Embedding key skills into the curriculum through networked learning: an evaluation of implementation strategies

Helen Keighley and Gabi Diercks-O'Brien, Centre for Access & Lifelong Learning, University of Lincolnshire and Humberside

This paper aims to identify opportunities and barriers surrounding successful technology implementation in Higher Education (HE). The paper incorporates the results of an external evaluation, undertaken by Professor Harold Silver, of the implementation of a networked learning environment (NLE) in six HE institutions as part of the ELEN Project (Extended Learning Environment Network). The evaluation was formative in nature and aimed to recommend how the consortium could enhance the implementation process in the project's second phase. The evaluation was sought as a means to afford all stakeholders the opportunity to make a critical assessment of how successful the implementation of ELEN had been and where improvement was needed. This paper, therefore, provides an overview of and reflection on both the problems experienced and the benefits found by HE staff involved in the project. Although specific to the project, the ELEN experience and the reflections reported herein will be of value to other institutions or technology projects.

The ELEN Project

The Dearing Report identified key skills as central to the future success of graduates and in creating an effective 'learning society'. The Report also argues that the innovative use of information technology can improve the quality, flexibility and effectiveness of HE, in terms both of innovative and flexible subject content delivery and of management and development of the learning environment. (Dearing 1997)

The ELEN Project, funded by HEFCE's national technology initiative the Teaching and Learning Technology Programme (TLTP), aims to address the issues of implementing new technologies and assess the effectiveness of using C&IT to work someway towards addressing the visions of the Dearing Report. The ELEN project focuses on utilising technology to assist student development of both key skills and subject-based knowledge to identify best practice for implementation and investigate student and staff interaction with technology. Phase one of ELEN concentrated on the integration of on-line key skills resources into the curriculum using a NLE, the *Virtual Campus*. Phase two of the project will concentrate on embedding resources in a variety of electronic formats to assist in developing students' subject knowledge.

Approach to evaluation

The introduction of NLEs into the curriculum, like any other innovation, succeeds or fails on implementation. It is therefore important that all factors which create opportunities for, or barriers to, change are addressed. There are no magic recipes for successful implementation – what proves to be a successful strategy for one institution may fail in another and formative evaluation is a powerful tool to identify the origins of implementation issues. Many of the ELEN evaluation findings are in accordance with the results of a study undertaken at the University of Canberra, which identified the factors contributing to successful implementation with regard to 104 technology projects. (Alexander *et al.* 1998) Previous investigations into the implementation process of technology such as this, however, have often centred on one institution or aspect, such as staff training provision (Alexander 1999), whereas ELEN provides an opportunity to transcend site-specific innovations and make global statements about technology implementation.

The evaluation approach was based on a belief that implementation should be both systematic and supported. Therefore, the evaluation needed to investigate the following (based on an application of the 'Managing Change Model' (Ford *et al.* 1996):

- Did the objectives of the institution support implementation?
- Did the existing infrastructure of the institution facilitate implementation?
- Did the structures and the key individuals of the organisation support implementation?
- Did the processes initiated to manage implementation succeed?

The evaluation was anonymised to allow staff to be open about their experiences. The report focuses on areas of difficulties experienced by staff, as well as their successes, in order for the project to critically assess and enhance the implementation process in the second phase. The report is of a qualitative nature and therefore emphasises detail rather than statistics and issues raised are generally representative of all institutions unless otherwise stated.

The following data is drawn from:

- semi-structured interviews at each institution with project managers and senior university managers (steering group member);
- two focus groups with 6 project leaders each (12 out of 22 accepted the invitation);
- 3 out of 6 questionnaires to a senior person in computer services in each of the institutions;
- 5 out of 6 questionnaires to campus managers;
- 11 out of 22 questionnaires to project leaders;
- university and project documentation.

Motivations for using networked technology for key skills delivery

The common institution motivation for joining the project began with an interest in utilising the Effective Learning Programme (ELP), a skills programme complete with on-line resources, and the *Virtual Campus*, both developed and successfully implemented at ULH. However, individual and institutional motivations differed and these included:

- ELEN seemed relevant to improving the delivery of key skills at a significant moment in policy development and implementation and was seen as a "selling point for recruitment";
- ELP and the *Virtual Campus* seemed ideal and served multiple aspirations for staff to utilise what was believed to be a "tried and tested" system;
- ELEN was seen as an opportunity to extend activities in on-line development and investigations into NLEs; and as a chance to experiment with technology;
- CAL was seen to enhance the student learning experience;
- staff feared marginalisation if the institution did not get involved in using technology to support learning;
- staff were attracted to the ELEN project because they either knew the ULH project director or had seen a presentation of ELP and the *Virtual Campus*.

Other investigations with regard to institution's and individuals' motivations for uptake of NLEs have suggested external and internal pressures (competitiveness, student numbers, curriculum change) to be the main drive rather than a real commitment to improving learning outcomes (Oliver 1999), and ELEN is no exception.

