

Implementing new technologies across the organisation: The LAMS@Macquarie project

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The LAMS @ Macquarie University Implementation Project is an enterprise-wide project which aims to develop and promote the use of LAMS (the Learning Activity Management System) across the University. This paper is a brief exploration of some of the early indications from the research conducted during Stage 1. We consider some of the challenges of adopting the next generation of e-learning tools, in particular the issues surrounding adoption and dissemination, establishment of a community of practice, and creation and sharing of reusable learning designs.

Keywords: implementation, LAMS, Learning Activity Management System, reusable learning designs, community of practice

Introduction

The LAMS@Macquarie University Implementation Project (LAMS@MQ project) was conceived as a two year project to encourage the wider adoption of LAMS, the Learning Activity Management System, at the institution where the software is being developed. At the time of writing, the project had been in operation for 12 months (July 2005–June 2006) and was preparing for a second year of funding. Stage 2 was expected to allow for embedding of the processes in university systems and the wider dissemination of innovation, potentially leading to identifiable quality improvement in teaching and learning. This brief paper is not the full evaluation report, but gives indications of the challenges faced. A more comprehensive data analysis will be reported in a future paper.

The aim of the project was specifically to integrate, develop and promote the use of LAMS across the University. This was achieved through an education and staff support program, and a technical integration of LAMS into WebCT (the current Learning Management System, LMS), resulting in single sign-on access to both systems. Effective communication was a central concern of educational development, training and dissemination strategies during the implementation, a concern shared and noted by the University of Queensland in their LMS implementation (Steel, 2005). The choice of language adopted when working with staff was paramount to ensure ownership of change. Project, communication and evaluation plans, and reference to a steering committee were key project management elements.

Methodology

We took an action research approach to capture the complexity of the relationship between institutional change and individual and staff practices. The full evaluation plan is available at the project website, <http://www.melcoe.mq.edu.au/projects/LAMS@MQ/evaluation.htm>, and includes details of expected outcomes, indicators etc. Space prevents us from including this in this paper. Our general research questions were: 1) How does LAMS impact on staff and students? 2) What is the efficacy of LAMS for the Macquarie context? 3) What are the implications for future use? Formative and summative data was gathered from a range of sources and stakeholders: informal discussions and interviews with staff; observations of LAMS classes – virtual and actual; training and support sessions; student online forums; the LAMS Community forums and sequence repository; reflective journals; project documentation and communications; server logs; a student and a staff online questionnaire; and seven focus groups – one with staff and six with students.

Implementation

The results of previous trials of LAMS in Australia and the UK (Russell, Varga-Atkins, & Roberts, 2005; Gibbs & Philip, 2005; JISC 2005) had shown that, while individuals might be encouraged to use LAMS,

broader adoption was unlikely unless enterprise-wide systemic support was provided, both technical and educational. The project was funded through an internal grant and strategically integrated with the teaching development grants scheme. The importance of commitment from the organisation to the success of educational change is well known (e.g. Ely, 1999; Kenny, 2002, in Kenny 2003; McKenzie, Alexander, Harper, & Anderson, 2005); and Weedon, Bricheno and Chidwick, (2004) in the Joint Information Systems Committee (JISC) report from the UK on the impact and introduction of large-scaled networked learning concluded that: 'Large-scale networked learning appears to have the greatest impact in institutions that implement it through complementary top-down (managerialist) and bottom-up (develop core competencies) trajectories (Nicol et al., 2004 in Weedon, Bricheno & Chidwick, 2004)'. However, they noted important exceptions where there was staff support for materials development, resulting in high levels of engagement with networked learning. The project adopted all three strategies identified by the JISC: top-down institutional commitment (funding and political support); bottom up support (training and educational development); and staff support of 'materials' development through educational development support. Further, if we were to measure Stage 1 of the project against Ely's (1999) seven 'conditions' of successful implementation, it would rate reasonably well (see Table 1).

Table 1: Rating of the project against Ely's conditions for successful implementation

Condition	Rating		
	High	Medium	Low
1 Commitment from the organisation	X		
2 Participation of key stakeholders in planning and design decisions		X	
3 Leadership and role modelling by immediate supervisors			X
4 Provision of adequate resources	X		
5 Provision of adequate time for innovators to learn new skills and realise the implementation		X	
6 Assessment of the level of knowledge and skills of the likely users	X		
7 Rewards and incentives to motivate users		X	

Ely does not include context in his seven conditions, but inevitably politics, economics and culture are important factors that impinge on success. A number of these factors will become problematic in Stage 2 because of changes in the executive of the organisation. This may affect (1), (4) and (7), i.e. commitment from the organisation, resource provision, and rewards and incentives, and the context of implementation, as there is now a much greater emphasis on research within the University.

