



INSPIRAL

**INveStigating Portals for
Information Resources And Learning**

Final Report

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**Final INSPIRAL deliverable to the JISC
by the Centre for Digital Library Research
and the Centre for Educational Systems
University of Strathclyde**

<http://inspiral.cdrl.strath.ac.uk/>



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1. Introduction

1.1 Background

1.1.1 Digital libraries and virtual learning environments

Within the context of changes in society, technology, and education in recent years, there have been two key developments relating to e-learning infrastructure in UK universities and colleges:

- The adoption of virtual learning environments (VLEs) and managed learning environments (MLEs)
- The implementation of digital and hybrid libraries

VLEs are tools which support e-learning through provision and integration of web-based materials, including: learning materials; links to other resources; online communication tools (such as electronic bulletin boards); and assessment tools. When such VLEs are integrated with other information systems and processes of the institution, e.g. student records, the resultant system is generally referred to as a managed learning environment.

While the truly digital library, with all resources and services available online, is still far from being realised, libraries in most UK universities and colleges currently offer their catalogues on-line, many through a standard web-browser. University libraries also offer access to increasing numbers of electronic journals and other on-line information sources, including those provided internally or from remote locations. Virtual versions of library services, such as reservations, registration and reference enquiries, are also starting to be offered, particularly to distance learners. These developments collectively represent the hybrid library, which draws together on-line and physical collections and services, presenting them to the user in a seamless and integrated manner, supported by middleware that handles aspects such as authentication and cross-searching.

1.1.2 The JISC and e-learning: a convergence of evolution

The JISC has been at the forefront of these developments, with the funding of the eLib hybrid libraries programmes, the DNER, and a range of VLE and MLE related projects. Further education (FE) has been brought within the JISC remit also, expanding the scope for research and development.

As a result of evaluations of eLib¹ and the DNER,² and in the light of rapidly growing interest in VLEs/MLEs, the JISC realised that bringing these major developments together to create a truly seamless online learning experience was both necessary and inevitable. As well as funding technical projects such as ANGEL (Authenticated Networked Guided Environment for Learning),³ the need for a thorough analysis of the non-technical, institutional and end-user issues was identified. In March 2001, the JISC put out a request for proposals entitled: *Linking Virtual Learning Environments and Digital Libraries: A Critical Analysis of the Issues*.⁴ The request stated:

"7.This call is for proposals that will critically analyse the key issues relating to the linkage between VLEs and digital libraries at a high level, focusing on institutional issues and with a clear view of the needs of the learner. This call is specifically not requesting proposals to investigate the technical aspects of integration, this work is being done elsewhere.

8.The outcomes of this work will almost certainly also be of interest and relevance to Further Education, however the primary focus and funding for this activity is Higher Education."

¹ See eLib evaluation documents at: <http://www.ukoln.ac.uk/services/elib/papers/other/intro.html>, including Pinfield (2001).

² See CERLIM project EDNER: Formative Evaluation of the DNER, at: <http://www.cerlim.ac.uk/edner/welcome.html>

³ ANGEL is developing middleware to enable seamless integration between learning environments and information resources. See: <http://www.angel.ac.uk/>, Harris (2001) and Paschoud (2001).

⁴ http://www.jisc.ac.uk/pub01/vle_lib_rfp.html

INSPIRAL (INveStigating Portals for Information Resources And Learning), based at the University of Strathclyde, was funded to carry out this work between March and October 2001, in order to inform the next round of funding.

1.2 INSPIRAL's Place within JISC Strategy

1.2.1 The JISC's mission

The JISC's mission is:

“to help further and higher education institutions and the research community realise their ambitions in exploiting the opportunities of information and communications technology by exercising vision and leadership, encouraging collaboration and co-operation and by funding and managing national development programmes and services of the highest quality.”⁵

The INSPIRAL study was intended to prepare the ground for realising the ambitions of these educational communities by finding out what those ambitions are, specific to the integration of MLEs/VLEs and digital libraries.

1.2.2 The JISC's strategy

The *JISC Five-Year Strategy 2001-05*⁶ was made available in the middle of INSPIRAL's project timetable. While INSPIRAL did contextualise its initial research within the previous JISC strategy document,⁷ the new version was more finely tuned to the remit of INSPIRAL, and was reflected closely in the issues raised by INSPIRAL stakeholders.

