligence needs to be synthesised and shared.

2.10. A strong organisational perspective needs to be accounted for within the governance framework. Stakeholders and their representatives must recognise the importance of this organisational focus.

2.11. For an operational LMS, many of the representation issues can be addressed through appropriate client service methodologies in management practice and user-centred design principles in further system development activities.

3. Promote ethical and responsible decision making

University of Melbourne	Monash University
<ul style="list-style-type: none"> The UoM practice for decision-making within committees seems to be one of consensus – in this model by definition all decisions are unanimous, so what happens to dissenting views? Are they recorded? Are they tracked in any way? How is the practice of reaching consensus reconciled with the principle that accountability rests with designated individuals as per below? What is the purpose of a committee in this context? <p>Principles of accountability: “2.2 <i>Except at the level of the University Council or its committees, responsibility and accountability rest finally with designated individuals, never with a committee.</i>” http://www.unimelb.edu.au/publications/accountability/principles.html</p> <ul style="list-style-type: none"> The role, responsibility and authority of the LMS Board over IT and academic decisions is unclear. The channels for input to the board are not transparent. 	<ul style="list-style-type: none"> What should be the balance of IT versus academic considerations in decision-making? Who owns the service, and what does service ownership mean in decision-making terms if there is no convergence of line management between service owner and service provider until the VC? The project versus service aspect of the LMS is unclear and this impacts eg. on how maintenance upgrades to the LMS are treated.

<p>3. Promote ethical and responsible decision making</p>	
<ul style="list-style-type: none"> • TaLMET as the LMS Reference Group has considerable multimedia experience, but limited online expertise. There is a paradigm shift required to move from a focus on elaborate content to the transactional online space. • It is unclear what the formal constitution of the LMS users group is. 	
<p>Shared issues:</p> <ul style="list-style-type: none"> • There is a question of how to deal effectively with communication and the conflicting demands of related projects / services such as portal, directory service, student information system, HR / finance system, course databases, library services etc; • There is a need to adopt an effective mechanism to handle non-IT-related project interactions once a project has become an IT project within the IT Services area. 	
<p>3. Recommendations</p> <p>3.1. All governance processes must identify and support accountabilities for decision-making. It should be clear in each case who is responsible for each decision made.</p> <p>3.2. Decision-making must be disciplined with clear explanations on the record for each major decision.</p> <p>3.3. Decision-making must be transparent, with decisions and their rationale available to stakeholders.</p> <p>3.4. The governance must ensure effective communication about decisions and the reasons for them.</p> <p>3.5. Decisions should link to the identified strategies for the area. Where they don't those decisions and the rationale for them should feed into the review of such strategies.</p> <p>3.6. It should be recognised that the above recommendations (3.1 – 3.5) are required for organisational learning and improved performance.</p>	

4. Safeguard integrity in financial reporting

Shared issues:

Although identified LMS project costs are tracked responsibly, neither university has a good model for costing the following:

- Seed-funding for multimedia projects;
- IT projects themselves;
- The true cost of training and support, including informal training and “community of practice” models;
- The cost to faculties of adoption of the LMS in terms of faculty staff time;
- The hidden cost in the transfer of administrative duties to academic staff and vice versa (through inflexible LMS roles and changed workflows);
- Additional (or saved) time spent preparing materials;
- Academic time spent facilitating and monitoring online communications;
- Lost opportunities through staff time spent on LMS implementation and use versus other projects and priorities (ie. the opportunity cost);
- Competitive and marketing indicators: What evidence is there that the adoption of an LMS has:
 - Increased enrolments?
 - increased the quality of student intake?
 - contributed to any increase / or decrease in demand for staff positions ?
 - had an impact on brand awareness or perceptions of the university?
 - increased revenue from learning and teaching performance funds? (Note that UoM did very well in this area despite not yet having an LMS.)

4. Recommendations:

- 4.1. The universities must be in a position to present senior management and council with the real costs and exposures of elearning. The legal requirements for this must be recognised.**
- 4.2. Risk management must be improved (see section 7), not only in terms of systems, but the embedding of labour in the LMS. This understanding of risk must go beyond the IT domain.**
- 4.3. Effective cost models are a pre-requisite for effective management of elearning. There is enough experience at both Universities to develop these. It must be a priority. These models must be regularly reviewed and should ideally be dynamic. Contribution to accurate costings must be seen to benefit all stakeholders.**
- 4.4. There must be transparency about costs imposed on Faculties and other business units from elearning initiatives. With real costs and appropriate reporting comes accountability. Clear identification of the cost of central services, and the cost of Faculty compliance will contribute to ensuring cost and service effectiveness.**

4. Safeguard integrity in financial reporting

4.5. Current grant funding processes can distort process and financial reporting, by funding recurrent course support costs as projects that are unsustainable without ongoing investment. This leads to false expectations about costs. Both Universities need to work on the sustainability of elearning activities.

5. Make timely and balanced disclosure

University of Melbourne	Monash University
<ul style="list-style-type: none"> • Traditionally poor communication between ITS and faculties. • Lack of readily available IT change management and service interruption notification. • Under-developed and poorly publicised helpdesk services. <p>(Work to address these issues is in progress, through liaison roles and ITIL adoption)</p>	<ul style="list-style-type: none"> • Although a number of issues were brewing with respect to LMS service, these issues were able to be openly communicated and the dissatisfaction was with the resolution rather than the communication. • Monash ITS has clear change management and service interruption procedures, which for the most part it follows.

<p>5. Recommendations:</p> <p>5.1. Project tracking must be improved and made transparent.</p> <p>5.2. Accountability for progress must be reflected in performance management and project funding.</p> <p>5.3. Service performance must be made transparent.</p> <p>5.4. Issues management must be prioritised, appropriately resourced and communicated.</p> <p>5.5. All user feedback must be appropriately logged and dealt with. Issues outside the scope of current projects and services must be included in the knowledge base for future priorities decisions and projects.</p> <p>5.6. User groups must be supported to have a crucial role in both issue identification, issue resolution and the dissemination of responses to those issues.</p> <p>5.7. Real disclosure of service performance is necessary to ensure accountability and to build trust.</p>

6. Respect the rights of shareholders

Shared issues:

- It is somewhat problematic to determine who the shareholders of a central LMS service are, however Faculties, staff and students are the most obvious candidates. More broadly university “shareholders” including alumni. (The community and taxpayers may be regarded as stakeholders - see principle 9.)
- The rights of Faculties, staff and students may be thought of as the right to:
 - Be kept informed;
 - Be listened to;
 - Provide input and feedback;
 - Receive a high quality, relevant service;
 - Receive adequate support.
- Another issue which might be placed under this heading is the very real and destructive level of burn-out for key staff members involved in various aspects of LMS implementations. The difficulty of this work and organisational disappointment with outcomes often leads to superficial analyses of problems with individuals bearing the brunt.

6. Recommendations:

- 6.1. User-centred design is a critical paradigm for the development of effective services.**
- 6.2. User impact must be an ongoing dimension in the development and modification of projects and services.**
- 6.3. Stakeholder input should be mapped across the strategic, implementation and service dimensions of elearning activities. Adequate mechanisms and resources for dealing with this input will add value to the projects and services.**
- 6.4. The role of user groups should be identified and supported (see 5.6).**
- 6.5. Adequate resources must be allocated to the ongoing identification of user needs.**
- 6.6. Adequate resources must be provided to deal with user issues.**
- 6.7. Adequate resources to provide user support must be part of any service introduction.**
- 6.8. The central and faculty contribution to user support should be explicitly delineated and costed.**
- 6.9. Recognise the difficulty of working in this area and provide staff with adequate support, recognition and continuity. Be wary of organisational restructures and fully aware of their costs – good management and adaptive strategies can mitigate the risk to organisational knowledge and unreasonable personal cost.**

7. Recognise and manage risk	
University of Melbourne	Monash University
<ul style="list-style-type: none"> • There is a major risk to the University of Melbourne in having an implementation plan which is longer than the projected life cycle of the software being implemented. Most universities upgrade their LMS service each year or biannually although the magnitude of upgrades varies. The University of Melbourne had an 18 month implementation plan that has been extended over another year and will result in a full-scale production service on a platform that is a major upgrade from the piloted version. • In the LMS implementation up until late 2005 there were no generic communication plans used, no critical incident management procedures, no disaster recovery plans, no business continuity plans or basic IT risk management documentation • Risk management plans should be written to identify what specific action will occur if a projected risk eventuates (as well as risk mitigation strategies). • No clear project management methodology: home-grown methodology adapted from Thomsett or Prince2 but not clearly articulated – project management is based on documentation of processes and procedures and is of no use if it is not clearly articulated and then actively implemented and audited. (Update: this is currently in train). 	<ul style="list-style-type: none"> • Monash ITS has a clear project management methodology (which includes risk management), but its scope and authority is restricted to ITS. Other areas of the university can participate as they wish, but the voluntary nature of participation impacts on effective governance.

7. Recognise and manage risk

Shared Issues:

- There is a lack of clarity about decision-making.
- Failure to address issues of concern to stakeholders also places projects at substantial risk. Most evaluations of project management methodologies report poor sponsorship and poor decision making as the major cause of project failure.

Key dimensions of project risk in elearning are:

- Project failure risks;
- Quality risk – ie. lower teaching quality;
- Burn-out of staff;
- Risks to students in terms of disruption, loss of work, loss of assessment items;
- Opportunity risk(s):
 - Embedding extra costs;
 - Competition risks through misapplication of resources;
 - De-railing existing successes through lack of strategic analysis;
 - Fail to explore possible successes.
- Risks from key misunderstandings:
 - Embedding work in the wrong system;
 - Misunderstanding the dependencies and different assumptions within linked systems can produce risks to and from dependent projects;
 - Cultural disillusionment can be caused by false expectations;
 - Lack of attention paid to organisational knowledge can lead to the demoralisation of those with expertise as well as avoidable mistakes being made;
 - Strategic direction risk (getting it wrong).
- Reports to council backed by imperfect knowledge and incomplete costings can lead to financial and legal exposure.

Recent history at a number of universities suggests that these risks are both real and likely. Projects such as the Global University Alliance and Universitas21 have potentially committed universities to significant financial risk, with their speculative nature being poorly understood and the technical and market risk not fully accounted for.

7. Recommendations:

7.1. Both institutions need to be prepared to kill projects if there is a high level of risk. Any project with a number of high probability / high impact risk factors should be a candidate for close monitoring and potential termination, irrespective of the resources already committed.

7.2. Project Offices would be more effective at managing risk if they were independent of IT service divisions. Ideally they would operate at a relatively autonomous level reporting to the Senior Executive and Faculties / Divisions as required. The Growing Esteem project office could be an example of how strategic initiatives can be handled across an institution.

7. Recognise and manage risk

- 7.3. The risk of institutional rejection of an initiative needs to be mitigated by allocating more resources from a project or service to the areas of consultation, communication, issue resolution and better governance practices.**
- 7.4. A consideration of opportunity costs needs to be factored into the risk analyses for initiatives.**

8. Encourage enhanced performance

Shared issues:

Both institutions require clearer objectives, better benefit-cost models and reporting compliance in the elearning domain for any meaningful performance evaluation. Such evaluation is a necessary precursor to any objective measure of performance improvement.

Improved governance processes associated with these required changes will encourage enhanced performance through effective strategic alignment, transparency, needs analysis, knowledge of technology options, organisational learning and improved responsiveness and flexibility.

Teaching quality issues are problematic, but a detailed analysis of these issues goes well beyond LMS and their governance, except and insofar as to say that LMS use is not of itself a necessary or sufficient indicator of quality.

8. Recommendations:

- 8.1. Embed goal-focused project evaluation.**
- 8.2. Perform “double loop” evaluation with both the project/service and the organisational implications being considered.**
- 8.3. Ensure commodity services are run efficiently and responsively to free-up resources for other developments.**
- 8.4. Provide institutional support for initiative and experimentation, with a requirement as part of this support for effective evaluation and dissemination.**
- 8.5. Ensure responsiveness to emerging needs and technologies through effective communities of interest, the support of experimental usage of technology, and cross-institutional dialogue and networking.**
- 8.6. Treat quality holistically: avoid the temptation to have more than minimum set of quality standards.**

9. Remunerate fairly and responsibly

Note:

It is difficult to conceptualise “remuneration” in this context. The key dimension addressed by this principle in the corporate context is one of ethics and accountability. The closest issue to this in university elearning is the common perception at a faculty and other group level that having representation on a committee which has either the responsibility for the distribution of funds or can direct the provision of central services provides an opportunity to influence favourable outcomes for the faculty or group. While this is doubtless part of the *realpolitik* of university funding, it can both distort behaviours and distract from proper advice and overseeing functions. Decisions with a financial implication must be, and be seen to be, defensible and done on a clear and agreed basis – not as the result of factional trading from a position of influence.

In terms of responsible funds distribution, it is worth considering whether teaching quality awards and rewards, or special teaching development funding have demonstrated a real sustainable improvement in practice or the expected dissemination (see: Acumen Alliance (2003) Multimedia Development Review; the Melbourne-Monash Review on project grants (Kielgardie et al., 2005); The James (2000) and Fritze (2002) reports on the impact of development grants; and The Carrick Institute report on dissemination (McKenzie et al., 2005).

9. Recommendations:

- 9.1. Separate the responsibility for funds distribution from governance activities.**
- 9.2. Investigate the implications and demonstrated consequences of awards and development money.**
- 9.3. Expect LMS use to be sustainable and funded through business cases rather than requiring additional development project funding.**
- 9.4. Be wary of embedding LMS use as a criterion in the performance management of groups because of the distortion that this can encourage.**

10. Recognise the legitimate interests of stakeholders

Note:

Stakeholders in this governance context are not the same as stakeholders in the project management sense. In this context, stakeholders can usefully be thought of as groups outside the University with an interest in the Universities' activities.

10. Recommendations:

- 10.1. **Improved transparency around elearning should be pursued with the default position for related information being to make it publicly available. This will contribute to building community support for the Universities' activities. It is also a useful aid to internal discipline.**
- 10.2. **Community access should be seen as a key part of the Universities' information and communication strategy as well as fulfilling community engagement policies.**
- 10.3. **Access and equity concerns must be addressed at all levels of elearning activities.**
- 10.4. **Prospective students deserve the truth about the university's LMS and how it's actually used – not aspirational marketing spin.**

A note on committees

While there are many parties involved in governance, it is the role of committees that is most often considered to be problematic. We will specifically consider how good practice might apply to the many committees with a role in LMS governance.

Roles of committees

There are a number of types of committee operating within Universities, performing one or more of the following functions:

Governance committees allow participation in decisions affecting the organisation as a whole. Such a deliberative committee may be given the power to make decisions, or to make recommendations to decision-makers.

Coordination committees involve individuals from different parts of an organisation meeting to discuss: developments in their areas; cross-organisational projects that cut across organisational boundaries; and to talk about future options.

Specialist subcommittees perform specialised functions in support of larger committees. In the University setting some of these have ongoing oversight of a specialist area eg. Finance functions.

Advisory committees tap into expertise (both within and beyond the committee itself) to research and recommend on areas of organisational interest or specific project proposals.

Project committees including steering groups and implementation committees are directly part of project governance and in some cases (despite recognition that accountability issues make this poor practice), may have some, often poorly defined, responsibility for aspects of decision-making.

Executive committees are subsets of larger groups authorised to make some decisions on behalf of the entire group.

Representative committees are often dysfunctional in principle and practice, but define many University committees, where they can be used to endorse activities, diffuse responsibility, and both contribute to and cover-up inadequate communication, information and expertise. A committee which can define itself purely as representative may be symptomatic of organisational failure.

Unofficial and ad-hoc committees often form around particular shared interests or particular issues.