Barriers to implementation

The results of the evaluation of phase one have revealed that there are many barriers to the successful implementation of technology that are common across the consortium, including: lack of staff time; infrastructures that were not developed or prepared for technological

innovation; local administrative difficulties; and project difficulties in supporting training. Although the focus of the ELEN evaluation was wide ranging, for the purposes of this paper three main areas will be focussed on, namely, technical issues, roles and responsibilities and institutional contexts.

Technical problems

ELEN suffered a series of unforeseen technical issues in the first year of the project. Although this is to be expected when using new technologies, transferring a seemingly reliable NLE to other institutions proved problematic and this played a crucial role in the successful and timely introduction of the technology. The main issues were:

- lack of appreciation of the differences in technical infrastructures and the technical processes required to set up the system elsewhere;
- lack of appreciation of the willingness, or ability, of local technical staff to set up the system and resolve local issues;
- technical staff were not always informed early enough, or in enough detail, about what would be expected of them or the local network systems;
- local system problems, for example, where institutional networks were not robust or advanced enough to run the technology.

These issues were also exacerbated by the privatisation of the *Virtual Campus* mid way through phase one which led to on going and unexpected system developments and a change in the technical support structure.

Staff were very positive about the contribution of web-based learning to key skills development, although many had unrealistically high expectations of the use of an NLE. The *Virtual Campus* and ELP resources were seen "as god's gift to key skills" which perhaps explains some of the disappointment staff felt when technical problems arose and they began to realise how complex the installation of technology and the training of users and authors was.

The degree of technical problems encountered by staff severely affected the achievements of the first phase of the project and influenced the attitudes of staff both to their own project work and ELEN at large. However, it is also significant to note that despite the technical issues staff saw such promise in the technology and their personal learning experiences gained from working with it that they continued to develop their projects.

Roles and Responsibilities

Staff believed that although institutions supported their work in dealing with both technology and key skills in principle this was not always true in practice. Some staff teams worked in relative isolation within their institution and in such cases the consortium provided much needed practical and moral support. The lack of real institutional support manifested itself in a lack of staff time. Staff were attempting to manage or develop projects over and above their usual workloads and the lack of time often meant local managers did not have sufficient time to monitor projects, teaching staff did not have time to trial projects sufficiently or in good time and technical support and training was provided *ad hoc* and only when asked for. Training manuals provided by the *Virtual Campus* provider were found to be inappropriate and the lead site also made mistaken assumptions about the technical skill levels of the staff using the technology.

It is clear, therefore, that a key to successful implementation is staff having both the time and necessary skill sets to undertake the required work and absence of these proved to be a universal barrier. It has, however, provided the institutions with an opportunity to assess the

roles and skill levels of staff and also begin to develop the necessary support infrastructures. Teaching and learning with new technology requires a reassessment of the roles and responsibilities of both teaching and support staff and a reassessment of roles inevitably requires staff development. Providing effective training is also, therefore, a crucial factor in equipping staff with the skills to utilise new technologies.

Institutional contexts

The context of individual projects and institutions varied widely with regard to scale, nature and purpose of the implementation. Differences existed in student numbers, institutional structures, expectations, roles of project managers and the nature and extent of support from senior management or technical services.

Although it takes time to understand the cultural differences between institutions in order to fully appreciate the different approaches taken to key skills and technology implementation (Hobbs 1999), it was apparent that, in many of universities, there was no clear objectives for the provision of key skills or the use of NLEs and hence no infrastructures to support the work with technology. There were also differences in relation to attitudes and provisions for key skills development. On one hand, skills were accepted as an integral part of a module or course. On the other, some institutions or staff believed that skills should remain outside of subject modules. A lack of systematic approach either at institutional or departmental level could affect the outcome not only of the projects but of the success of the individual courses.

Both the successes and the difficulties faced in the first phase of ELEN, were somewhat rooted in the motivations for signing up to the project and in the starting point of each institution. These affected the definition of roles and responsibilities within the institution, perceptions of ELEN, the contexts in which ELEN was introduced to the staff and approaches to implementation. Where there was confusion over these or a lack of clear direction, the processes was impeded but the project has offered an opportunity to reassess the institutional context and in at least one institution the work and outcomes of ELEN have been incorporated into their new Teaching and Learning Strategy.

Perceived benefits for stakeholders

Regardless of the barriers faced by staff in implementing the technology, staff did perceive real benefits to implementing NLEs to deliver key skills both for themselves, their students and the institution:

- Students
  - ELEN was seen as a means for students to acquire key skills more easily;
  - students would be using IT to access resources and thus developing their IT skills;

- Staff
  - curriculum change and skills introduction was a motivator to staff;
  - ELEN provided a supported environment through the consortium and provided contacts with other likeminded staff;
  - ELEN seemed like the ideal tool for an easy solution to increased workloads or student numbers;
  - opportunity to test ELEN against other platforms;

- Institutions
  - those who had background knowledge about technology had clear notions about ELEN and thought that it could make the learning experience more interesting;
  - ELEN provided a means of teaching with new methods which they believed would attract students;
  - institutions felt that ELEN kept them in line with new technological developments in teaching.