INSPIRAL touches on several of the twenty-five recommendations⁸ of the new strategy document, and is itself a component of meeting *Recommendation 20*:

"Recommendation 20: The JISC will promote the development of Managed Learning Environments (MLEs) and the use of information learning technology for distance and flexible learning through trialling new technologies, commissioning studies and the further development of Virtual Learning Environments (VLEs) and the DNER."

1.2.3 Background and context to the new strategy

Of the fifteen cultural changes underpinning differences between the new strategy and the previous one⁹, the following five relate directly to INSPIRAL:

- “ * A change in government priorities to place greater emphasis on the needs of non-traditional and non-residential learners [...]
- * An increasing priority to widen participation in further and higher education [...]
- * The development of systems that support joined-up applications within institutions and across educational sectors, particularly to aid student progression [...]
- * The development of regional and other partnerships to provide better integration of work and learning activities
- * New legislation, for instance in the areas of freedom of information, human rights and disability.”

These cultural factors bring to the forefront the necessity of meeting the information needs of part-time, distance, open, workplace, lifelong and disabled learners with the same level of care and quality as for 'traditional', campus-based, full-time students. Therefore, the provision of useful library services and resources within the online learning contexts serving such learners must now be seen as a high priority within post-16 education.

⁵ http://www.jisc.ac.uk/pub01/strat_01_05/exec.html#s2

⁶ See: JISC (2001)

⁷ See: JISC (1996)

⁸ http://www.jisc.ac.uk/pub01/strat_01_05/exec.html#a1

⁹ http://www.jisc.ac.uk/pub01/strat_01_05/exec.html#s5

Furthermore, the JISC's strategy is situated firmly within the wider context of the government's vision "of creating a world leading knowledge economy in the UK."¹⁰ INSPIRAL's role in this vision may be seen in the light of the following UK-wide institutional objectives which the JISC aims to support:

- * Competing successfully in an increasingly global education market [...]
- * Improving efficiency and value for money"

These are areas where the successful and efficient integration of online learning and digital library developments may add value to the provision of education. The JISC's role in building on previous developments, 'joining up' current ones, and preventing reinventing the wheel are of particular relevance here.

1.2.4 The JISC's objectives

The Executive Summary¹¹ of the *Five-Year Strategy* lists nine objectives for the next five years. Two of these objectives relate directly to INSPIRAL's remit:

- * Build an online information environment providing secure and convenient access to a comprehensive collection of scholarly and educational material.
- * Help institutions create and maintain MLEs to support students"

The second of these is further expanded on later in the Strategy¹²:

"Student Support Systems

29. The JISC will be deploying considerable resources to help institutions improve student support and management systems through the development of Managed Learning Environments (MLEs). MLEs provide an integrated approach to the whole range of information systems and processes in an institution, whether based on IT applications or not. Such environments are designed to support the learning experience in a student-focused way. Those elements of an MLE used online are known as Virtual Learning Environments (VLEs).

30. The JISC believes that a step change in appreciating the importance of student support systems, especially through MLEs, is essential if the post-16 sector is to meet the challenge of growing competition, including from overseas."

Library services and resources, whether based on-campus or remotely accessed, are important 'information systems and processes' for the student, and as such, must be part of any vision for a fully integrated MLE.

1.2.5 INSPIRAL as a JISC study

The role of short-term studies¹³ within the JISC's *Strategy* is clear:

"Studies and Evaluations

32. Finally, the JISC will continue to fund a modest programme of studies and pilot projects to help understand the benefits and problems of deploying innovative IT applications within further and higher education.

33. More effective dissemination of lessons learned and studies from the vast range of recommendations and projects carried out world-wide into the application of innovative technologies is needed. The JISC will devote more resources to this through its own advisory services and in collaboration with other agencies.
[...]

¹⁰ http://www.jisc.ac.uk/pub01/strat_01_05/exec.html#s4

¹¹ http://www.jisc.ac.uk/pub01/strat_01_05/exec.html#s3

¹² http://www.jisc.ac.uk/pub01/strat_01_05/exec.html#s10

¹³ http://www.jisc.ac.uk/pub01/strat_01_05/exec.html#s12

35. These studies and evaluations are critical in ensuring that funding (whether by the JISC or others) continues to be led by the needs of institutions rather than being pushed by technology; and that JISC-funded services continue to be effective and provide value for money."