Committees allow relevant expertise to be drawn from different parts of an organisation and can facilitate the sharing of information and coordination of action. They can be used to build useful consensus. They can help the organisation access different viewpoints and can be used to share out responsibilities.

Well-known problems with committees include their potential contribution to organisational procrastination – even decision-making paralysis. They are famously implicated in the adoption of ineffective compromises. Poorly constituted, they can contribute to a lack of clarity in decision-making and responsibility, demonstrate groupthink, and embed poor communication from the often unwarranted expectation that representatives are in active communication with the areas and people they represent. Committees may be prone to manipulation and various forms of intimidation. They can also rubber-stamp executive decisions. Another affliction is conflict between different committees and between committees and operational areas, and in the area of governance between committees and executive functions. Committees can delay and reduce organisational responsiveness. They can actually lead to a loss of organisational learning when responsibilities are shifted to unaccountable disengaged groups and like other parts of the university they can be fractured from re-structuring. Last but not least they can have a high opportunity cost with high-value people being tied up inappropriately or for little gain.

Productive use of committees then is vital and not something to be taken for granted. An effective committee requires:

- A legitimate *raison d'être* explicitly captured in the Terms of Reference which should be periodically reviewed;
- Clear authority (particularly in relation to the executive and operational management);
- Explicit boundaries;
- Organisational understanding;
- Proper leadership. Committee chairing is vital;
- Clear and agreed expectations of the members;

- Reliable and multiple formal and informal communication channels into and out of the committee;
- Shared identity: ie. that the committee knows what kind of committee they are;
- Effective links with management, the executive and senior committees;
- For governance committees especially it is vital to know where the demarcation of responsibility for decisions and operational matters lies;
- Discipline and corporate memory;
- That it be a site where double loop evaluation can occur, ie. where there is evaluation of both services or projects and the organisational implications of this.
- Committees should self-regulate to the extent that they recognise their strengths and weaknesses and actively work to improve their performance.

This list of requirements is well understood. In the area of educational technology however there are inherent problems because the domain is positioned between: Teaching and Learning; Administration; Policy; Quality; IT; Libraries; Facilities Management; Strategy etc. Many of the issues that an LMS brings to the surface derive from, and belong to, other areas. They should be dealt with in those areas with appropriate advice on the impact of policies and priorities being gathered from the key committees and operational areas supporting the LMS.

While we are arguing that LMS is in essence an IT system, there is a place around its operational management for gathering and presenting the intelligence on what is happening online, what could be happening, and recommending what should be happening. This information will typically come from the committee(s) with responsibility for LMS governance (see Table 2 below) as well as cross-university forums devoted to effective support for IT users. These are the listening sites, the places where networked communities of practice, patterns of use, and identification of needs can become visible to the University. So there is still a role for a committee structure to support IT's application to teaching and research. This committee work should be framed by a realistic understanding of the nature of corporate LMS and equally of new approaches like Web2.0. The committee should gather and access expertise and organisational learning, and have a clear view of organisational capacity and the relevant strategic drivers. This committee work should ideally be part of the wider IT governance, not an LMS ghetto.

Table 3 below outlines the committees and other groups who typically have a role in university LMS governance. The table describes the committees and membership and outlines the major responsibilities of and issues for that committee. We then recommend action in line with good practice. There is no ideal committee structure for LMS governance, there are ways of ensuring better alignment and clearer responsibilities; delivering more effective linkages with LMS management; providing better advice; promoting effective project oversight and ensuring appropriate input from current and prospective users.

Table 3. Committees and groups typically involved in LMS.

Committee / Group: <i>Membership / Membership qualities</i>	Responsible for: <i>Issues</i>	Recommended Action
<p>LMS Implementation</p> <p><i>Variable – typically senior management, IT management, senior Faculty representation (eg. Assoc. Deans I.T.)</i></p>	<p>Oversight of the project.</p> <p>Typically has some aspect of broad ‘representation’.</p> <p><i>Lack of clarity about decision-making.</i></p> <p><i>Tension between representation of faculty interests and university-wide perspective.</i></p> <p><i>No training in project governance issues – variable skills.</i></p>	<p>Replace with smaller Project Board for duration of project.</p> <p>Ensure that appropriate consultation has occurred before project commencement and is captured in needs / specification and functionality documents.</p> <p>Run implementation projects quickly.</p>
<p>Project Advisory Committees</p> <p><i>Identified experts with the ability to effectively participate.</i></p> <p><i>Some senior IT savvy managers.</i></p> <p><i>ITS technical expertise.</i></p> <p><i>Organisational knowledge (“grey beards”).</i></p> <p><i>Planning and organisational capacity knowledge.</i></p>	<p>New projects</p> <p><i>Not often used in universities – these duties tend to be added to standing committees which often lack the expertise.</i></p>	<p>Should be used where required and should tap into formal and informal communities of practice and make use of expertise and situational awareness.</p> <p>They must take account of organisational capacity and organisational learning.</p>
<p>LMS Governance Board</p> <p><i>Variable – typically ITS representation; Assoc. Deans IT; others.</i></p>	<p>Oversight of service.</p> <p>Often a subcommittee of senior Academic IT Committee.</p> <p><i>Demarcation of responsibilities with LMS IT management.</i></p> <p><i>Tension between faculty and university-wide perspective.</i></p>	<p>An option to reduce governance complexity would be to move this responsibility to a defined and delineated combination of: LMS User Group; IT Service Management; Senior Academic IT Committee.</p>
<p>Senior University IT Committee or Senior Resources / Finance Committee</p> <p><i>Senior Resources Management; Senior ITS management; Financial</i></p>	<p>Enterprise Systems (Finance, HR)</p> <p>Often with a financial focus.</p> <p><i>This committee’s endorsement is often required for spending</i></p>	<p>This committee may overlap with the senior academic IT committee, or it may have a more resources- focus. They typically concern themselves with the big-</p>

Committee / Group: <i>Membership / Membership qualities</i>	Responsible for: <i>Issues</i>	Recommended Action
<i>expertise; Risk assessment expertise</i>	<i>required for spending approval on LMS. It can lack expertise in LMS (especially around Faculty costs, support issues, content provision issues and issues of organisational acceptance of LMS) Its authority can lend unjustified support for misguided strategies related to LMS.</i>	ticket items. The enterprise IT system model of LMS may be replaced by a more diverse sustainable and lower cost networked Web2.0-supported model which may not enter the sphere of Big IT. Or it may necessitate high level partnerships with Web2.0 service providers. In any case this committee (like University Council) should demand better quality process adherence, business cases and insight into elearning from the university.
Faculty IT managers Committee <i>Faculty IT managers</i>	<i>Labs etc. Faculty-level infrastructure. Day to day technical and support issues. Downstream responsibility for implementing and supporting strategic decisions. Frustration at limited access to decision- makers.</i>	Keep this committee. Continue to access their technical expertise both formally and informally. Formally and informally encourage their access to decision-makers. Encourage assertiveness. Identify and support (but don't tamper with) their communities of practice.
Senior Academic IT Committee <i>Faculty Assoc. Deans IT; ITS representation;</i>	<i>Distribution of funds. Establishment of priorities. Setting of service standards. Agenda can be driven by forceful individuals, ITS Difficulty representing diverse groups within faculty. Lack of technical expertise at hand can lead to uninformed decisions. Culture of little formal</i>	This committee must take control of the listening / reporting function. This is the place for capturing IT usage, needs and presenting possibilities to the University. Move away from unsustainable distribution of project funds. Give prominence to Faculty IT plans and ensure ITS provides services to support them.

Committee / Group: <i>Membership / Membership qualities</i>	Responsible for: <i>Issues</i>	Recommended Action
	<p><i>organisational learning can lead to inaccurate received truths.</i></p> <p><i>Grab-bag of issues can come up with little strategic framework.</i></p> <p><i>Culture can lead to lack of openness about issues / misrepresentation.</i></p>	<p>This is the point at which to conceptually integrate research and teaching systems.</p>
<p>LMS User Group</p> <p><i>LMS Users – typically academics, it should also cover student interests and administrators issues.</i></p> <p><i>LMS support groups – central and faculty must be part of this group.</i></p>	<p>Feedback on LMS system and service.</p> <p>Key user input to administrative settings and rules.</p> <p><i>Requires real commitment from LMS Management.</i></p> <p><i>Requires sufficient resources and continuity in LMS Management (ITS) for mutual understanding and resolution of issues.</i></p> <p><i>Shouldn't be used to rubber stamp decisions made elsewhere.</i></p> <p><i>Needs good committee chairing and process to ensure issue resolution is the focus and that LMS management are held accountable.</i></p>	<p>Maintain and strengthen.</p> <p>Make a key communication channel.</p> <p>Seek input from here to LMS planning.</p> <p>Give this group along with LMS Management rights and responsibilities for administrative decisions around eg. Semester roll-over dates.</p> <p>Requires dedicated resources from LMS Management (in ITS) to support this group. This support can be in the LMS support team, but must be accountable to LMS service manager.</p>
<p>Faculty IT Committee</p> <p><i>Stakeholders; Assoc. Dean IT; Faculty IT manager; Faculty IT support groups</i></p>	<p>IT issues within Faculty</p> <p><i>Knowledge of and input to other decisions, Maintaining interest.</i></p> <p><i>Diverse interests and viewpoints</i></p>	<p>Continue to be a major activity for dissemination, consultation by Faculty Assoc. Dean IT.</p> <p>Acknowledge and further support informal networks from here.</p>
<p>Other groups eg. Related projects (CMS, Authentication, SIS, HR)</p> <p><i>Various – ITS; Administration – central and faculty</i></p>	<p>Delivery of project / service.</p> <p>Often integration component with LMS.</p> <p><i>Limited resources for system integration.</i></p> <p><i>Lack of knowledge of</i></p>	<p>Use transparent reporting and explicit cross-committee expectations to ensure dynamic alignment of groups.</p> <p>Move the project integration function out</p>

Committee / Group: <i>Membership / Membership qualities</i>	Responsible for: <i>Issues</i>	Recommended Action
	<p><i>implications from their projects / services to LMS.</i></p> <p><i>Getting buy-in from other services / areas.</i></p> <p><i>Questions of authority and power.</i></p>	<p>integration function out of ITS – University-wide Project Office.</p>
<p>Communities of practice</p> <p><i>Various - open</i></p>	<p>Various</p> <p><i>Value not regarded by the organisation.</i></p> <p><i>Frustration at inability to influence organisation.</i></p> <p><i>Frustration at organisational blocks to using these networks.</i></p>	<p>At multiple levels within the university recognise, support and listen.</p> <p>Invite participation in formal enterprise processes.</p> <p>Over time develop systems that use this communities of practice model as a central, critical part of project development and support.</p>

Section 2: Future Directions

LMS governance: an organisational analysis

While the preceding analysis of LMS governance offers a clear picture of good practice and these principles are well known, it is curious that they have not in many cases been followed. Indeed there are some seemingly intractable problems in the area of governing and managing LMS that have defied many determined attempts, at many universities, to resolve them. Almost 10 years into the ‘project’ of university LMS adoption, it’s not getting any easier. But is it simply a question of governance? We contend that these issues are symptomatic of:

- 1) **Systematic misunderstandings**: about what LMS really are, about what they can deliver; about the ways the University best functions; about how to go about managing the fit of LMS into the university to get the best out of both.
- 2) **Process and organisational blocks and failures**: reporting failures and other project issues; the place, structure and purpose of committees; the framing and utility of an elearning strategy; the lack of effective costing models and analysis of return on investment and a range of unresolved issues to do with quality and standards.
- 3) **Lack of organisational learning**: knowledge about LMS and elearning is so fragmented and disparate despite the individual and organisational effort put into the enterprise that there is no substantial shared knowledge base.
- 4) **Ineffective use of communities of practice**: the real expertise within the university is not visible to it, and is replaced with structures that actually inhibit these distributed learning processes and sites of expertise.

Resolution of these issues is a prerequisite for good governance, and indeed, for the sustainability of the elearning enterprise. If a university wishes to improve its current processes within its current frame of understanding it should adopt the ‘good practice’ recommendations. To move forward to a sustainable footing however, it must adopt a better model of its teaching and research practice and better understand itself – what works and what doesn’t in the context of that university. For too long elearning has been attached to the front of a battering ram of organisational change. Pragmatically the university needs to consider whether any elearning activity is worth doing, and determine whether it is organisationally possible in a sustainable way. Therefore we propose to widen the scope and change the frame so that the organisational issues can be teased out. Only then can appropriate LMS and elearning governance processes really be considered.

To analyse the LMS issues from this wider organisational perspective we will look in some detail at the business case for LMS. We will then focus on issues around educational technology research to see what this can tell us about the apparent lack of organisational learning. As we have been alluding to, there are some fundamental challenges to elearning coming from the evolution of the web to ‘Web2.0’. We will investigate these and describe in some detail what Elearning 2.0 might involve. In the light of these organisational explorations, we will propose a framework for managing in a complex environment which will lead to a series of recommendations for becoming a learning organisation in a networked world, which we propose is the appropriate frame for a university to manage elearning and much else besides.

Recommendations for elearning sustainability

This second set of recommendations derives from the following analysis of the organisational implications of the elearning experience to date and the review of the new paradigms in the area:

- (1) As with other technologies, as new elearning tools become core, they should be moved into the domain of IT management and governance.

The University should:

- (2) Recognise the nature of elearning and LMS: what it is, what it isn't; what it can do, what it can't; what it inhibits;
- (3) Continue with, and formally recognise the ecology of elearning use where faculty systems, meeting faculty needs, interplay with central systems and individuals' own solutions. This mix should ideally be optimised for the best mixture of efficiency, manageability, innovation and personal needs. The other dimension affecting each of these nodes is the ongoing development of new technologies external to the university.
- (4) Further encourage faculties to operate as listening, coordination and prioritisation centres for educational technology in addition to their support and service roles.
- (5) Support, at faculty and central levels, multiple channels for communication, information and communities of practice. Allow and encourage these to feed into or develop into more open listening-focused formal structures of governance and management.
- (6) Continue to develop better quality business plans as the basis for support of IT initiatives both locally and centrally. In particular look seriously at options for partnering.
- (7) Evaluate the real effectiveness of project funding in elearning systems and content development. Recognise the past history of dissemination strategies and the potential distortion of funding outside achievable return on investment parameters. Move to elearning models that are less content focused, more transaction focused.
- (8) Over time, migrate the core enterprise IT systems and data sources to a more adaptable, open structure to enable support for multiple tools and personalised interfaces.
- (9) Address issues of organisational boundaries and borders in more flexible ways. Use these to advantage. For example an analysis of the teaching / research boundary and the boundaries and links between an individual's university identity and other identities will generate many ways to add value.
- (10) Make use of the skills and professionalism of all staff, by encouraging processes and evaluations that are based on trust and responsibility.
- (11) Adopt a listening and user-centred focus for educational technology across the organisation. Make looking for user needs and current educational and communication technology usage a core part of the role of those involved in educational support. Gather this as input into the governance structure.
- (12) Develop elearning plans and strategies that recognise these points (1-11) and provides a framing for them. The strategy must have ongoing consultation dialogues at its core, and should be dynamically updated by this discussion.

- (13) Develop governance processes that facilitate and demand:
- a. **Effective ‘clearance’ of issues of policy and administration to where decisions about these issues are properly made.** These referrals should be accompanied by succinct outlines of the implications for elearning.
 - b. **Organisational learning.** The governance processes must become the site for ‘double loop’ evaluation, where the organisational impact of elearning projects is considered, evaluated and recorded.
 - c. **Active listening.** It is vital that the governance processes listen to and provide pathways in from stakeholders and communities of practice.
 - d. **Open communication** and the ability to frame and re-frame issues, to allow progress on understanding of educational technology issues.