Reflections

It is clear that the introduction of technology into a HE setting is problematic and complex, especially when undertaken by academic innovators rather than as an institutional initiative.

Where staff did not have effective support within the institution, as was true in some cases, or where staff felt isolated or out of their depth with technical issues some projects were reduced in scope and so it is clear that managing the actual support process of implementation is crucial to the success of the introduction of technology. Staff, however, have developed new skills and awareness and also accepted that experiencing and overcoming problems is part of the learning process and adopted a longer term vision for perceived benefits.

Positive outcomes are already apparent within the project, for example, a heightened awareness of educational technology issues and the need for careful project planning and trialling have been seen in new phase two projects. Institutional managers are also now providing more targeted support for projects. Although it would be premature to expect major departmental change as a result of an individual project, let alone institutional change, a pilot project such as ELEN can make significant comment on the changes to infrastructures and roles needed in order to implement technology institutionally or departmentally.

ELEN has identified a number of direct positive outcomes from the experiences of phase one:

- staff have a greater awareness of the necessity of systematic approaches to implementing technology;
- staff have identified communication frameworks as crucial, especially with technical staff;
- senior management have felt pressured to smooth the process of implementation;
- communication with technical staff has increased and in several cases additional posts have been created with funds made available for technical support and "implementation" staff;
- institutions have developed a greater awareness of other technology initiatives and have developed an orientation towards partnerships;
- the project team have identified training in the use of technology as crucial to the success of academic staff embedding technology into learning;
- in working as a consortium, staff have gained from each other's expertise and experiences;
- institutions have assessed the advantages and disadvantages of other NLEs, clearly an indicator for a growing commitment towards institutional change.

Best practice in implementing technology projects

The ELEN evaluation has revealed a number of issues central to the successful implementation of NLEs in any HE institution, regardless of status, politics or organisational structure. The following are ELEN's five main recommendations for best practice in implementing NLEs:

1. staff must be made aware of the potential, but also the limitations, of technology and staff must feel some level of ownership;
2. staff development is crucial to not only introduce people to the practicalities but also to the new pedagogies behind using networked technology effectively;
3. institutions should establish appropriate infrastructures to ensure effective communication between key staff and to ensure adequate support for both staff and students;
4. staff must be allocated real time to work on developing new teaching methods and also have the time and resources to trial and pilot them sufficiently before use;
5. senior management must show support to staff using new technology through recognition and reward of teaching innovations and development work.

The main conclusion of ELEN, however, is that although projects of this nature are an immense opportunity for universities to allow staff to explore new ways of teaching with NLEs, senior management should accept that it is impossible to seamlessly embed such technologies and embed technology effectively real resources and real time must be made available to staff and supporting infrastructures must be in place to assist the integration and use of technology. (Alexander et al. 1998, Buckner & Stoner 1996)

References

Alexander, S., McKenzie, J. & Geissinger, H. (1998). *An Evaluation of Information Technology Projects for University Learning*. (Executive Summary). University of Canberra.

Alexander, W. (1999). *TALiSMAN Review of staff development courses and materials for C&IT in teaching, learning and assessment.* (Summary Report). Heriot-Watt University.

Buckner, K. and Stoner, G. (1996). Practical implementation issues, in Stoner, G. (Ed.) (1996). *LTDI. Implementing Learning Technology.* Heriot-Watt University, 41-45.

Committee of Scottish University Principals (1992). *Teaching and Learning in an Expanding Higher Education System.* ('The MacFarlane Report'). Edinburgh: SCFC.

Dearing, R. (1997). *Report of the National Committee of Enquiry into Higher Education.* HMSO.

Ford, P., Goodyear, P., Heseltine, R., Lewis, R., Darby, J., Graves, J., Satorius, P., Harwood, D. & King, T. (1996). *Managing Change in Higher Education. A Learning Environment Architecture*. SRHE & OU: Buckingham.

Fullan, M.G. (1982). *The Meaning of Educational Change*. New York: Teachers College Press.

Higher Education Funding Council for England (1999). *Use of TLTP Materials in UK Higher Education.* (HEFCE Report). June 99/39.

Oliver, R. (1999). Exploring strategies for on-line teaching and learning. *Distance Education*, 20 (2), 240-254.

Richardson, J. (1996). *Changing Courses - Strategies for Changing the HE Learning Environment*. Open Learning Foundation.

Silver, H. (2000) *ELEN: An Evaluation Report.* (Unpublished Report). University of Lincolnshire and Humberside.

Stoner, G. (Ed.) (1996). *LTDI. Implementing Learning Technology.* Heriot-Watt University.

Hobbs, S. (1999). Confounded cultures: the role of evaluators in identifying conflicting expectations in inter-institutional projects, in Oliver, M. (Ed.) (1999) *The Evaluation of Learning Technology.* (Conference Proceedings). University of London, 23-26. http://www.unl.ac.uk/tltc/elt/#reports