This Final Report has key information and dissemination roles to play in ensuring that the JISC is able to meet the real needs of institutions in supporting the integration of online learning and information provision.

1.3 INSPIRAL's Aims and Objectives

1.3.1 Aims

INSPIRAL's aims were to identify and analyse, from the perspective of the UK HE learner, the non-technical, institutional and end-user issues with regard to linking VLEs and digital libraries, and to make recommendations for JISC strategic planning and investment.

1.3.2 Objectives

INSPIRAL's objectives were:

- 1.3.2.1 To identify key stakeholders with regard to the linkage of VLEs, MLEs and digital libraries
- 1.3.2.2 To identify key stakeholder forum points and dissemination routes
- 1.3.2.3 To identify the relevant issues, according to the stakeholders and to previous research, pertaining to the interaction (both possible and potential) between VLEs/MLEs and digital libraries
- 1.3.2.4 To critically analyse identified issues, based on stakeholder experience and practice; output of previous and current projects; and prior and current research
- 1.3.2.5 To report back to JISC and to the stakeholder communities, with results situated firmly within the context of JISC's strategic aims and objectives.

1.3.3 Deliverables

INSPIRAL's key deliverable is this Final Report. Interim deliverables included the project web site, open discussion list, reports on the individual study activities, an online bibliography, and an interim progress report to the JISC.

1.4 INSPIRAL's Methodology

INSPIRAL was a qualitative study, involving three phases: issue capture; analysis; and dissemination of results. These phases were not discrete; each fed into the others. For instance, stakeholders inevitably contributed to the analysis during the issue capture phase, and dissemination of the study's results throughout the project fed back into the first two phases, enabling more issues to be raised and further discussion and analysis to occur.

1.4.1 Initial issue capture phase

1.4.1.1 Identifying key stakeholders

Stakeholders were identified within three major areas: the first priority being the learners; secondly, institutions and staff at all levels within higher and further education; and finally, commercial suppliers of software, services and content. Initial publicity regarding INSPIRAL via press releases, an article in *Ariadne*, and online mailing lists drew much interest from the second two communities, with over eighty subscribers to the INSPIRAL JISCmail list within the first week. A range of interested parties were asked to become official stakeholders of INSPIRAL,¹⁴ and were encouraged to take part in as many of the study's activities as possible.

¹⁴ See **Appendix 2: INSPIRAL's Stakeholders**, also available on the web site at: <http://inspiral.cdli.strath.ac.uk/about/stakeholders.html>

Identifying learners willing to take part was more problematic, not least because most learners were on summer break during the INSPIRAL timetable. Those learners that did take part were identified and contacted via teachers of online courses, and the INSPIRAL discussion list.

1.4.1.2 Consulting the stakeholders

Seventeen stakeholder interviews were carried out, using three structured interview plans, the results of which were summarised in the *INSPIRAL Stakeholder Consultation Stakeholder Interviews Summary Report*.¹⁵ The results of three interviews with learners, and the INSPIRAL Learner Forum in Glasgow, are summarised in the *INSPIRAL Learner Consultation Report*.¹⁶ Two half-day INSPIRAL Forums aimed at the educational community were held in Glasgow and London. Reports from these are available on the web site.^{17 18} Additionally, various key issues were raised and debated throughout the project on the INSPIRAL JISCmail discussion list.¹⁹ The results of the stakeholder consultation are presented in section **5. Critical / Key Issues**.

1.4.1.3 Literature review

The *INSPIRAL Literature Review*²⁰ and the *INSPIRAL Bibliography*²¹ resulted from this activity. While very little had been written prior to 2001 about linking or integrating digital libraries with online learning, the literature provided substantial background to and support for the findings of the stakeholder consultation, particularly in the area of institutional and professional role changes as a result of e-learning developments. It also brought to light potential case studies. The literature review is also summarised in section **3. Literature Review** and the bibliography is available as **Appendix 1: INSPIRAL Bibliography**.