Reviewing the business case for LMS

LMS drivers

Within the business-oriented project management framework, a project is based around a business case deriving from perceived business requirements. The business case for LMS has been driven by a number of factors. Although access, cost and quality are three commonly asserted reasons for adoption of educational technology, Coates et al. (2005) identified more specific drivers behind the introduction of enterprise level LMS.

1. LMS as a means of increasing the **efficiency of teaching**;
2. LMS and LMS-based resources giving the promise of **enriched student learning**;
3. **Student expectations** for advanced technologies;
4. **Competitive pressure** between universities;
5. LMS as a means of providing **greater access** to higher education;

A sixth factor identified by Coates et al is more subtle, and identifies LMS as part of an important culture shift taking place in higher education.

“LMS offer universities hitherto undreamt-of capacity to control and regulate teaching. From a managerial perspective, the disorder associated with academic independence and autonomy in the teaching and learning process can appear chaotic and anarchic. The management and leadership of academic communities requires, correspondingly, a high tolerance of uncertainty, but such tolerance is increasingly in short supply in an era of attention to quality assurance and control. LMS may appear to offer a means of regulating and packaging pedagogical activities by offering templates that assure order and neatness, and facilitate the control of quality. The perceived order created by teaching and learning by LMS is, we suspect, one of the more persuasive reasons for their rapid uptake.” Coates et al., 2005

The ability to control, regulate and audit teaching through an LMS sits uneasily with the portrayal of LMS as harbingers of innovation and change to traditional university pedagogy. On the one hand, online learning (delivered via central LMS) will allow unprecedented opportunities to build enriched student-centred learning environments and communities of practice free of spatiotemporal constraints; on the other hand, LMS provide a means to create perceived order in teaching and learning practice. This is an example of the intrinsic tension between creativity and innovation versus regulation and control in the domains of pedagogy and management respectively, and has strong implications for the approach to governance.

1. Efficiency of teaching

On the surface, a desire for efficiency seems harmless enough, but when it is viewed as a manifestation of the culture shift referred to above, the position of the LMS at the nexus of the managerial versus collegial divide is brought into sharper focus. The flexibility of formal governance structures imposed around the LMS will reflect whether the management perspective has taken precedence over tolerance of uncertainty.

LMS implementation to support efficiency of teaching will focus on automated procedures for administrative functions (eg. enrolment, course creation, activation, archiving and auditing) and functionality to allow programmable content release, automated assessment tools and online assignment submission.

Enterprise LMS support efficiency by sharing data with other enterprise systems (eg. Student Information System, Human Resources System, Authentication Services etc) and have an implicit command-and-control management model required by the technocratic approach to corporate data. Tolerance of uncertainty along with independent and autonomous decision-making are not conducive to efficient data-sharing and are, at least superficially, at odds with a strong focus on formalised governance structures.

The automation of course access based on correct enrolment is an example that highlights this uncertainty in a seemingly simple aspect of LMS. The system assumes that enrolments are fixed in a way that limits student freedom to change courses and limits the freedom of academic staff to perform 'pastoral care' by relaxing regulations on the basis of individual student needs, or even mitigate the effects of inefficient administration elsewhere in the data chain.

2. Enriched student learning

Evaluating delivery on the promise of enriched student learning through LMS and LMS-based resources remains contested. Our literature review revealed a vast array of information about individual projects and case studies, much of it descriptive, some of it claiming to be evaluative, some of it claiming a theoretical framework, some of it supporting a particular pedagogical approach. However we have found nothing compelling in any of the literature to demonstrate enriched student learning attributed specifically to LMS or LMS-based resources that could not be imagined in another learning environment.

There are many claims that online learning and educational technology will result in a transformation of the teaching and learning paradigm, but only a small proportion of studies go beyond futuristic assertions and enthusiastic descriptions of technology use. More often than not, all that is revealed is a misunderstanding of current learning environments, and/or a lack of imagination with respect to the potential of "traditional" learning environments rather than any evidence of transformation or transformational potential *per se*.

3. Student expectations

Much has been written about student expectations with respect to elearning and educational technology but very little has been tempered by consideration of what student expectations of university were prior to the emergence of the new technologies and how realistic or relevant these expectations were to students' capacity for learning within the higher education context. Unrealistic expectations can be managed by clearer communication. Realistic expectations that are relevant to the capacity to learn a discipline area should be addressed in an appropriate way, through technology or otherwise. But the mere fact that someone voices an expectation about something should not by itself be posited as a sufficient justification for the need to meet that expectation. The basis and relevance of expectations with respect to the job at hand should be examined carefully especially where cost implications are high.

Mark Prensky has been very influential in terms of highlighting student expectations with respect to technology. He coined the terms "digital native" and "digital immigrant" to distinguish between those who grew up with the new technology and those who didn't.

"Unfortunately for our Digital Immigrant teachers, the [Digital Native] people sitting in their classes grew up on the "twitch speed" of video

games and MTV. They are used to the instantaneity of hypertext, downloaded music, phones in their pockets, a library on their laptops, beamed messages and instant messaging. They've been networked most or all of their lives. They have little patience for lectures, step-by-step logic, and 'tell-test' instruction." Prensky, 2001

Prensky goes beyond commenting on differences in behaviour by also suggesting (albeit somewhat tentatively) a concomitant change in brain structure and function:

"... it is very likely that our students' brains have physically changed – and are different from ours – as a result of how they grew up. But whether or not this is literally true, we can say with certainty that their thinking patterns have changed." Prensky, 2001

While in a very superficial sense, physical brain changes in digital natives might be supportable, in any meaningful evolutionary sense substantive brain changes are highly unlikely. The degree to which this is a strong claim versus an ambit claim represents the degree to which the whole concept of digital natives should be taken seriously: if digital native brains are significantly different from their digital immigrant parents and teachers, we need to consider appropriate action. However if 'thinking patterns' and culture are all that differs, is there really any issue? Many digital immigrants also "*have little patience for lectures, step-by-step logic, and 'tell-test' instruction*" but their restlessness and lack of attention has a different manifestation. Based on the digital native / digital immigrant divide, Prensky asks the question now echoed in schools and universities around the world:

"Should the Digital Native students learn the old ways, or should their Digital Immigrant educators learn the new?" Prensky, 2001

He goes on to argue that:

"Unfortunately, no matter how much the Immigrants may wish it, it is highly unlikely the Digital Natives will go backwards. In the first place, it may be impossible – their brains may already be different. It also flies in the face of everything we know about cultural migration. Kids born into any new culture learn the new language easily, and forcefully resist using the old. Smart adult immigrants accept that they don't know about their new world and take advantage of their kids to help them learn and integrate. Not-so-smart (or not-so-flexible) immigrants spend most of their time grouching about how good things were in the "old country."

So unless we want to just forget about educating Digital Natives until they grow up and do it themselves, we had better confront this issue. And in so doing we need to reconsider both our methodology and our content. First, our methodology. Today's teachers have to learn to communicate in the language and style of their students. This doesn't mean changing the meaning of what is important, or of good thinking skills. But it does mean going faster, less step-by step, more in parallel, with more random access, among other things. Educators might ask 'But how do we teach logic in this fashion?' While it's not immediately clear, we do need to figure it out." Prensky, 2001

Every generation has suffered a "generation gap" of seemingly insurmountable distance. And at some level, entrainment of "thinking patterns" and culture (thereby enforcing some level of historical connection between future and past

generations) is precisely what our education system is about. Student expectations have rarely been given great weight in the past and it is not clear that there is any particular enlightened reason for that position to change.

To follow another take on student expectation, Kerri-Lee Krause (2005), looks at teaching strategies for student engagement. For Krause, student engagement involves *“the time, energy and resources students devote to activities designed to enhance learning at university. These activities typically range from a simple measure of time spent on campus or studying, to in- and out-of-class learning experiences that connect students to their peers in educationally purposeful and meaningful ways.”* Krause encourages us to take a broader view of engagement and developed ten principles for enhancing student engagement. We discuss the impact of LMS and other online services on the ability to operate by those principles in Appendix 1. Broadly an LMS can add to student engagement, but not in and of itself - the critical factor is how it is used. LMS is not the only means by which this can be achieved, indeed other online services can and currently do contribute to the informal learning opportunities that are critical to active engagement with a body of knowledge through a learning community or network.

The potential impact of LMS on student engagement is of great concern to university educators eager to tap into the possibility of using technology to communicate with students and enhance their learning. However availability of online communication tools is of far less concern to students themselves. Online communication tools are now assumed to be an integral part of any online environment and there is a vast array of free interactive online services to choose from on the web. Students will only care what online communication tools are provided for them by the university if access is denied on campus to their standard tools (eg MSN, yahoo, gmail, Skype, myspace, Flickr, YouTube, etc). Although much is being made of the age-related distinction between “digital natives” and “digital immigrants”, this digital divide is more likely to be based on the ease of access to the internet. Always-on broadband internet is available in many workplaces and schools, and increasingly in people’s homes. Once online tools and mobile phones have been fully integrated into the range of choices available for communication, the communication medium selected for any given communication will be based on convenience, cost and efficiency in a given situation.

4. Competitive pressure

There is clearly a strong perceived competitive pressure on universities to provide central LMS services and the vast majority of universities in Australia have a central LMS. It is not surprising that students and staff expect an LMS because purely statistically, this expectation will be met. There is far more limited information as to what influence, if any, the presence, the quality or even absence of LMS service has on the final university selection of students or staff. Few universities supply any easy way for prospective students and staff to explore online learning facilities prior to joining the institution so on this basis alone it is unlikely that the quality of online learning facilities plays a direct role in competition for students and staff.

There has been strong pressure in terms of funding initiatives over the past ten years to support the contention that elearning and multimedia are convenient indicators to government and other auditing agencies of the quality of teaching

and learning. However recent world university rankings (for example Shanghai Jiao Tong University's Academic Ranking of World Universities, <http://ed.sjtu.edu.cn/ranking.htm>) focus mainly on indicators of research quality rather than teaching quality. At the same time, there has been a shift in government funding emphasis away from teaching and learning (and hence from educational technology and online learning support) towards research (and hence Eresearch and grid computing). It remains to be seen whether this change in funding focus will reduce the perceived competitive pressure relating to LMS and educational technology.

More importantly in terms of evidence base for the role of LMS in perceived teaching and learning quality, the University of Melbourne performed very well in the 2006 Learning and Teaching Performance Fund, despite the absence of a fully implemented central LMS service.

5. Greater access

There is no doubt that online learning has the ability to provide greater access to university for people in remote areas or for people with temporal or geographic barriers to further education. There is also the possibility of using online learning to provide access to people with other barriers to participation in higher education (eg. social and financial barriers). This latter form of access is not easily promoted via a password-restricted enterprise-level LMS. The role of LMS in facilitating business continuity in the event of natural disasters, epidemics or terrorist activities is an aspect of access that should not be overlooked.

A key feature of the supposed "new pedagogy" for elearning, based loosely around social constructivist notions of student-centred learning within communities of practice, is that of building online learning communities to facilitate learning outside of formally structured teaching episodes. As will be argued elsewhere in this report, this pedagogy is not well-supported within an LMS.

Summary of LMS drivers

The following table summarises the validity of perceived drivers for LMS. Since business cases are built around these perceived drivers, and project objectives and priorities derive from business cases, the drivers should presumably be representative of the ideals around which governance processes are framed.

Table 4: Analysis of the drivers for LMS in terms of actual LMS capability.

Perceived Driver	Is This Valid?	Comments
(1) Efficiency	Yes	LMS can be used to improve efficiency in subject administration, but this can affect flexibility and adaptability of academic governance around teaching (eg students must be correctly enrolled in courses to obtain access to courses; staff must be assigned appropriate course roles; guest entry / quality auditing has constraints; "conversations" (in discussion areas) are monitored; etc)
(2) Enrichment	No	Educational technology can be used to enrich

Perceived Driver	Is This Valid?	Comments
		subjects but this does not require LMS and is rarely the only method to supply such enrichment.
(3) Expectation	Not relevant	Student expectations around expecting that universities will have an LMS are valid (based on the omni-presence of LMS) but their real expectations of how the LMS might add value have not been framed in an educationally relevant way. Concept of 'digital native' has not been established with any theoretical clarity and in any case, 'digital natives' are unlikely to want to be constrained in their online activities by LMS boundaries.
(4) Competition	No	No evidence that LMS affects enrolment choice. No compelling evidence of LMS impact on funding derived from quality assurance of learning and teaching performance.
(5) Access	Maybe	Online learning environments can improve access to learning, but course-based LMS are not optimised to do this. Access to resources in the case of disaster or disease would be facilitated by LMS.
(6) Control and regulation	Yes	LMS can be used for this purpose, but see point 1 above to consider the impact of this characteristic of LMS implementation on flexibility and autonomy of teaching.

LMS drivers and LMS governance

LMS are here to stay for the medium-term future, whether they are needed or not, and indeed, despite there being no clear advantages or disadvantages of relatively early implementation (at Monash) or late implementation (at Melbourne). Despite the majority of the perceived drivers for LMS being contestable, the perceived requirement for a central LMS seems to be entrenched in the mindset of the university sector. This situation itself suggests a significant failure of governance exemplified by:

- The fact that LMS projects at both universities were implemented without a solid business case and without strong strategic commitment is a failure to follow decision-making procedures that are currently in place. This governance failure was compounded by a subsequent failure to identify that such processes were not actually followed, despite there being checks and balances in place for this purpose. Neither Melbourne nor Monash appear to have any clear articulation of the objectives for their LMS implementations, nor any clear idea of who "owns" the LMS (is it IT infrastructure or an academic service?)
- The fact that given the continued absence of a solid business case and failure to achieve full-scale implementation after more than 3 years work at Melbourne, there does not seem to be an organisational process

to terminate such a floundering project once it has commenced. The ability to terminate a project did not seem as critical an issue for Monash because once an IT project has been funded, project methodology within ITS is sufficiently entrenched to ensure that implementation proceeds relatively smoothly on the working assumption that the objectives have been considered somewhere outside ITS.

For projects that go ahead without a solid business case and no obvious consequences to core business of implementation versus failure to implement (other than substantial financial cost!), it would seem that a number of project management governance processes have become largely irrelevant. Instead of playing lip service to governance processes relating to stakeholders, communication and best-practice, it would be far more effective to accept the arbitrary nature of decision-making, determine arbitrarily what is to be implemented, implement it, tell people what is available, and either mandate its use or let people use it at their pleasure. If it is not what people want and they have choice, they will not use it. If it is not what they want but they have no choice, they will reluctantly adapt to it. If it is exactly what they want, they will be happy, but will probably forget to tell you. Once people begin to use a system, they tend to adapt to its idiosyncrasies in surprising and creative ways. The empirical evidence from usage figures and outcomes can then be used to determine what happens next.

elearning research: theory and practice

In the preceding section, it was concluded that, irrespective of sustainable business case, LMS will be supported at most universities for at least the medium term. Coates et al (2005) identify a number of issues surrounding ubiquitous LMS adoption in the higher education sector and in the following paragraph, they warn of the dangers of ignoring the educational perspective in LMS adoption:

“The future position of LMS in higher education needs to be the subject of vigorous educationally-focussed public discussion and debate. LMS have tended to attract the attention of technicians, administrators and typically a small number of academic staff with a direct interest in online learning. Given the likely effects of the systems, however, it is essential that discussions about LMS make reference to a wide range of people and perspectives. Decisions about university teaching and learning should not be restricted to checklist evaluations of technical and organisational factors. It is vital to maintain the educational perspective rather than emphasise any technological determinism which takes specific characteristics of LMS or teaching for granted. In particular, discussions about the adoption, implementation, use and review of LMS should involve ongoing iterative dialogue with the large and diverse group of academic stakeholders who are, and will increasingly be, affected by the systems.”