Adoption and impact across the organisation

While LAMS is a relatively easy technology to use, with low technical requirements, evidence from Stage 1 indicates that there are still barriers, actual and perceived, technical and educational, which impede more rapid uptake of the technology, and therefore positive impact on teaching and learning. LAMS finds a place within current learning and teaching environments as a tool for better facilitating activities in an online or blended learning environment, and moving groups of students through collaborative activities. Evidence from the project indicates that in the university context LAMS is most likely to be used as an adjunct to a Learning Management System. Its visual representation of educational design as a flow of tasks helps make the pedagogy for any activity more explicit to the designer: our data indicates this has promoted reflection on activity design by some users authoring in LAMS, both students and teachers. LAMS also enables the capture, sharing and modification of reusable learning designs.

LAMS has been trialled in the project in 30 discrete units over the twelve months with 13 repeated units (total of 43 units). It is expected those numbers will at least double in Stage 2. In addition to staff authoring of sequenced activities, students in the School of Education have also authored their own sequences as part of assessment activities. Table 2 provides some of the usage statistics. There has been a steady growth in usage over the twelve month period, but as Marshall (2004) and Steel (2005) confirm, effectively embedding ICTs in a sustainable way into teaching and learning programs is a long term process, which involves cultural, structural, strategic and political change. Any of these factors can act as barriers to adoption of innovation.

Table 2: Usage of LAMS over first 12 months of project

Item	Number
Units where LAMS implemented, i.e. 'live' (includes repeated units)	43
Repeated units	13
Total staff and students accounts created on main project server	1131
Staff/lecturer accounts created	101
Student accounts created (excludes deleted accounts)	833
Departments or Centres with accounts	31
Organisations created on LAMS@MQ server	34
Staff using LAMS in more than one unit.	8
Program wide usage (commitment to substantial no. of units)	3
WebCT/LAMS integration accounts (over 6mths)	104
Staff accessing LAMS through the integration	18
Departments where students authoring sequences	3
Sequences created by students for assessments	235
Attendees at formal training/demos/seminars	374

Barriers and challenges

Overall, some of the barriers to implementation revealed through the data in Stage 1 are as follows:

Educational and professional development barriers

Previous conceptual models of e-learning and e-learning tools held by teaching and support staff

Comparison of LAMS with previous e-learning systems may inhibit understanding of the efficacy of the innovation, e.g. the value of LAMS to support collaborative activities and systematically facilitate activity flow, modelling tutorial patterns of engagement, rather than acting only as a tool for content delivery or communication. (This is a cultural change issue.)

Professional development and change management issues for academic and support staff

For example, using LAMS as a collaborative tool *within* tutorials and laboratory sessions requires new strategies, compared with using the software as a tool only for independent study by students outside face-to-face attendance times. Additionally, use of the LAMS repository of templates, i.e. re-use of learning designs is a relatively new approach. (Requires educational and cultural change.)

Poor resourcing of casual or junior staff to implement innovation

These staff are often the most enthusiastic, willing to take risks and be innovative, but are seldom paid to attend training or spend time on development. Further, they have limited time to contribute to a community of practice or mentor other staff, activities which help sustain innovation on a wider scale. (Structural issue.)

Lack of just-in-time pedagogical support

A time and resource issue. There is a need for mentoring by colleagues and/or educational support personnel to, e.g., provide feedback on the efficacy of the design model used in any LAMS sequence or series of activities, to assist with judging the probable time to be allocated for collaborative tasks (which is usually more than predicted), and to troubleshoot technical issues. (Requires structural change to ameliorate.)

Time lag between first trials of the LAMS software and actual implementation

This has been observed to be 12 months or more in some cases. (Political issue to communicate this to executive.)

Short courses which have only limited windows of opportunity for implementation of the technology

For example, where LAMS activities run in a 10 week course staffed predominantly by casual teachers, issues of staff readiness, training, support, and access emerge. If the implementation opportunity is missed, there is no time to try LAMS again with the same cohort of students, and staff. (Strategic issue.)