1.4.1.4 Identifying appropriate case studies

Finding appropriate case studies, where some effort had been made to link or integrate libraries and online learning, proved to be difficult at the beginning of the project, due to the lack of work that had been carried out in this area. In the end, six case studies were identified, including four from UK HE, one from UK FE, and one from HE in the US. Additionally, a document listing eight brief exemplars of current practice in online learning / library integration was compiled for the use of INSPIRAL's stakeholders. These documents are all available on the web site.²² They are summarised in section **4. Case Studies and Best Practice Exemplars**.

1.4.1.5 Researching issues outwith the UK

INSPIRAL included an advisor from the USA on the Steering / Advisory Group. One American case study was carried out,²³ and developments in the USA, Australia and Scandinavia were looked at via the literature review and other desk research. See section **7. The UK and the US: A Comparison**.

1.4.2 Analysis phase

¹⁵ Sarah Currier. *INSPIRAL Stakeholder Consultation: Stakeholder Interviews Summary Report*. 17 August 2001. <http://inspiral.cdjr.strath.ac.uk/documents/documents.html>

¹⁶ Sarah Currier. *INSPIRAL Learner Consultation Report*. October 2001. <http://inspiral.cdjr.strath.ac.uk/documents/Intrepv2.pdf>

¹⁷ Sharron Brown. *Report from the First INSPIRAL Forum, held at the University of Strathclyde, Glasgow, June 12, 2001: Forum Theme- Visions and Barriers to the Linkage of VLEs and Digital Libraries*. June 2001. <http://inspiral.cdjr.strath.ac.uk/documents/forumrep1.html>

¹⁸ Sarah Currier and Sharron Brown. *Report from the 2nd INSPIRAL Forum, held at Parsifal College, Open University, London, July 10, 2001: Forum Theme- Prioritising Stakeholder Issues*. July 2001. <http://inspiral.cdjr.strath.ac.uk/documents/forumrep2.html>

¹⁹ See INSPIRAL discussion list archive at: <http://www.jiscmail.ac.uk/lists/inspiral.html>

²⁰ Sharron Brown and Sarah Currier. *INSPIRAL Literature Review*. November 2001. <http://inspiral.cdjr.strath.ac.uk/documents/documents.html>

²¹ Sharron Brown and Sarah Currier. *INSPIRAL Bibliography*. November 2001. <http://inspiral.cdjr.strath.ac.uk/resources/bibliography.html>

²² <http://inspiral.cdjr.strath.ac.uk/documents/casestudies.html>

²³ Sharron Brown and Sarah Currier. *INSPIRAL Case Study 6. University of Tennessee Libraries*. November 2001. <http://inspiral.cdjr.strath.ac.uk/documents/casestudies.html>. See also Brief Exemplars 4, 5 and 7 from: Sarah Currier. *Brief Exemplars*. November 2001. <http://inspiral.cdjr.strath.ac.uk/documents/casestudies.html>

In addition to discussion and feedback via the open JISCmail list, presentations, conferences and seminars, the two INSPIRAL workshops carried out this function. The following speakers at the workshops presented findings from other relevant work:

- Nicole Harris (ANGEL Researcher). "ANGEL Formative Evaluation".²⁴
- Martin Jenkins (UCISA Teaching, Learning and Information Group Chair). Interim findings of the UCISA study "Management and Implementation of VLEs within Universities and Colleges".²⁵
- John MacColl (Co-Director of ANGEL and Director of Edinburgh University's SELLIC Project). "Virtuous Learning Environments: How to make Library Systems and VLEs Interoperate".
- Richard Mobbs (Head of the Learning Technology Team at the University of Leicester) "Virtual Learning Environments, Libraries and Institutional Change".
- Ruth Jenkins (Birmingham University). Findings of the BUILDER Project.²⁶
- Claire Ryan (University of Leeds). Findings of the Nathan Bodington Building and the Virtual Science Park VLE/hybrid library integration projects.²⁷

Reports from these workshops, including links to the above presentations, are available on the web site.^{28 29}

1.4.3 Dissemination throughout project

1.4.3.1 INSPIRAL web site

The INSPIRAL web site has been the focal point for dissemination. All research activities were documented via the site with full written reports. Press releases, articles, presentations, project documentation, and other information were all posted there as soon as they were completed, and announced on the discussion list.