Coates et al., 2005

We begin an iterative dialogue around LMS, elearning and pedagogy as the basis for promoting a community of practice around online learning (Project Objective 2) based on a coherent research framework for the ongoing use of an LMS (Project Objective 3)

The challenge of providing a coherent research framework for online teaching and learning derives in part from the difficulty in discourse across discipline boundaries when discussing pedagogy. This difficulty exists between disciplines within academia but, as alluded to earlier in this report, is significantly magnified when discourse crosses beyond academic disciplines into areas of educational practice, technology and management.

A frustrating aspect of the literature on educational technology and online learning is the seeming lack of connection between theory and practice in the dominant applied action research framework. Much of this research claims to be situated within a “framework” rather than testing any specific hypothesis deriving from a theory or theoretical perspective. In research on use of technology to enhance learning, it is important to have a plausible model of learning, a plausible model of teaching, and a clear articulation of the desired outcomes from our teaching practice.

The following list of questions illustrate some of the issues requiring closer examination.

- When we engage in educational / instructional design, is it appropriate to consider teaching and learning without having a position on the nature of knowledge representation and epistemology?
- Is it appropriate to consider the effect of “learning styles” or interface design on learning without a good understanding of cognitive processing, perceptual processing, memory and attention?

- In taking account of learning styles, are we aiming to build all modes of learning for each individual (work on areas of weakness as well as, or in preference to areas of strength) or are we focussed on relative fairness in terms of assessment (allowing everyone to focus on their areas of strength and hide their weaknesses)?
- In designing simulations or replacing practical classes with virtual projects, can learning outcomes be measured without a fairly comprehensive understanding of the whole process of learning?
- Which learning outcomes are relevant indicators of good teaching?
- Which learning outcomes are indicators of inherent student ability / skill? Are short-term learning outcomes or long-term learning outcomes the ones to focus on?
- Do our educational theories speak to which outcomes are relevant? Does our rhetoric on desired graduate attributes speak to what indicators should be important?

The list of questions above is by no means exhaustive. But by the same token, these questions are of little interest if examined without reference to a theoretical context. In the absence of a theoretical framework, there is no clarity about what might constitute valid data, and whatever data does emerge will provide little insight on anything other than the situation in which it was collected.

Convenience measures do not make for good science if they do not measure things relevant to a theoretical position. The fact that something has been measured does not substitute for a theory. Quantitative analyses and statistical differences between groups do not by themselves constitute good research if they are not theoretically grounded and do not form critical tests of specific hypotheses. The fact that a data set is compatible with a theoretical position is no great contribution to science if the same data set is compatible with a range of other theoretical positions, and a different data set from the same study would not have allowed rejection of any competing theories.

Educational technology research is not a discipline area by itself, but provides a potential context for data which speak to theoretical questions from core discipline areas such as cognitive science, social psychology and computer science. To reframe this contention from the perspective of educational technology, in order to provide a coherent research framework for the use of LMS specifically or educational technology in general, any research questions must relate back to core discipline areas rather than building an entirely self-referential data set around a single piece of technology or learning design.

*“... to put the point plainly and bluntly: experimental design in education is a shell game. The result from such scientific research depends more on the assumptions made by the researchers and analysts as on the actual empirical phenomena being studied. Indeed, the empirical results are themselves almost irrelevant; you may as well work with random data. And in practice, what we see is empirical research being used to obscure, rather than highlight, the theoretical or political presumptions informing the outcome.... Now let me be clear - all this is *not* to say that experimentation and empirical data play no role in science. Rather, it is to say that what counts as empirical evidence and experimental methodology is almost always determined from *within* a paradigm, and seldom ever adjudicates between them.”*

Stephen Downes <http://www.downes.ca/cgi-bin/page.cgi?post=21648>
last viewed 23/04/2006

In the following extract, Reeves et al. (2004) paint an enthusiastic picture of the potential of online learning.

“The vision of online collaborative learning is compelling. Learners, enrolled in a common unit of study for training, continuing professional development, or the pursuit of an academic degree, will work together online to solve complex problems and complete authentic tasks. Although they may never meet face-to-face, these highly motivated learners will form strong bonds that encompass productive teamwork, in-depth collaboration, and even lasting friendships. Through intensive engagement in the collaborative solution of authentic problems, the learning outcomes accomplished by these learners will be of the highest order, including improved problem-solving abilities, enhanced communications skills, continuing intellectual curiosity, and robust mental models of complex processes inherent to the performance contexts in which their new learning will be applied.”

Reeves et al., 2004

However there is a growing chorus of concern about the failure of elearning to deliver on its early promise. Reeves et al characterise it like this:

“Unfortunately, the reality of online collaborative learning is disappointing, at least in higher education ... There is little evidence that the developers of most online collaborative learning environments in postsecondary contexts have tried to reach, much less attained, the vision described above”

Reeves et al., 2004

Reeves et al. seem perplexed and disappointed at the failure to adopt innovative teaching and learning practices, and lament the apparent unwillingness or inability of the majority of academics to embrace the idea of transforming their courses into authentic task-based collaborative learning environments. They are nevertheless undeterred in their enthusiasm and in an interesting twist on the idea of “never let the data interfere with a good theory”, they view the gap between theory and practice as a failure to adapt practice to fit the theory.

“There is a huge gap between the theoretical ideal and the practical realisation of these innovative approaches, and effective models, principles, and guidelines are needed by faculty members, instructional designers, and academic administrators who are prepared to challenge the dominant teaching practices in higher education today.”

Reeves et al., 2004

They propose a to address the theory / practice divide through a model of “development research” which changes the mental models of researchers from those that are primarily experimental to those that are developmental, as per Figure 3 reproduced below from Reeves et al. (2004).

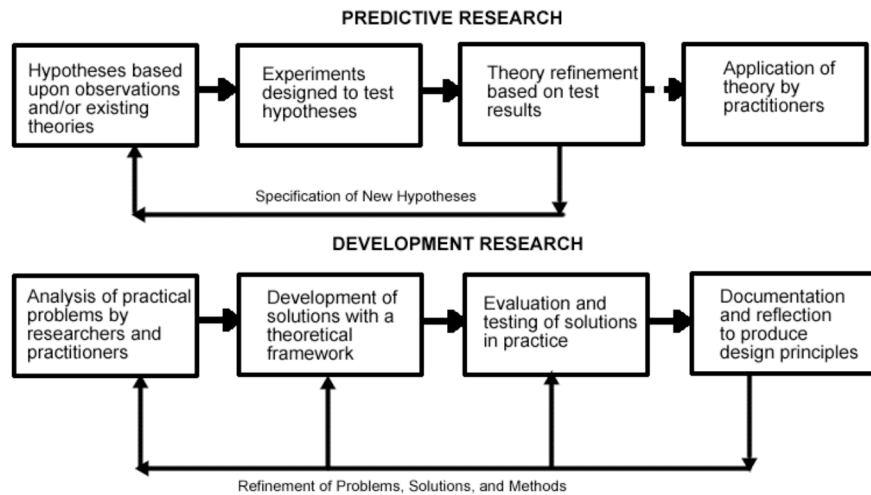


Figure 3: Predictive and Development Research compared. Reeves et al. (2004)

With this developmental research model in place, pedagogical innovation capitalising on the rich affordances of online learning environments will emerge through an iterative process of “successive approximation” or “evolutionary prototyping” of the ideal intervention. Academics from all areas can participate actively in research into the scholarship of teaching.

Perhaps a word of caution is appropriate at this point. In the world of theory, it is plausible to assert that we should aim to be the best we can in any endeavour we undertake, but in practice, we cannot simultaneously be experts at everything. Although most people (especially academics) are passionate about something, is it at all realistic to assume that all academics will be sufficiently passionate about new forms of teaching that they will seek to maximise the learning experience of their students by adopting new technology and feeding their experience back into the development research process. Although it is important to collate an evidence base to inform teaching practice, are academics in a position to evaluate their own teaching practice objectively? Might they be actually serving their students and their university better by keeping research and teaching in perspective and concentrating on maintaining the discipline expertise they have, and giving teaching the amount of time and effort required for it to be good rather than perfect?

Social constructivism

Educational theories which place emphasis on the social construction of knowledge require that an LMS provides the facility for social interaction. Within the course-based model dominating current LMS implementations, we must actively discover ways to ensure that students do not end up incarcerated within their enrolled courses. The types of on-campus interactions occurring outside lecture theatres, in libraries, in the Student Union, on the lawn must somehow be captured, but in a form relevant to the online environment. The paternalistic administrative model of many LMS implementations is equivalent to having students come on campus blind-folded, taking them only to their course-related activities, and not allowing them to see or speak to anyone not in their own course. The MyMonash portal, as the key entry point to the Monash

online environment, facilitates linkage between different online tools, obviating the requirement for the LMS to perform this function itself.

The LMS must be able to link to other online spaces that facilitate less formal, less structured, less “managed” interactions. Popular Web 2.0 environments such as services provided by Google, Yahoo, MySpace, Friendster, Flickr, eBay, Amazon, YouTube, and even iTunes store provide the model for informal social spaces for engagement. Community of practice sites such as CritiqueCircle.com (to share creative writing for peer review) and deviantART.com (to share artwork for peer review) demonstrate the possibilities for engaging online learning experiences outside the formal learning network. Sites such as Wikipedia demonstrate the possibilities for using online tools to create and share knowledge through self-managed open environments. The trick for universities may not be to try to create the same spaces within the confines of the university computer network, but rather to make sure that members of the university are able to forge links between their university identity and their other online learning communities. Community engagement in the age of Web 2.0 has the same basis as any traditional sense of community, but is conducted via a different medium (for an example look at the governance model of Wikipedia).

Influence of LMS on conceptions and practices of teaching and learning

As much of the conversation around online learning and LMS refers loosely to a social constructivist pedagogy, communities of practice and networks, we take some time to consider how these constructs fit within the university context and whether they can be supported by LMS implementation.

Flexibility and autonomy of communities of practice are not encouraged by LMS, which operate around formal structure rather than organic growth. The basic element of LMS architecture is the course (Melbourne: subject; Monash: unit) and there is little genuine opportunity for unstructured between-course communication and sharing. As Downes asserts:

"Probably the greatest misapplication of online community lies in the idea that it is an adjunct to, or following from, the creation and design of an online course.... the relation ought to be the other way around: that the course content (much less its organization and structure) ought to be subservient to the discussion, that the community is the primary unit of learning, and that the instruction and the learning resources are secondary, arising out of, and only because of, the community."

Stephen Downes, 2004 <http://www.downes.ca/me/publications.htm>
(last viewed 23/04/2006)

Of course it is possible to build a community of practice within an LMS, just as it is possible to ride a bicycle on a freeway, but the standard LMS architecture and roles do not encourage it. Even Moodle, specifically built around a social constructivist philosophy, does not easily support communities of practice except within a course-related metaphor. This is not a criticism of Moodle, since it was designed to support online delivery of courses. It is a criticism of the way in which social constructivist pedagogies and online learning have been conceptually conjoined with no basis. Social constructivist learning does not require technology, and does not emerge directly from use of online environments. Educational technology is agnostic with respect to pedagogy,

and can support the most didactic teaching methods – in fact, the more didactic it is, the easier it is to support.

LMS, learning networks, communities of practice and control

The link between LMS, learning networks, and communities of practice, despite the upbeat marketing rhetoric of vendors such as Blackboard, is by-and-large one of ‘guilt by association’. Both terms are closely associated with the term ‘online learning’. Adding to the chain of association, Laurillard posits the centrality of learning networks and communities of practice in the supposed “new pedagogy”. She proposes elearning as a medium of communication which creates loosely defined social learning networks. These learning networks acquire the emergent properties of adaptive “intelligent” networks (also called learning networks, but in a different domain) through similarity in terminology more than through carefully constructed analogy.

“E-learning enables academics and students to communicate through networks of communities of practice in the cybernetic approach that makes change and innovation an inherent property of the system. At the same time, we need a way of creating the common infrastructure of agreed standards of interoperability that enable, and do not frustrate innovation.”

Laurillard, 2006 (underlining added)

Dynamic, adaptive, self-organising networks have been described in the artificial intelligence and cognitive neuroscience domain and may provide appropriate models for exploring knowledge representation and governance from a cybernetic epistemological stance as will be discussed further below. The adaptive, self-organising cybernetic properties of social networks are based around the idea that humans themselves form the integrative nodes of such networks. However the ‘*common infrastructure of agreed standards of interoperability*’ invoked by Laurillard presumably refer to internet protocols that allow software agents to interoperate rather than to interactions between people. The fact that social networks communicate via computer networks does not entail any formal mapping of network architecture between the social and computer domains although one, both or neither could behave as self-organising and adaptive networks in any number of possible predetermined or emergent mappings.

The juxtaposition of like terminology across domains is not a strong argument for the claim that social learning networks will inherently acquire adaptive “cybernetic” properties. It does *not* mean that substantive change and innovation will be inherent properties of any learning network. The essence of an adaptive system is that it *responds* to change and innovation, but this is not the same as initiating it. In complex systems, the source, direction and value of changes are hard to predict. The issue of how reciprocal interactions between different hierarchical levels of governance could be structured to support the injection of “good” change while ensuring protection from “bad” has not been addressed by Laurillard.

Geoghegan and Pangaro (2004) fill the void with a clear articulation of organisational governance within a cybernetic network. They describe the way in which an organisation can ‘learn in order to remain viable in a changing environment’ using Ashby’s formal description of the necessary and sufficient conditions for a system to act ‘like a brain’:

“All organisations seek to successfully carry out transactions that achieve their goals and assert their identity, whether to educate college students for employment, to govern a territory fairly, or to make money for shareholders. An organisations’s transactions are predicated on agreements, and agreements in turn are based on conversations in a shared language. Thus human organisations are delimited by their operation in the domain of language, and Ashby’s ‘essential variables’ are the ‘shared truths’ of an organisation – perturbed by the environment, regulated by employees’ actions, and carried in its language

... corporations create ‘comparators’ in the form of people and processes that interpret market fluctuations against monetary and strategic goals (whether qualitative or quantitative). These goals are perforce expressed in linguistic distinctions held as internally relevant. Thanks to Ashby, we can describe the limits of what is not possible under current constraints of an organisation’s language, and therefore to focus on changes that are required to operate beyond current limits.

... The vast literature of ‘organisational design’ and ‘learning organisations’ is usually descriptive instead of prescriptive. Some implications of the role of language are not palatable to most modern organisational experts and their executive clients because it is in their self-interest to lionize the importance of individuals as the means to achieve success (‘cult of the CEO’ and ‘leadership awards’). A cybernetic approach to organisational design instead emphasises the requirements for a social system as a whole to support sub-systems that recognise and reward different types of creativity in three phases of change: invention, discovery, and efficiency-making.”

Geoghegan and Pangaro, 2004

It is important to note in the context this report that self-organising adaptive network models sit uneasily within the governance framework for LMS, because LMS are inherently structured around a command-and-control governance mentality and are not dynamically adaptable. It is difficult to see how centralised LMS services could support self-organising communities of practice and learning networks and their associated highly adaptive and flexible governance structures whereas Elearning 2.0 is uniquely adapted to learning network concepts.

The social constructivist pedagogical mantra of many online learning experts is hard to reconcile with the implicit “command and control” mentality underpinning educational design and LMS. The apparent lack of awareness of this glaring theoretical inconsistency is worrying but sheds light on the gulf of (mis)understanding between concepts of web and Web 2.0, traditional online learning and Elearning 2.0.