Courses with large classes, or where there is team teaching make change more difficult to implement
Coordinating a team of academics to undertake technical and pedagogical change is complex, and some staff perceive equity issues across the cohort if only a small group of students trial the technology, so will not implement LAMS until the whole cohort is able to do so. (Strategic issue.) Further, there is a monitoring issue when tutorial numbers are high: limitation of the LAMS monitoring interface (V1.0.2) to provide adequate labelling of multiple Noticeboards with student records – it is cumbersome and confusing. This should improve in LAMS V2, to be used in 2007.

Technical barriers (most of which are structural issues)

Local configuration issues

For example, there were problems accessing the LAMS server across the main campus from some lecture theatres due to varying local subnet mask configurations.

Access

Access to WebCT and LAMS was delayed in some courses where there was early enrolment or non-standard patterns of attendance. Sequences set early in the course could be jeopardised.

Scalability

The number of concurrent users accessing LAMS had to be controlled in Stage 1 – both a software and server issues. LAMS V2, the upgrade for 2007, however, will be suitable for use at scale, installed on the central Online Teaching Facility, not the lower capacity Stage 1 server.

Reliability of IT infrastructure across the University

Organisational network system downtime was often interpreted by students and sometimes staff as a problem with LAMS, not as a network issue.

Tolerance of technical failure related to system or software failure

This varies enormously with individuals, but was most often related to Authoring in LAMS, rather than use of the software as a Learner, e.g. LAMS V1.0.2 has no auto-save, and loss of work whilst authoring through the browser interface (which can time out) was a common problem for some novice users.

Dissemination through a community of practice

Effective dissemination is one of the greatest challenges of a project which encourages new ways of engaging, relating and communicating in learning and teaching. It is easy to use new tools in traditional ways and, unfortunately possibly ineffective ways (Oliver & Omari, 2001). So, to disseminate best practice there is a need to build a community of practice where understanding, knowledge and problems are shared, as researchers such as Wenger, McDermott and Snyder (2002), and Brown and Gray (2004) encourage. Informal networks across disciplines and the formal structures of the organisation are important for sharing 'culture', and sustaining innovators. As a focus for sharing and dissemination in this project, we encouraged the use of the LAMS Community website and learning design repository (<http://lamscommunity.org>). Usage of the special private forum for Macquarie personnel has been slow to date, and anecdotal evidence suggests that staff may read forum discussions, but not actively contribute. A research writing group around LAMS is to be implemented, and the LAMS Community is expected to act as a focal point for the group, supplementing face-to-face meetings. The LAMS Community repository contains reusable learning designs stored as .las files that can be freely downloaded and shared, providing a significant editable resource for teachers and students. Ten of the designs in the K-12 section are exemplar student contributions created for assessment by Macquarie students. Of the 1313 users in this international community, 80 are from Macquarie. The repository holds about 97 sequences or templates, with varying degrees of additional implementation information attached in the form of text files and metadata. Licensing is governed by the Creative Commons approach, i.e. designs are free to share, but acknowledgement of the author is a condition of use.

Issues which our research show may impact on usage of the repository, and therefore dissemination include the following:

- The peer review system is unregulated, and no criteria are set by which judgements can be measured.

- The review system is not sufficiently well used by members so, for those searching through the database for reusable designs, indicators of the quality of sequences are not necessarily apparent.
- Sequences cannot be previewed in the repository; a second stage in the process of re-use is required – the sequence must be downloaded from the repository and then uploaded into LAMS.
- Contribution of designs is a public act which exposes the author's teaching and learning approach.
- Copyright material in the sequence must be removed before metadata is added prior to publication.
- Despite best intentions, uploading a sequence is a task that assumes low priority – only four staff who have taught with LAMS at Macquarie have contributed sequences to the repository.
- There is no explicit reward for contributing to the repository – a political and educational issue.

Conclusion

Stage 1 of this project, when measured against the JISC and Ely criteria, is well founded for success. However, embedding LAMS as an effective technology to enrich teaching and learning across the organisation cannot be achieved in twelve months. Promotion of a community of practice, and availability of a reusable learning design repository provides support for sustainable practices and dissemination. Nonetheless, to improve usage of the repository, more attention to issues of cultural change, and reward systems (requiring strategic, political and structural change) need to be put in place to foster a broader culture of reuse and dissemination of best practice.

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