1.4.3.2 Open discussion list

As well as being a forum for informing stakeholders of INSPIRAL's progress, the INSPIRAL open JISCmail list was used by stakeholders to discuss various issues which had arisen throughout the INSPIRAL project. The success of this list in promoting such discussion was notable. The INSPIRAL team did promote such use, but no more than is usual for a project discussion list. It was clear that the stakeholders were keen to use this venue to discuss matters of importance for them. Stakeholders from various areas of education took part in the discussions, and the list archive is a valuable resource.³⁰ The list now has over 200 members, and will continue to run indefinitely beyond the end of INSPIRAL.

1.4.3.3 Press releases, articles, presentations, and conference papers

These are all available from, or referenced on the web site. The two original press releases were tailored for the library and information community and the academic/learning technology communities respectively, each more fully explaining the aspects of INSPIRAL likely to be unclear to their audience.

²⁴ See also: <http://www.angel.ac.uk/>, Harris (2001) and Paschoud (2001).

²⁵ Draft version of the full UCISA report should be available on the UCISA TLIG web site (<http://www.ucisa.ac.uk/>) by mid-November.

²⁶ See also BUILDER web site: <http://builder.bham.ac.uk/>

²⁷ See also section **4.3 University of Leeds Nathan Bodington Building** and: Sarah Currier. *INSPIRAL Case Study 3: University of Leeds Nathan Bodington Building*. November 2001. <http://inspiral.cdjr.strath.ac.uk/documents/casestudies.html>

²⁸ Sarah Currier and Sharron Brown. *Report from the 1st INSPIRAL Workshop, held at the Kimberlin Library, De Montfort University, Leicester, August 21st, 2001: Identification of Priorities and Solutions for VLE/MLE and Digital Library Integration*. August 2001. <http://inspiral.cdjr.strath.ac.uk/documents/workshopleicester.pdf>

²⁹ Sharron Brown and F. Cuna Ekmekioglu. *Report from the 2nd INSPIRAL Workshop, held at the Main Library, University of Birmingham, Birmingham, September 4th, 2001: Identification of Priorities and Solutions for VLE/MLE and Digital Library Integration*. September 2001.

<http://inspiral.cdjr.strath.ac.uk/documents/workshopprepbirm.pdf>

³⁰ <http://www.jiscmail.ac.uk/lists/inspiral.html>

2. INSPIRAL's Stakeholders: Stakeholder Groups and Their Characteristics Relevant to VLE / Digital Library Linkage

A full list of INSPIRAL's official stakeholders may be found in **Appendix 2**, and on the web site.³¹ The results of the stakeholder consultation exercises as detailed in **1.4 INSPIRAL's Methodology** are summarised in section **5. Critical / Key Issues**.

The main stakeholder groups identified by INSPIRAL are:

- Learners
- Educational institutions:
 - UK HE Institutions
 - UK FE Institutions
 - Non-UK institutions
- Groups and staff members within educational institutions:
 - Academics and other teachers
 - Libraries and librarians
 - Hybrid and digital library services
 - Staff developers and staff development departments
 - Learning technologists and learning technology units
 - Educational developers and educational development units
 - Distance, flexible, open, and lifelong learning departments
 - Systems support units and staff
 - Researchers
 - Administration departments.
- Other education-related bodies:
 - Government departments and bodies
 - Funding bodies
 - Professional bodies
 - Consortia
 - Educational support bodies such as the LTSN centres and the national libraries
- Commercial organisations:
 - Library, VLE and MLE system/software suppliers and vendors
 - Content providers.

2.1 Learners

Learners are the central stakeholders to INSPIRAL, for it is their needs that the education system is primarily there to meet, and through them the wider needs of society. The key characteristic of learners with regard to VLE / digital library linkage is their diversity. More and more learners are learning from home, from their workplace, part-time, or from a geographical distance to their course. They are coming from all age groups, and are learning throughout their lives. They are coming to university expecting more, based on their experiences with the Internet and other C&IT. There is no longer a typical HE learner. Where library and information resource support to teaching was once comfortably housed in a library building, that support must now be provided to all students regardless of the medium or location of their learning. Further analysis of learner needs can be found in section **3.5 Learner Needs** and section **6. Learner Needs and Priorities**. Additionally, two of the INSPIRAL case studies carried out learner evaluations (3 and 4), see section **4. Case Studies and Best Practice Exemplars**.