Elearning 2.0

The dominant grammar of Web 2.0 is based around active verbs rather than the passive nouns of the traditional Web. The shift from a passive consumer perspective to that of an active participant is hidden in subtle linguistic nuance. Key words like ‘interactive’, ‘transformational’, ‘hyperlink’, ‘engagement’, ‘student-centred’, ‘discovery-based’ have been used frequently in traditional discourse about online learning, but in Elearning 2.0, the interactions relate to the whole web rather than to controlled learning experiences. More importantly, interactions are inherently bi-directional and the implicit concept of centralised control is completely relinquished. Educational designers who have urged student-centred learning in which students take responsibility for constructing their own knowledge are now faced with an embarrassing largesse of accessible content, freely available tools to interact with it, and freely available tools to create more of it! Moreover, they are faced with the possibility that their mediation in the process of building online learning spaces is no longer required. Is this their pedagogical nirvana, or their worst nightmare? If it is the latter, perhaps it is time to revisit the pedagogical arguments for the need to transform outdated university teaching and learning practice to embrace the new technologies of the 21st century.

Once we begin to question the pedagogical underpinnings of LMS and multimedia content delivery, not only does the contested nature of the domain emerge clearly, but issues relating to LMS governance become more and more slippery. Elearning 2.0 is the emerging theme in discussions on the future of online learning environments. Elearning 2.0 is based around open access, interactivity, creativity and sharing. Elearning 2.0 is inherently not LMS focussed because LMS implies controlled delivery of approved content and communication channels to enrolled students. Thus the question of LMS governance becomes a peripheral issue in implementation of Elearning 2.0 environments. Indeed, governance itself is a less pertinent construct in the network-centric services-based environment of Web 2.0. The Web 2.0 world is self-governed and can be modelled as a self-organising, adaptive network. Organisational structure emerges through “market rules” determined by software brokering agents which have their own rules of engagement embedded within them. Each intelligent agent knows what sort of transactions it can participate in and which agents it can interact with, generating a self-regulating free market. Power and value are emergent properties deriving from the nature of trading relationships negotiated in that market. De facto governance structures are by-products of trading relationships rather than invoked centrally. Changes to de facto governance structures are achieved by deliberate manipulation of, or emergent modification to perceived value of trade. Clearly Web 2.0 agents have people and organisations behind them determining these values, and much of the “web economy” will be influenced by non-web market forces. But despite the best efforts of external would-be regulators, the actual governance structures on the web are emergent properties of a complex and dynamic set of interactions rather than the result of enforceable external legislation.

Scott Wilson (2006) has provided an impressive proof-of-concept mapping for a Elearning 2.0 Virtual Learning Environment based around online tools and protocols that are already currently available.

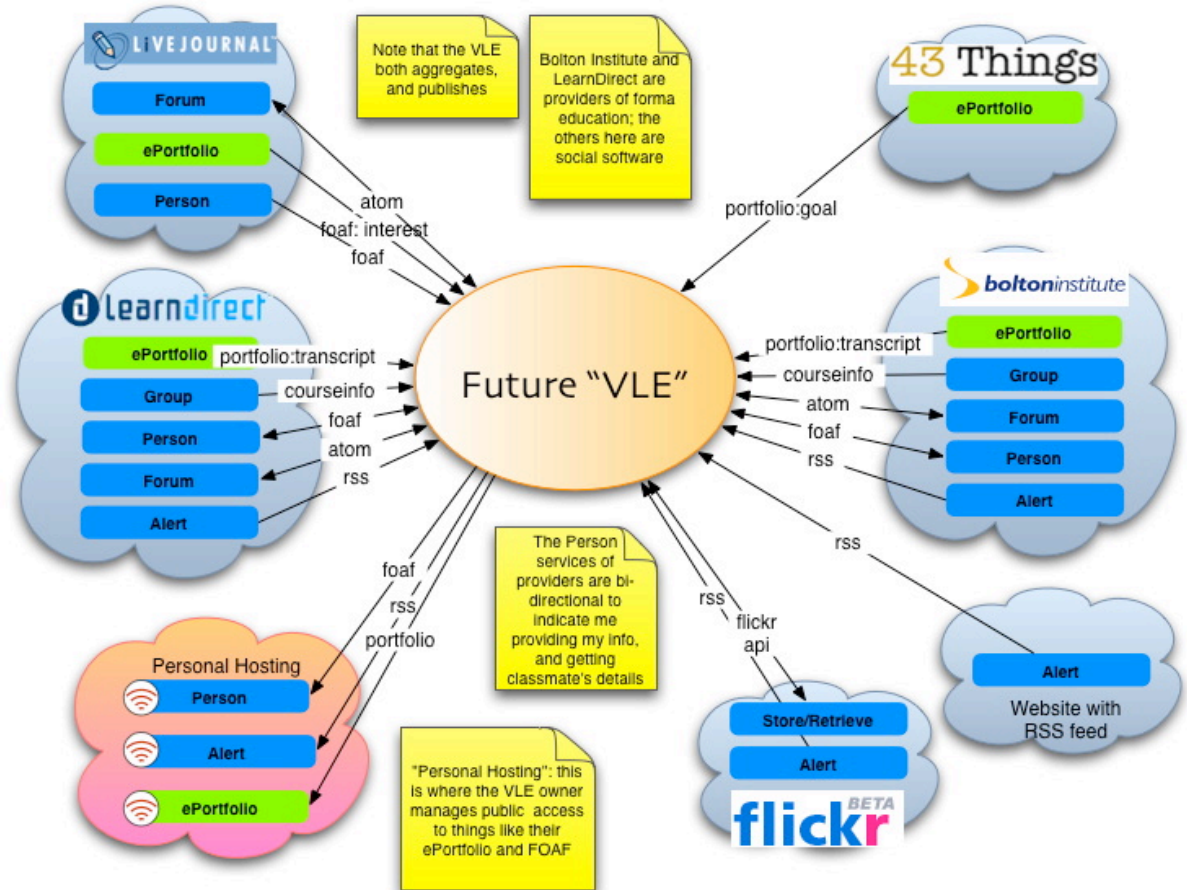


Figure 4. Future “Virtual Learning Environment” using existing Web 2.0 services. From Wilson (2006).

The architecture of Elearning 2.0 has been conceptualised by Downes (2006) in the following way based around protocols relating to resource profiles, resource production, resource repositories, resource syndication from repositories, resource aggregation and digital rights management (in the form of credit for ownership)

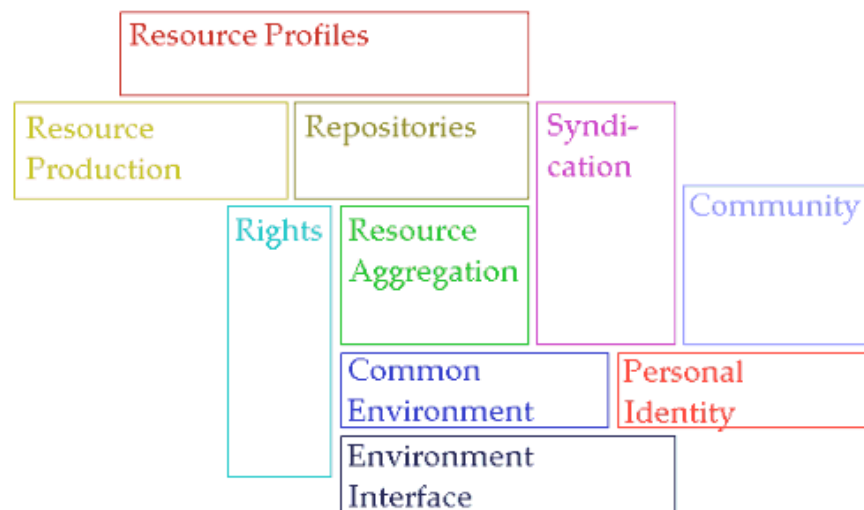


Figure 5. Model for Elearning 2.0. From Downes (2006)

Downes (2006) suggests four criteria to use to determine whether new educational technology belongs to the interactive Elearning 2.0 framework or to the traditional content-based web.

1. **Autonomy**

Does it allow people using the technology to be autonomous? Can they make their own decisions, configure their own environment, user their own services, create and structure their own content?

2. **Dependence**

Does it force people to use a particular software program, a specific data format, a particular resource provider?

3. **Diversity** (of the technological rather than socio-economic variety)

Does it allow the use of different programming languages? Can people use different types of computers and devices to access content (eg iPods, desktops, phones)?

4. **Openness**

Can anyone add content to the system? Is content provision restricted to a privileged few? Can anyone get content from the system or do you need to be a subscriber? Does it help people communicate with each other?

Open protocols, long with flexibility and autonomy of access and use are extremely difficult to integrate with, or not compatible with, a highly structured top-down governance framework.

Learning content and commercialisation

Downes (2006) contends that the internet is no longer about consumption of content, but is about interactions with a community. Learning content after “the age of content” begins to look more like the pixels in an image, the pieces of information from which you construct a picture of the something. Learning content is scattered all over the web in the form of user-generated content that is pulled together dynamically as you need it. Web 2.0 is a production medium rather than a purely a broadcast medium, and the content produced doesn’t have

to be really good content, or “best practice”: it just has to be “good enough”. As availability of content goes up, the value of content is diminishing and can only be maintained by creating artificial shortages as happens through copyright and restricted distribution.

“People will produce content whether or not they get paid for it – the online evidence for this is overwhelming (viz. more than two billion free web pages, or more succinctly, the content of wikipedia).

Stephen Downes (2004)

Downes argues that, while free online content can act as a loss-leader for the provision of other services, it does not pay for itself – the cost of producing online educational content is unlikely to be recouped by selling it. The only way to raise the price of online content significantly is to severely restrict the supply. This restriction of supply occurs when LMS vendors sign “exclusive deals” with publishing companies and is further compounded when lock universities their course content inside an LMS available only to enrolled, fee-paying students. Downes asserts that people will only pay for online learning content if (a) it’s the only material available on the subject and / or (b) they need it.

The real cost of producing online educational content is way beyond the capacity of “the market” to pay and there are five possible solutions to this problem:

- “(1) You can lower your production costs by employing content authoring tools, reusable learning objects, and low paid (graduate student) labour. But that impacts on the quality of what you offer.*
- (2) You can dramatically increase the production of courses. This means lowering production costs. And even then, you probably won’t be able to lower production costs enough.*
- (3) You can get a million students (if you’re the Open University or the University of Phoenix) per course.*
- (4) You can create higher value content, content so good and so unique that other people will have to pay for it. But fair warning: it had better be really good – better than MIT’s, which is already online for free.*
- (4) Or you can give up on the dream of making money from content and get back to your real job, providing an education. Your content will get people in the door. And it will make your job of providing a service easier. Cheaper for students, But it won’t pay the bills.”*

Stephen Downes (2004)

Any significant change of emphasis away from content production and content management implicit in Elearning 2.0 has significant implications for LMS and LMS governance, but decisions relating to content management, copyright and digital rights management are far broader in scope than LMS, and will need to be addressed elsewhere in the university governance structure.

Transformational pedagogy, organisational language and the capacity for change

Most of the contested domains we have referred to so far in this report are amplified by the fact that they share terminology at the surface level which does not translate to shared understanding at the deep level – ie they use the same terminology to mean different things. Without shared language, it becomes very difficult to communicate effectively and resolve differences in perspective.

The central role of language in defining an organisation and its capacity for change is further clarified by Geoghegan in this way:

“an organization’s language is critically important. It becomes more than simply a means for communication. It becomes a field for action, and a way of constructing truth. It becomes the basis for all transactions, the basis for all business.

... The organization’s internal language is designed to help managers facilitate present-day business—not look beyond it. Using the internal language, managers increase efficiencies, but cannot recognize new fields of research, new discoveries, new approaches.

Like all of us, they cannot recognize their own limitations. Constrained by the previously successful language, we do not know that we do not know. Consequently, we think we know—and thus cannot learn. Developed as a tool to increase efficiencies, the organization’s language, paradoxically, becomes a trap.

The conversations necessary for creating fundamental change do not come naturally. They pose questions that cannot be understood in the organization’s present language. The conversations necessary for generating new opportunities come from outside the system. Their language has a different history. It is often technically and intellectually demanding. Consequently, it is often dismissed.”

Geoghegan et al., 2002

The seriousness of the language issue rests on the fact that distinctions between the web and Web 2.0, elearning and Elearning 2.0 and the location of LMS in this context are obscured by a seemingly shared language that is, in fact, incongruent. The different use of language may appear to rest on trivial differences, but instead represents a fundamental conceptual difference between (a) Elearning 2.0 practice around dynamic, interactive, adaptive, networked, online learning environments as infrastructure and (b) traditional elearning practice around static multimedia resources as content to be delivered online via an LMS, CMS or portal.

Organisational truth

Foucault has postulated that:

“Each society has its regime of truth, its general politics of truth; that is, the types of discourse which it accepts and makes function as true”

Foucault, 1975

Each university has evolved to perform in a particular way and is highly resistant to change precisely because it is optimised for its current behaviour (irrespective of whether that behaviour is optimal for the organisation’s stated aims). The way it behaves becomes its organisational truth. By aiming to

transform part of the core business of the university (teaching and learning), we are in effect challenging a cornerstone of the organisation's concept of truth.

Like Geoghegan, we lean towards the idea that language mediates this regime of truth and therefore language and communication are key factors in the evolution of "organisational truth". The evolution of new language to express the new regime of truth is required for implementing change but there must be a way to bridge between the old and the new to reduce the stress to the organisation in terms of time, attention and energy associated with change ("biostress") (Geoghegan and Pangaro, 2004).

Geoghegan and Pangaro (Geoghegan et al., 2002) adopt a cybernetic approach to conceptualising organisations based on the idea that organisations are essentially biological systems.

"To support an organization's future viability, effective decision makers actively introduce change into the system. They do so by generating new language that appropriate groups in the organization come to understand and embrace. This new language does not overtly challenge the pre-existing, efficient system, but rather creates new distinctions and supportive relationships. In this way, decision makers act as interlocutors and incubators of systemic change.

... When clarity and validity of purpose exist within the organization, the feeling of ambiguity decreases. Stress and cost to the system are lowered. Uncertainty is reduced. Those working in the system perceive an expansion of personal potential and increased security. As they become aware of opportunities for growth, they participate more openly in the system. Feedback increases."

Geoghegan et al., 2002

They go on to make a crucial distinction between leadership and management, one that goes right to the heart of a heavily contested domain in academia.

"Leaders reduce uncertainty, give clear and meaningful messages, and provide opportunities to act in ways that cannot easily be misinterpreted. Managers understand the organization's past behavior. But this knowledge, and the language that accompanies it, limit their vision of the organization's potential future state. Using the language of the past, managers may try to provide a vision for the future. But it is an old future—a memory of what the future could be. Managers may strive for fundamental change, but their language prevents them from achieving it.

... For an organization to creatively conserve its capital, it must regenerate itself continually— by creating new language; by recognizing and reinvesting in invention, discovery, and efficiency; and by reinvesting in its potential to co-evolve." Geoghegan et al., 2002

The creation of new language and the recognition and reinvestment in invention has long been the protected preserve of academics. This creative process is inherently inefficient. Managerial efficiency can only be injected into the picture once a creative process has become "mainstream", ie is no longer innovatively creative.

How does an organisation achieve the appropriate balance between creativity and managerialism while surviving through the regeneration process? And is it

possible to do this while conserving resources, minimising anxiety and personal stress, thereby leading to the creative conservation of capital?

Although LMS and elearning were supposed to have transformed university teaching practice, perhaps the biggest transformational challenge for universities relates to the changing value of content. In a world where content is cheap but understanding and organising content is expensive, organisations would do well to place value in expertise rather than reusable / disposable content. Although universities have shown considerable interest in open access publishing, it seems that most have not yet caught on to the futility of trying to protect and / or sell content that is increasingly irrelevant.

Regenerative change

An organisation that can change itself to adapt to new circumstances is a learning organisation. Geoghegan and Pangaro (2004) conceptualise the nature of organisational regenerative change as a simple biological process. They suggest three methods to achieve change:

- (1) the Machiavellian approach of “kill the prince and talkers” (change the people in power) to change the truth (high biocost for the organisation);
- (2) find a visionary leader, the “philosopher prince”, who can bring about the mutation or change by leading the entire strategic discussion from his existing position (lower biocost but rare to find such a leader); and
- (3) change by design by actively creating a new language to leverage a new semantic space.

It should be noted that the Growing Esteem process at the University of Melbourne (<http://growingesteem.unimelb.edu.au/> last viewed 24/04/2006) offers an excellent example of stimulating the types of conversations within an organisation that may lead to a shared language for a new way forward, ie a form of regenerative change. It is not clear whether this constitutes an example of change mediated by a visionary leader directing the conversations (type 2 above), or regenerative change by design (type 3 above), where the organisation can change by virtue of understanding the opening of a new semantic space, focussing on the potential of that new space, and developing new distinctions in language such that the new truth becomes communicable (Geoghegan and Pangaro, 2004). The Growing Esteem project demonstrates top-down initiation of a strategy for change which has seeded bottom-up emergent patterns of input which were captured in project submissions. The project used simple but effective processes to capture enormous complexity.

Which ever type of change it is, it demonstrates clearly that challenging conversations across all levels of the university can be sustained with the aim of forging a new way forward for the organisation. These conversations facilitate the development of a new language of discourse to allow for regeneration but one which maintains respect for the past organisational history to minimise the biocost of change.

Business models for university management

There is an extensive literature on the impact of business models and corporate governance frameworks within the university sector. Despite widespread concern about the lack of appropriate fit between business models and academia, university governance has taken on a strongly managerial perspective. Amid strong financial pressure from decreased government funding to tertiary institutions, vision statements, mission statements, strategic plans, operational plans and quality audits abound. All that can be measured, along with much that cannot but is being measured anyway, is being scrutinised in acute detail to try to give institutions an edge in securing additional funds. Meanwhile, things to which no measure has been applied, are, as a consequence, largely ignored. Since many of the things that can now be measured derive from implementation of information and communication technology solutions which are not well-understood at the technical level, there is a confounding of the technical capability to measure with the ability to interpret the meaning of the measurement.

Within this context, proliferation in the availability of information with a concomitant decrease in the ability to organise that information into coherent knowledge, means that decision-making in the university sector is increasingly influenced by technocratic and bureaucratic factors that are not adequately understood or contested. Significant aspects of university operation are undertaken through informal networks or backchannels, and these have been overlooked by business models based around formal structure and efficiency. Things that do not fit the formal structure are effectively “under the radar” for the organisation. Universities as organisations are to all intents and purposes “flying by instrument” for reasons of efficiency. Occasional checks on direction involve checking radar screens rather than looking out windows such that autopilot rather than manual control is the preferred piloting technique. The instrument or radar view has become the version of reality accepted by management, although the degree of fit is to a greater or lesser degree contested.

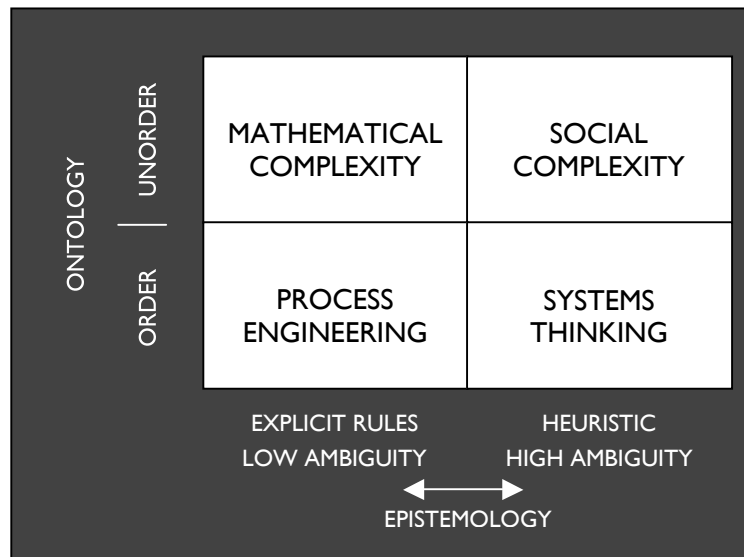


Figure 2. (Repeated) Multiple-ontology taxonomy. From Snowden (2005).

Multi-ontology sense-making

As mentioned earlier in the report, Snowden (2005) has developed a multi-ontology sense-making model of organisational decision-making space based on a two by two matrix contrasting the nature of systems (ontology) with the nature of the way we know things (epistemology).

Within the ontological dimension, ordered systems have clearly identifiable relationships between cause and effect (rules) which allow predictability of future events. In unordered systems, there are too many agents and too many potential interactions to allow predictable outcome-based models. According to Snowden, in unordered systems, although outcomes are not predictable except in the most general sense, it is possible to control initial conditions and monitor for emergence. While order and disorder are construed as disjoint domains, the orthogonal plane of epistemology is viewed as a continuum from low ambiguity rules that can be made explicit to high ambiguity heuristics which act as guiding principles or implicit rules-of-thumb.

The business models which dominate current university management sit in the lower quadrant of the model (ordered ontology and rule-based epistemology), whereas the collegial model of academic management sits in the upper quadrant (unordered ontology and heuristic-based epistemology). The benefit of conceptualising decision-making within this framework is that it draws attention to the consequences of mismatched models: if you apply a model that is inherently ordered and rule-based to a system which is inherently unordered and heuristic, it is not surprising that there are problems with alignment and fit. It is inevitable that some things will fall outside “the rules” if the underlying organisation is not rule-based.

So long as most things behave *as if* the proposed rule-set applies (often expressed as the 80-20 rule), a simple rule-set can be organisationally efficient, even with the added cost of exception handling. However any attempt to force genuine outliers into the rule-set is ill-conceived when the rule-set does not actually describe the underlying reality. Willing suspension of disbelief is a requirement of knowingly applying simple models to inherently complex systems, and the informal network concepts of “old boys’ networks”, “hidden agenda” and “hidden curriculum”, communication systems which fall outside “the proper channels”, are familiar to most people.

Governance models can be viewed as *a working hypothesis* of organisational structure (bottom up view), the management’s simple rule-base extracted from the observed operation of university. If it is accepted that the organisation is, in reality, an unordered system operating in a highly ambiguous heuristic mode with formal and informal communication channels, governance structures can be adapted flexibly and “organically” to extract appropriate meaning from ambiguity. However, if governance models are viewed as *defining the organisational structure* (top down view), much wasted effort will be expended in trying to align that which is inherently non-aligned.

LMS governance, under this formulation, is the organisation’s working theory for operations and processes relating to teaching practice. LMS governance issues are indicative of things which fall outside the organisation’s

understanding of its own practice. Solutions to governance issues when viewed from the bottom-up perspective would involve exploring informal channels and modifying governance processes to fit actual practice, whereas when viewed from the top-down perspective, would involve shoe-horning the actual practice to fit the ideal imposed by the governance model.

We wanted to capture the potentially transformational capacity of LMS in contested domains across a perceived digital divide: to look at the unordered complexity relating to informal communication networks and hidden organisational structure within university teaching and learning practice. In view of this aim, and given the short time-frame available for this project, we chose to adopt a hybrid methodological approach incorporating informal conversations, semi-structured interviews, extensive literature review and focussed observation. As both Melbourne and Monash aspire to research-led teaching and evidence-based practice, we felt it was important to explore informal “hidden” networks as part of the evidence base informing teaching practice. These informal networks are an integral part of the richness and complexity of academic life and need to be understood and embraced within the context of a learning organisation, rather than ostracised, forcibly assimilated or exterminated.

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Appendix 1: Project management heuristics

IT project management methodology situates software systems in a process-oriented system model. As IT systems move to enterprise level architecture, system models become more ambiguous. Individual enterprise software systems can model a particular view of the organisation through a ruleset appropriate for their context without having to deal with the multiplicity of social complexities in other parts of the organisation. However when systems share organisational data from their own simplified contextual view as if the information is representative of the broader organisational context, ambiguities can be amplified rather than reduced. Social complexities inherent in enterprise software projects are not well handled by rigid application of project management process.

The principles underlying project management methodology, if taken as guidance rather than gospel, can become a general recipe to ensure that common sense prevails. The following heuristics assume that **competent managers will be able to act flexibly and autonomously in decision-making and risk evaluation** and will **use their experience and judgement** to deal with the inevitable ambiguity and complexity arising in organisational settings.

Twelve common-sense heuristics for enterprise project management in complex organisational settings

Have unequivocal senior management support throughout the project

Ensure unequivocal support from senior management before an IT project begins and insist on commitment throughout the project. Use senior management support to obtain support down the chain of command. “Organisational doubt” is contagious and can destroy an otherwise successful project. Senior management should trust their project managers to manage projects, but should ensure that accountability is built into the project management framework.

Establish who is responsible for each project decision then support them to make it

Give people the appropriate authority and autonomy to make decisions they need to make in order to do their job. Give them the time and resources to implement these decisions. Ensure that decisions are documented and their ramifications communicated. Ensure that people are accountable for the outcome of decisions for which they are responsible. Don't micro-manage everything, or make people responsible for things over which they have no control.

Make clear communication a high priority.

Use formal and informal communication channels and ensure that information flow is multi-directional. Ensure that formal channels are used for formal communications and understand the protocols for such communication. Nurture informal communication networks and understand how they function. Tolerate redundancy, uncertainty and cultural differences inherent in the social complexity of organisations. Communicate bad news openly and absorb the inevitable backlash. People are surprisingly forgiving if they are treated with respect. Manage expectations by open communication and access to relevant documents. Ensure project documentation is concise enough to be maintained otherwise it will be of little use. Spin is acceptable for marketing, but not for project reporting.

Don't ask for input unless you are prepared to listen to it.

Get input from ‘optimists’, ‘realists’ and ‘pessimists’ who will be affected by the project. Do not assume that outside consulting firms understand an organisational context better than the people who work in the organisation itself. If people take time to provide input, but it is not used at all, not only has their time been wasted, but they are likely to be sceptical and unmotivated next time they are asked for input. Issues raised but not addressed may not be raised again, but instead become a source of latent discontent.

Aim for good practice not best practice

Keep a realistic perspective on quality - trying to implement a perfect IT system can result in perpetual delays. Determine showstoppers; determine mission critical functionality; establish minimum acceptance thresholds; make a “go | no go” decision based on acceptance thresholds; then just do it! Good is good enough when people want a service and the alternative is nothing at all. Upgrades to services must provide some additional benefit over and above the current service to warrant the organisational cost of change. Old systems are not necessarily bad systems if they perform a required function effectively and can be appropriately maintained.

Push system integration to the limit but not beyond

Identify canonical data sources for enterprise information and get the information from those sources. Where no canonical data sources are available, get whatever valid information can be sourced. Do not be afraid to use manual data entry and manual exception handling where information is difficult to interpret or rules are ambiguous. Use the project as a catalyst for process improvement but bear in mind that some systems are deliberately ‘inefficient’ to allow flexibility and cross-checking of input.

Ensure the implementation plan for a project is shorter than the software upgrade cycle

Most enterprise software is upgraded on a regular basis and implementation plans need to take this into account. The pilot phase should not be longer than the software upgrade cycle of the product being implemented. Large-scale pilots amplify the need for attention to expectation management and accurate communication of service status. The pilot phase of a project is often a production service to people testing it, and the communication aspects of a service should also be piloted.

Put data management, backup and archiving in perspective

Determine which data are critical and make sure they are backed up appropriately. Determine which functionality is critical and make sure there are business continuity plans in place to restore functionality if required. Remember that not all data needs to be saved and the organisational importance of data is not necessarily related to the time it took to create it. Archive on a “best effort” model, but ensure that the formal responsibility for data and content management stays with the content owners. Understand the granularity of content being backed up to ensure that restoration at an appropriate level of granularity can be realistically achieved. Recognise the most common forms of restoration requests and ensure appropriate expectation management with respect to timeframes and possibilities.

Don't train people until you know what problem you are solving.

If an enterprise software system that is supposed to improve overall organisational efficiency requires all users in the organisation to undergo

extensive formal training, the software has not been well designed or there must be clear and strategic or productivity benefits after taking into account the real training costs. Before implementing a training program, understand the problems people are having and identify whether it is a problem with their task-related skills, the software interface, the underlying software system, the underlying organisational system, or a mismatch between the software system and its context of use. Train people as a last resort rather than the first option.

Protect against burnout.

Many areas implicitly measure staff enthusiasm and dedication by the number of hours people work each day. When people work long hours without complaint, do not make their reward an expectation that they will work even longer hours. There are times when employees have to work around the clock to get critical projects done. Do not exploit goodwill and passion for a project. If working long hours all the time becomes part of the organisational culture, it will lead to waste, inefficiency and ill health.

Focus on the work people do, not how or when they do it.

Some positions require people to be at their desk during specific hours to answer customer calls or to participate in meetings. Others can do their work from home, or can work flexible hours, early in the morning, late in the evening. Good managers build accountability into flexible work plans and manage performance accordingly. Encourage trust and respect by showing trust and respect towards employees.

Don't spend millions of dollars to try and change your culture.

Organisational culture cannot be manufactured. No amount of strategic realignment, training programs, pep talks, or award schemes will affect the organisational culture if the senior management don't practice what they preach. The fastest changes in organisational culture occur when senior management themselves adopt the culture they want in the organisation and communicate the expectation that others will follow suit. Reinforce expectations appropriately from senior levels down rather than the other way around. Make it as easy as possible to do the right thing, and as difficult as possible to do the wrong thing and use common sense in applying sanctions.

Appendix 2: Student engagement and LMS

According to Kerri-Lee Krause (2005), student engagement refers to “*the time, energy and resources students devote to activities designed to enhance learning at university. These activities typically range from a simple measure of time spent on campus or studying, to in- and out-of-class learning experiences that connect students to their peers in educationally purposeful and meaningful ways.*” (p 3). Krause encourages us to take a broader view of engagement and developed ten principles for enhancing student engagement. Below we discuss the impact of LMS and other online services on the ability to operate by those principles. We also discuss how other online services might contribute to informal learning opportunities that are critical to active engagement with a body of knowledge through a learning community or network.

(1) Create and maintain a stimulating intellectual environment

This working principle is about providing good reasons for students to be part of a learning community, providing coherent course structures, and stimulating interaction through discussion, debate, exploration and discovery. An LMS can clearly provide course structure and provides course tools that can be used to promote interaction. Whether or not the environment is stimulating intellectually relates more to the content and structure than to the use of online technology.

(2) Value academic work and high standards

An LMS can be used to monitor time spent on various activities. Such monitoring can be used to gain insight into the way students are spending their time. This information can then inform academic staff on whether they need to encourage further commitment to study, or emphasise balance in activities. LMS self assessment tools, peer rating tools and gradebook functions can be used to provide timely feedback and evaluation to students about their academic progress.

(3) Monitor and respond to demographic subgroup differences and their impact on engagement

When communication takes place through the LMS, academic staff are able to monitor student interactions much more flexibly than in face-to-face situations because most interactions are recorded. Although there are privacy and ethical issues involved in how closely student activity is monitored and by whom, there are clear opportunities in the online situation to observe whether demographic subgroups exist, whether they are engaged, and to provide assistance or encouragement when necessary. Communication spaces and specialist resources, including additional courses, can be provided through the LMS for particular subgroups where required. In some circumstances, conditional release functionality for LMS resources and activity may assist in identifying and responding to subgroups in a timely manner.

The ability for students to subscribe via RSS feeds to resources relevant to them allows subgroups to self-identify and help themselves, rather than needing to go through an intermediary.

(4) Ensure expectations are explicit and responsive

An advantage of LMS is that expectations of staff and students are can easily be made available for information and review. Announcements, noticeboards and course documents can be made obvious. Discussion forums allow all students in

a cohort to see the questions and answers from their fellow students. It is also possible to monitor staff responses to ensure consistency in communication, which is especially useful in subjects with large student numbers distributed over different lecture, tutorial and practical streams with different teaching staff. The choice of “push” or “pull” and of communication medium for receiving required information can be made available to students while keeping the onus on them to keep up to date. For example, announcements and discussion posts might be viewed by logging into the LMS, by aggregating feeds into a preferred newsreader, by subscribing to email, SMS or pager alerts, or all of the above.

(5) Foster social connections

An LMS provides tools to foster social connections. However it is important to note that (a) providing tools is necessary but not sufficient for social connections to form and (b) the *formal learning framework* may not be the appropriate place to encourage social connection. Discussion forums and chat rooms need to be facilitated and there should be clear guidelines about appropriate etiquette in different online spaces. It is not conducive to formal learning for course related discussion to be heavily interspersed with irrelevant chatter, so long as there is some avenue for chatter to take place. Teaching staff should be aware that many students already engage online using freely available web tools and social connections and learning networks formed initially through the LMS may move outside to this free space in the ‘virtual’ world in the same way as study groups which begin in the library may move to cafes and open spaces in the ‘real’ world. If social forums are implemented within LMS, they should remain social but make sure that these spaces are patrolled at the sort of level that would be considered appropriate in a real-world student lounge hosted for the same student demographic. Not all students wish to be engaged socially with their class mates, and this should also be treated as a perfectly acceptable choice to make.

(6) Acknowledge the challenges

An LMS can be used to provide resources to support students who are struggling with competing pressures. The apparent anonymity of resource usage may make some students more comfortable acknowledging they are being challenged. On the other hand, the ability to monitor who is using resources will allow staff to understand more fully the degree of pressure faced by their students. This tension between support and interference has always been a challenge in the pastoral care aspect of teaching and learning. Discussion forums can be used to allow pressures and challenges to be expressed.

(7) Provide targeted self-management strategies

LMS tools such as calendar and event management, task lists, self assessment tasks, assignment submission tools, announcement feeds etc are particularly suited to support self-management of study and other aspects of university life. The integration of enrolment capabilities, library borrowing information, ePortfolios, print-on-demand, book purchases and fee payment for a variety of services would add to the usefulness of the LMS. These value-added services allow the LMS to become a central tool through which a student engages with the administrative aspects of the university, but it becomes more like a portal than an LMS per se.

(8) Use assessment to shape the student experience and encourage engagement

LMS provides a number of tools for self-assessment. Of course, use of these tools should be governed by appropriate pedagogical principles and it is the pedagogy rather than the assessment tool per se that will encourage engagement. Use of assessment to shape experience is framed in Skinnerian operant conditioning terminology that provides an interesting contrast to the usual social constructivist pedagogical frame.

(9) Manage online learning experiences with care

The tools provided by an LMS can have a positive impact on all the working principles governing student engagement, although much of it relates to administrative and social rather than pedagogical engagement. Use of the LMS will not encourage engagement if the online environment is not constructed engagingly. Engagement is with people and resources and LMS is the substrate for engagement, not the engagement itself. Student engagement is often based around informal learning experiences: the essence of informal experiences is that they are *not* managed. Environments capable of supporting informal learning experiences are necessary but not sufficient for them to occur.

(10) Recognise the complex nature of engagement in your policy and practice

Analysis of data from LMS, which tracks user interaction with content, tools and other users, will allow further insight into the nature of engagement. Unfortunately, far from creating innovative possibilities for communication, the most likely impact of LMS in the age of Web 2.0 is to restrict and control the ease of online communication rather than facilitate it.

Reference

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Appendix 3: Annotated Bibliography

This bibliography is being constructed in a wiki which may form the initial framework around which an online community of practice could build. The ISBN/ISSN number is listed for books and journal articles to allow online searches of a range of libraries and bookstores as is implemented at wikipedia. The URLs are listed in the printout but are implemented as live links on the wiki.

The ISBN links in this bibliography go to Wikipedia's site for sourcing books. This page takes the ISBN number and lists a vast array of book suppliers and libraries worldwide. There is a quicklinks menu on the right hand side of the Wikipedia site for Libraries > Australia which allows you to look at the University library catalogues.

The following bibliography is captured from the site under development at <http://www.mdhsonline.unimelb.edu.au/mediawiki/>

Contents

- 1) Melbourne / Monash Reports, Minutes, Websites etc
- 2) Models of university governance
- 3) Globalisation / Economic models
- 4) IT Management
- 5) Elearning
 - a) Edublogs
 - b) Using Educational Technology
- 6) Cognitive models of learning
- 7) User-centred design / human factors

Melbourne / Monash Reports, Minutes, Websites etc

Governance

Melbourne and Monash have slightly different emphasis in their (web-based) presentation of governance and management.

Melbourne describes its governance structure

(<http://www.unimelb.edu.au/about/governance/>), committees

(<http://www.unimelb.edu.au/unisec/committees/>) and responsibilities in great detail, and outlines clear principles of accountability.

(<http://www.unimelb.edu.au/publications/accountability/>).

Monash states its goals fairly succinctly, presents its committees

(<http://www.adm.monash.edu.au/excerv/committees/>) and a comprehensive policy bank

(<http://www.adm.monash.edu.au/excerv/policies/>) and gives prominence to audit and risk management

(<http://www.adm.monash.edu.au/audit/risk/>) processes.

Teaching and learning policy at **Melbourne** is clearly linked to the Office of the DVC Academic (<http://www.unimelb.edu.au/dvc-academic/responsibilities.html>), whereas teaching at **Monash** (<http://www.monash.edu.au/teaching/>) is not clearly linked with any office.

Monash also has a specific Educational Technology Policy (<http://www.adm.monash.edu.au/execserv/policies/Academic-Policies/policy/educational-technology.html>) in contrast to the MettleWeb (<http://mettleweb.unimelb.edu.au/>) approach at Melbourne, where available support services for educational technology provide the guidance.

Higher Education Research and Policy

Melbourne:

Centre for the Study of Higher Education (CSHE) Website
(<http://www.cshe.unimelb.edu.au/>)

Nine Principles Guiding Teaching and Learning
(<http://www.cshe.unimelb.edu.au/pdfs/9principles.pdf>)

Monash:

Centre for Research in International Education (MCRIE)
(<http://www.education.monash.edu.au/centres/mcrie/publications/Monash>)

Information Architecture Planning

Monash:

Information Architecture Plan (Monash only access)
(<http://www.its.monash.edu.au/staff/plans/architecture/>)

The Open Group Architecture Framework site
(<http://www.opengroup.org/architecture/togaf8-doc/arch/>)

Melbourne:

Information Management Strategy (<http://www.unimelb.edu.au/isc/>)

IT Project Offices

Monash:

ITS Project Office (<http://www.its.monash.edu.au/staff/projects/>)

Modified Thomsett Project Management methodology
(<http://www.its.monash.edu.au/staff/projects/project-management/>)

WebCT Vista implementation: LMS MUSO Project
(<http://www.its.monash.edu.au/staff/projects/muso.html>)

Melbourne:

ITS Division Project Office (<http://www.infodiv.unimelb.edu.au/project-office/>)

Modified Prince2: Project management framework
(<http://www.infodiv.unimelb.edu.au/project-office/framework/index.html>)

Project templates (<http://www.infodiv.unimelb.edu.au/project-office/toolbox/templates/>)

Blackboard implementation: LMS Implementation Project

(<http://www.imp.unimelb.edu.au/ipp/project1054.html>)

Download project plan

(http://www.imp.unimelb.edu.au/ipp/1054University_Wide_LMS_Implementation_Plan-051205.doc)

Internal Reports:

Melbourne:

James, R. (2000) Status report on the impact on teaching and learning of multimedia and educational technology development grants.

Fritze, P. (2002) Report on the Evaluation of ICT Initiatives in Education. Report to TaLMET.

Acumen Alliance (2002) Multimedia Development Review Report to TaLMET.

Baldwin, G. and James, R. (May 2003) Final Report: Learning Management System Review, conducted by the CSHE.

KPA Consulting (Sep 2003) Review of proposed Enterprise-wide Learning Management System. Report to Senior Vice-Principal.

Monash:

LMS Post implementation review

Melbourne Monash Collaboration:

Kielgaldie, D., Lindley, J., Bearman, M. and Kotsanas, G. (2005) Evaluation of Melbourne and Monash Project Grants for Collaboration in Educational Technologies, 1998 - 2004. Final Report. June, 2005.

Models of university governance

University governance

Coaldrake, P. and Stedman, L. (1998) *On the Brink. Australia's Universities Confronting Their Future*. Brisbane: University of Queensland Press. ISBN54504499

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Cunningham, S., Ryan, Y., Stedman, L., Tapsall, S., Bagdon, K., Flew, T. and Coaldrake, P. (June 2000) *The Business of Borderless Education*, EIP Monograph, DETYA.

Coaldrake, P., Stedman, L and Little, P. (August 2003) *Issues in Australian university governance*. Brisbane: QUT.

(<http://www.chancellery.qut.edu.au/vc/governancefinal.pdf>)

Bradley, D. (2003) *University governance: Why is university governance an issue now?* University of South Australia. Transcript of presentation to Business Higher Education Round Table Conference. View online (<http://www.unisa.edu.au/cha/vcoffice/vcspeeches/2003/nov32003.asp>)

Bok, D. (2003) *Universities in the marketplace: The commercialization of higher education*. Princeton University Press. ISBN0691114129

(<http://en.wikipedia.org/w/index.php?title=Special:Booksources&isbn=0691114129>)

- Marginson, S. (2004) National and global competition in higher education, *The Australian Educational Researcher*, 31 (2), pp. 1-28.
- Rodan, P. (2004a) A contrasting courtship: The Monash takeover of Chisholm Institute of Technology. *Australian Universities Review*, 47(1), pp 20-21. Download from AUR Publications Site (<http://www.nteu.org.au/publications/aur/>)
- Rodan, P. (2004b) A modest victory for academic values: The demise of David Robinson. *Australian Universities Review*, 47(2), pp16-22. Download from AUR Publications Site (<http://www.nteu.org.au/publications/aur/>)
- Corcoran, S. (2004) Duty, discretion and conflict: Governance and the legal obligations of governing boards. *Australian Universities Review*, 46(2), pp 30-37. Download from AUR Publications Site (<http://www.nteu.org.au/publications/aur/>)
- Holloway, D. (2004) Corporate governance disaster. *Australian Universities Review*, 47(2), pp 23-29. Download from AUR Publications Site (<http://www.nteu.org.au/publications/aur/>)
- Moodie, G. (2004) The neglected role of a neglected body: Academic Boards' role in assuring 'equivalent' standards. *Australian Universities Review*, 47(1), pp 35-41. Download from AUR Publications Site (<http://www.nteu.org.au/publications/aur/>)
- The Observatory on Borderless Higher Education Reports See list of reports, Download via University subscription (<http://www.obhe.ac.uk/products/reports/>)
- King, R. (2006). *Globalisation, Institutional Aspirations and Regulation: The Australian National Protocols* (<http://www.obhe.ac.uk/products/reports/ftpdf/january2006.pdf>)
- Harris, J., Tagg, J. and Howell, M. (2005). *Organise to Optimise-organisational change and higher education* (<http://www.obhe.ac.uk/products/reports/ftpdf/june2005.pdf>)
- Holtham, C and Courtney, N. (2005). *Virtual Learning Environments: Practitioner Perspectives on Good Practice* (<http://www.obhe.ac.uk/products/reports/ftpdf/may2005.pdf>)
- Pollock, N. (2005). *Implications of Enterprise Resource Planning Systems for Universities: An analysis of Benefits and Risks* (<http://www.obhe.ac.uk/products/reports/ftpdf/april2005.pdf>)

LMS Governance

- Coates, H., James, R., and Baldwin, G. (2005). A critical examination of the effects of Learning Management Systems on university teaching and learning. *Tertiary Education and Management*, 11: 19-36. ISSN 13583883

Management and Governance

National Institute of Governance

(http://governance.canberra.edu.au/the_institute.html)

The National Institute for Governance, is a hub at the University of Canberra, aims to facilitate a multi-disciplinary network of governance researchers and practitioners, their organisations and professional associations focusing on the complex governance issues arising at the interface of the public, private and community sectors. Don't use a Mac at their website! LisaWise

Bridgman, P. and Davis, G. (2004) *The Australian policy handbook, 3rd Ed.* NSW: Allen and Unwin. ISBN1741142202
(<http://en.wikipedia.org/w/index.php?title=Special:Booksources&isbn=1741142202>)

This book gave us a general introduction to the theory and practice of public policy-making in the Australian context. (It also introduced me to the concept of having dot-points down the side of the text as a seductive way of speed reading LisaWise)

Furnham, A. (2005) *The psychology of behaviour at work: the individual in the organization. 2nd Ed.* New York, NY: Routledge Press. ISBN0841965041
(<http://en.wikipedia.org/w/index.php?title=Special:Booksources&isbn=0841965041>)

Organizations and Agents of Change

Haslam, A. (2004) *Psychology in Organizations: the social identity approach* Thousand Oaks, CA:Sage. ISBN0761942300
(<http://en.wikipedia.org/w/index.php?title=Special:Booksources&isbn=0761942300>)

Dixon, N. (1999) *The organisational learning cycle: how we can learn collectively. 2nd Ed.* Aldershot: Gower. ISBN0566080583
(<http://en.wikipedia.org/w/index.php?title=Special:Booksources&isbn=0566080583>)

<http://www.pangaro.com/>

Paul Pangaro was at MIT until 1977 and has served in various consulting roles since, including for Sun Microsystems. His major research and consulting interest is around cybernetic organizations.

Geoghegan, M.C. and Pangaro, P. (2004) *Design for a self-generating organization.* W.Ross Ashby Centenary Conference, University of Illinois, Urbana. (<http://www.pangaro.com/ashby/ashby8n.pdf>)

Geoghegan, M.C., Pangaro, P. Dubberly, H. and Esmonde, P. (2002) *Notes on the Role of Leadership and Language in Regenerating Organizations* Little Grey Book prepared for Sun Microsystems
(<http://www.pangaro.com/littlegreybook.pdf>)

Hebb, D.O. (1949) *The organization of behaviour: a neuropsychological theory.* New York: John Wiley and Sons. ISBN0471367273
(<http://en.wikipedia.org/w/index.php?title=Special:Booksources&isbn=0471367273>)

Classic psychology text on associative networks in which Hebb tried to link neurophysiology (now known as synaptic mechanisms) with human and animal psychology (memory). Preempted later neurophysiology work on long term synaptic potentiation and dynamic adaptive networks.

Snowden, D. (2005) Multi-ontology sense making: a new simplicity in decision making. *Management Today*, Yearbook 2005, Vol 20, pp 2-11.
(<http://www.kwork.org/Stars/Snowden/Snowden.pdf>)

Globalisation / Economic models

Gray, J. (1998) *False Dawn: the delusions of global capitalism.* New York: The New Press. ISBN1862070237

(<http://en.wikipedia.org/w/index.php?title=Special:Booksources&isbn=1862070237>)

Saul, J.R. (2005) *The collapse of globalism and the reinvention of the world*. Victoria:Penguin. ISBN0670042676

(<http://en.wikipedia.org/w/index.php?title=Special:Booksources&isbn=0670042676>)

Friedman, T. (2005) *The World Is Flat: A Brief History of the Twenty-first Century*. New York : Farrar, Straus and Giroux ISBN0374292884

(<http://en.wikipedia.org/w/index.php?title=Special:Booksources&isbn=0374292884>)

Walsh, A. (2004) A price on everything? Ethics and the widespread application of the money metric. *Res Publica* 13(1), pp 14-18. Res Publica website

(<http://www.philosophy.unimelb.edu.au/cappe/publications.php>)

IT Management

Software engineering, requirements gathering, project management, Open Source, Community Source, Proprietary Systems.

Raymond, E.S. (1997... 2006) *The cathedral and the bazaar*. Wikipedia description

(http://en.wikipedia.org/wiki/The_Cathedral_and_the_Bazaar) First Monday paper, 1998, 3(3)

(http://www.firstmonday.org/issues/issue3_3/raymond/index.html)

O'Reilly book, 1999 ISBN1565927249

(<http://en.wikipedia.org/w/index.php?title=Special:Booksources&isbn=1565927249>)

Bezroukov, N. Commentary First Monday paper, 1999, 4(12)

(http://www.firstmonday.org/issues/issue4_12/bezroukov/) Evolving thoughts (<http://www.catb.org/~esr/writings/cathedral-bazaar/>)

Severance, C. and others (2005) *Sakai and community source software open forum* Forum Website with podcasts, slides etc

(<http://www.infodiv.unimelb.edu.au/ets/pages/01sakaiopenforum.htm>)

Graham, P. (2005) *What business can learn from open source*. Blog entry

(<http://www.paulgraham.com/opensource.html>)

Markoff, J. (May 2, 2006) *Another code brick in the wall*. View article in Technology Section of The Age

(<http://www.theage.com.au/articles/2006/05/01/1146335641241.html>)

Elearning

Edublogs

The following educational weblogs provide a wealth of commentary and links to other resources on elearning. The first two listed, *Stephen's Web* and *Elearning Space* are the springboard for their own online communities of practice around elearning and educational technology, and demonstrate the rich potential of web-based learning networks.

Elearning Web Resources

Downes, S. *Stephen's Web* <http://www.downes.ca>

Siemens, G. *Elearning Space* <http://www.elearningspace.org>

Masie, E. *The Masie Center: Technology and Learning ThinkTank*
<http://www.masie.com/>

Individual Weblogs

- Feldstein, M. *E-literate* <http://mfeldstein.com/>
Pollard, D. *How to Save The World* <http://blogs.salon.com/0002007/>
Farmer, J. *Incorporated Subversion* <http://incsub.org>
Wilson, S. *Scott's Work Blog* <http://www.cetis.ac.uk/members/scott>
Norman, D. *Darcy Norman Dot Net* <http://darcynorman.net/>
Ip, A. *Random Walk in Learning* <http://elearningrandomwalk.blogspot.com/>

Using Educational Technology

- Twigg, C (2001) *Innovations in Online Learning: Moving Beyond No Significant Difference*. Center for Academic Transformation, Rensselaer Polytechnic Institute.
(<http://www.center.rpi.edu/Monographs/Innovations.html>)
(<http://www.center.rpi.edu/Monographs/Mono4.pdf>)
- ASTD/Masie Centre Executive Summary (2001) *E-Learning: if we build it, will they come?*
(http://www.masie.com/masie/researchreports/ASTD_Exec_Summ.pdf)
- Naidu, S. and Cunnington, D. (2002) The experience of practitioners with technology-enhanced teaching and learning. *Educational Technology and Society*, 5(1), pp 23-29. [ISSN 14364522]
- Reeves, T. C., Herrington, J., and Oliver, R. (2004). A development research agenda for online collaborative learning. *Educational Technology Research and Development*, 52 (4), 53-65.
- Laurillard, D. (2005) *E-Learning in Higher Education* (http://www.mdhsonline.unimelb.edu.au/~lwise/wiki_files/E-Learning_in_Higher_Education.pdf) , from Ashwin, P. (Ed) *Changing Higher Education* Routledge, London, ISBN0415341299
(<http://en.wikipedia.org/w/index.php?title=Special:Booksources&isbn=0415341299>)
Laurillard argues that we have not done enough to use elearning creatively in academia because although academics are excellent reflective practitioners in their research role, they do not understand the pedagogy of teaching their discipline areas.
- Mayer, R (ed) (2005) *Cambridge handbook of multimedia learning* New York:Cambridge University Press. ISBN0521547512
(<http://en.wikipedia.org/w/index.php?title=Special:Booksources&isbn=0521547512>)
A reference book for how people learn from multimedia tools
- Anderson, T. and Elloumi, F. (Eds) (2004) *The theory and practice of online learning* Athabasca University ISBN0919737595
(<http://en.wikipedia.org/w/index.php?title=Special:Booksources&isbn=0919737595>) (http://cde.athabascau.ca/online_book/) Download whole book (PDF 1.8 MB)
(http://cde.athabascau.ca/online_book/pdf/TPOL_book.pdf)
- Zemsky, R. and Massey, W.F. (2005) *Thwarted Innovation: What happened to e-Learning and why* a final report of the Weatherstation project of the Learning Alliance at the University of Pennsylvania in cooperation with the Thomson Corporation

(<http://www.thelearningalliance.info/Docs/Jun2004/ThwartedInnovation.pdf>)

Zemsky and Massey argue that the huge investments and early promises of transformation in pedagogy have not transpired into any noticeable improvement in teaching and learning.

Trinkle, D. (2005) *The 361° model for transforming teaching and learning with technology* Educause Quarterly, 2005(4) pp. 18-24

(<http://www.educause.edu/ir/library/pdf/eqm0543.pdf>)

DePauw University's program emphasises 10 key factors for success: 1) put learning first; 2) align IT with institutional mission and culture; 3) technology fluency is a new liberal art; 4) invest more in people and support than in hardware and software; 5) good enough is good enough; 6) support sustainable technologies; 7) actively involve students; 8) collaboration is essential; 9) use technology to remove barriers; 10) design spaces to enhance learning and build community.

ELearning 2.0

Downes, S. (2005) *E-learning 2.0. ELearn Magazine: Education and Technology in Perspective,*

(<http://www.elearnmag.org/subpage.cfm?section=articles&article=29-1>)

Downes, S. (2006) *Distributed Learning.* Blog entry

(http://www.downes.ca/archive/06/04_03_news_OLDaily.htm) Podcast, large download (<http://www.downes.ca/files/audio/tennessee.mp3>) Slides (<http://www.downes.ca/files/tennessee.ppt>)

Cross, J. (2006) *What is informal learning?* Blog entry

(<http://internettime.com/wordpress2/?p=551>)

Wilson, S. (2005) *Future VLE, The visual version.* View diagram

(<http://www.cetis.ac.uk/members/scott/entries/20050125170206>)

E-Portfolios

Feldstein, M. (2006) *If we build it, will they come?* Blog entry

(<http://mfeldstein.com/index.php/weblog/comments/343/>)

Anderson, T. (2006) *Are PLEs ready for prime time?* Blog entry

(<http://terrya.edublogs.org/2006/01/09/ples-versus-lms-are-plesready-for-prime-time/>)

Communities of Practice

Lave, J. and Wenger, E. (1991) *Situated learning. Legitimate peripheral participation.* Cambridge: Cambridge University Press.

Lave and Wenger develop the idea that learning 'is a process of participation in communities of practice, participation that is at first legitimately peripheral but that increases gradually in engagement and complexity'. ISBN0521423740

(<http://en.wikipedia.org/w/index.php?title=Special:Booksources&isbn=0521423740>)

Wenger, E. (1999) *Communities of practice. Learning, meaning and identity.* Cambridge: Cambridge University Press. ISBN0521663636

(<http://en.wikipedia.org/w/index.php?title=Special:Booksources&isbn=0521663636>)

Etienne Wenger's web site (<http://www.ewenger.com/>)

Wikipedia entry on Communities of Practice

(http://en.wikipedia.org/wiki/Community_of_practice)

Social implications of new technology and the age of information

- Seely Brown, J. and Duguid, P. (2000) *The Social Life of Information*. Boston, MA: Harvard Business School Press ISBN0875847625
(<http://en.wikipedia.org/w/index.php?title=Special:Booksources&isbn=0875847625>)
- Prensky, M. (2001) *Digital Natives, Digital Immigrants*. from *On the Horizon*, NCB University Press Vol. 9 No. 5, October 2001 Download articles written by Prensky (<http://www.marcprensky.com/writing/>)
- Downes, S. (2005) *Semantic Networks and Social Networks*. The Learning Organization Journal, 12(5) Web article (<http://www.downes.ca/cgi-bin/page.cgi?post=31624>)
- Downes, S. (2005) Understanding PISA *Turkish Online Journal of Distance Education*, 2005,6(2) View online
(<http://tojde.anadolu.edu.tr/tojde18/articles/article10.htm>)
"The headline was dramatic enough to cause a ripple in the reading public. "Students who use computers a lot at school have worse maths and reading performance," noted the BBC news article, citing a 2004 study by Ludger Woessmann and Thomas Fuchs which in turn was an analysis of a 200 study by the OCED called PISA. But did the headline get it right? For a variety of reasons - no."
- Schilling, P. (2005) *Technology as epistemology*. Blog entry
(<http://www.academiccommons.org/commons/essay/technology-asepistemology>)

Content and content management

- Downes, S. (2005) *The economy of elearning* Blog entry
(<http://www.downes.ca/cgi-bin/page.cgi?post=5>)
- Downes, S. (2004) *The learning marketplace: meaning, metadata and content syndication in the learning object economy*. Moncton, New Brunswick. Download in a variety of formats
(<http://www.downes.ca/files/book3.htm>)

Identity Management

- Downes, S. (2005) *Identity and Authentication* Web Article
(<http://www.downes.ca/cgi-bin/page.cgi?db=post&q=crdate=1115168586&format=full>)
- Howell, C. (2005) Comments on Facebook.edu Blog entry, May 2006
(http://connect.educause.edu/blog/catherine/follow_up_on_facebook_edu_students_software_and_emergent_social_practices/2332)

Cognitive models of learning

Notions of Expertise

- Sternberg, R.J. and Grigorenko, E.L. (Eds) (2003) *The psychology of abilities, competencies, and expertise*. New York, NY: Cambridge University Press. ISBN0521007763
(<http://en.wikipedia.org/w/index.php?title=Special:Booksources&isbn=0521007763>)
This book tries to bring together relationships between three intrinsically linked concepts which have generally been studied separately or pairwise. Ability theorists generally ignore the literature on the

importance of deliberate practice in the development of expertise, whereas expertise theorists tend to ignore the contribution of abilities to the development of expert levels of performance. Competencies tend to be considered in terms of the measurement of abilities (end point) or as the baseline for development of expertise (start point).

Leadership and creativity

Bennis, W. and Biederman, P.W. (1997) *Organizing genius: the secret of creative collaboration*. Reading, MA: Addison-Wesley. ISBN0201570513 (<http://en.wikipedia.org/w/index.php?title=Special:Booksources&isbn=0201570513>)

In this book, Bennis and Biederman explore the dynamics which made some great groups successful. "Great Groups hope to make a dent in the universe ... they flare like a rocket for a while, then vanish, leaving behind their creation ... The thrill of the game, not the money, is what matters it seems, making one wonder whether pouring ever more money into our managers is implicitly a confession that there is no thrill in their game. Talent, they find, needs its own niche; roles in Great Groups are not interchangeable, so we may perhaps be ruling out the chance of greatness when we insist upon interchangeability in our everyday workgroups in the name of efficiency ..." Charles Handy, Foreword

Heinzen, T.E. (1994) *Everyday frustration and creativity in government: A personnel challenge to public administration*. New Jersey: Ablex Publishing Corporation. ISBN1567500900 (<http://en.wikipedia.org/w/index.php?title=Special:Booksources&isbn=1567500900>)

Heinzen examines the creative approaches taken by individuals within the New York public administration to deal with the institutionalised frustrations inherent within government bureaucracies. Some approaches are positive, some negative (depending of course on viewpoint), and much of the creativity in departments undergoing constant change is about self preservation and territory building rather than about public service.

Language and communication

McWhorter, J. (2001) *The power of babel: a natural history of language*. London: Random House. ISBN0434007897 (<http://en.wikipedia.org/w/index.php?title=Special:Booksources&isbn=0434007897>)

Chomsky, N. (1988/2004) *Language and politics*. Oakland, CA: AK Presss. ISBN1902593820 (<http://en.wikipedia.org/w/index.php?title=Special:Booksources&isbn=1902593820>)

Watson, D. (2003) *Death sentences: How clichés, weasel words, and management-speak are strangling public language*. Sydney: Random House Australia ISBN1740512065 (<http://en.wikipedia.org/w/index.php?title=Special:Booksources&isbn=1740512065>)

Watson, D. (2004) *Watson's dictionary of weasel words, contemporary clichés, cant and management jargon*. Sydney: Random House Australia ISBN1740513215 (<http://en.wikipedia.org/w/index.php?title=Special:Booksources&isbn=1740513215>)

Stenning, K., Lascarides, A. and Calder, J. (2006) *Introduction to cognition and communication*. Cambridge,MA: Bradford. ISBN0262195380
(<http://en.wikipedia.org/w/index.php?title=Special:Booksources&isbn=0262195380>)

Unlike books on use of language (lamenting the death of clarity in public language, or discussing the choice of words and evolution of language), this book is about models of language, models of representation, theory of mind. It explores relationships between utterance and meaning, between language and diagrams and seeks to understand communication and representation rather than just language in the narrow sense of words and their meanings.

User-centred design / human factors

Human factors and design

Norman, D. (2004) *Emotional Design; why we love (or hate) everyday things*
New York,NY:Perseus Books. ISBN0465051359
(<http://en.wikipedia.org/w/index.php?title=Special:Booksources&isbn=0465051359>)

Norman, Donald A. (1988) *The Design of Everyday Things*. New York,
NY:Doubleday. ISBN0465067107
(<http://en.wikipedia.org/w/index.php?title=Special:Booksources&isbn=0465067107>)

Vicente, K. (2003) *The Human Factor: Revolutionizing the Way People Live with Technology*. New York, NY: Random House Canada.
ISBN0415970644
(<http://en.wikipedia.org/w/index.php?title=Special:Booksources&isbn=0415970644>)

Interface design

Schneiderman, B. (1992) *Designing the User Interface: Strategies for Effective Human-Computer Interaction*. Reading, MA:Addison-Wesley.
ISBN0321197860
(<http://en.wikipedia.org/w/index.php?title=Special:Booksources&isbn=0321197860>)

Preece, J., Rogers, Y. and Sharp, H. (2002) *Interaction Design: Beyond Human-Computer Interaction*. New York. NY: John Wiley & Sons.
ISBN0471492787
(<http://en.wikipedia.org/w/index.php?title=Special:Booksources&isbn=0471492787>)

Visual Design

Nielson, J. (2002) *Designing web usability: the practice of simplicity*.
MacMillan. ISBN156205810X
(<http://en.wikipedia.org/w/index.php?title=Special:Booksources&isbn=156205810X>)

Tufte, E. (1983) *The visual display of quantitative information*. Graphics Press.
ISBN0961392142
(<http://en.wikipedia.org/w/index.php?title=Special:Booksources&isbn=0961392142>)

- Tufte, E. (1990) *Envisioning information*. Graphics Press. ISBN0961392118
(<http://en.wikipedia.org/w/index.php?title=Special:Booksources&isbn=0961392118>)
- Tufte, E. (1997) *Visual Explanations: Images and Quantities, Evidence and Narrative*. Graphics Press. ISBN0961392126
(<http://en.wikipedia.org/w/index.php?title=Special:Booksources&isbn=0961392126>)
- Tufte, E. (2003) *The cognitive style of powerpoint*. Graphics Press.
ISBN0961392150
(<http://en.wikipedia.org/w/index.php?title=Special:Booksources&isbn=0961392150>)
- Steffens, S. (2003) *The Cognitive Style of PowerPoint* Blog entry
(http://contactsheet.org/articles/2003/08/28/the_cognitive_style_of_powerpoint.html)
- Schwarz, A. (2003) *Powerpoint remix* Blog entry
(<http://www.aaronsw.com/weblog/000931>)