2.2 Educational Institutions

Educational institutions throughout the world are being forced to meet new challenges, thanks to changes in society and technology. World wide, technology has increased the aspirations of many, while public money available for educational provision has been squeezed. Within the UK, the government's focus on education, community-based learning and lifelong learning, and the abolition of

³¹ <http://inspiral.cdlr.strath.ac.uk/about/stakeholders.html>

student grants and introduction of fees impacts on both universities and colleges. Institutions are providing more and more distance learning, which enables them to demand fees without increasing physical space for students. However, when people are paying directly for their education, they expect good service, and this means information service provision equivalent to that provided for campus based learners.

2.3 Groups and Staff Members within Educational Institutions

Advances in e-learning technologies, and changes in society, are exerting their pressures on these groups as well. Traditional professional roles are evolving, and there is increased need for continuing professional development and training to keep up. The institutions which employ these staff are being driven by economic factors more than ever; higher education in particular is no longer the safe ivory tower. The use of short-term contract staff, with their attendant anxieties about careers and finances, is particularly prevalent in the realm of learning and information technologies. These increased tensions may exacerbate the competition, territorialism and lack of understanding between professional groups, while at the same time they are being required to collaborate more closely than ever before. All of these groups have their own important role to play in the integration of libraries and online learning; whether or not they are utilised to their best advantage appears to depend as much on the strategic support they receive from above as on their own individual and group willingness to move forward positively.

2.4 Other Educational Bodies

These bodies have a vital part to play in enabling the development of VLE / library integration. In their roles of guiding, supporting, strategically planning, funding and evaluating educational enterprises, it is incumbent upon them to ensure that the needs of learners (and through them society) are the central factor in the development of educational provision. They also have fiscal responsibilities to the taxpayers and professional groups that support them. It is at this level that preventing duplication of effort and reinventing of wheels must be ensured. Additionally they themselves can become exemplars and leaders for their own stakeholders of strategic vision, collaboration between professional groups, and good information management.

2.5 Commercial Organisations

In the realms of online educational information provision and e-learning, commercial interests are often painted as the 'bad guys', mounting obstructions at every point to effective provision. However, it must be remembered that it is in these companies' interests to respond quickly and efficiently to the needs of their customers, and that those customers must make their needs known. Concerns about lost revenue are entirely valid from their own perspective. Communication between them and the above named groups is vital for both sides. The success of ventures like the HERON Service³² show that collaboration is possible. Possible dangers to education could include the development of monopolies, by both content providers and VLE suppliers, which could impact upon the academic freedom necessary to the educational sector.

3. Literature Review

3.1 Introduction

"Every culture must negotiate with technology, whether it does so intelligently or not. A bargain is struck in which technology giveth and technology taketh away. The wise know this well, and are rarely impressed by dramatic technological changes, and never overjoyed."³³

At the time INSPIRAL began, there had been little written specifically on integrating library resources and services with VLEs and MLEs. However, there has been a wealth of research and thinking in recent years around the wider context for INSPIRAL, particularly in the areas of technology, learning and the related institutional changes within higher education. The literature review gave an overview of

³² <http://www.heron.ac.uk/>

³³ Postman, N. *Technopoly*. New York: Alfred Knopf, 1992. Quoted in Burge (1996).

the relevant online learning and digital library developments in higher education, and of the wider context of institutional and learner issues of relating to the implementation of learning technologies.

This section summarises the full literature review document that appears on the web site.³⁴ **Appendix 1: INSPIRAL Bibliography**³⁵ expands on this review with a more extensive listing of the relevant literature.

3.2 Overview

Two main themes dominate the recent literature regarding the impact of technology on teaching and learning: an increased awareness of the changes occurring in the traditional education system; and the recognition of a need for effective and efficient management of these changes. Foster et al. (1999) identified the prime motivator in the acceptance of technology into the education system as being "external forces,"³⁶ which have the power to influence institutional decisions. Significantly, Edwards (1997), while noting that change is inherent in many areas of society today and not specific to educational institutions, has stated that within the education sector the environment most prone to technology dictating change is in fact library and information services. Ultimately it is wider societal factors that have influenced and under-pinned e-learning developments in UK higher education.

3.3 The Dearing Report

In July 1997 the National Committee of Inquiry into Higher Education (NCIHE, 1997) produced its *Report of the National Committee* (known as the Dearing Report), which made recommendations for higher education in the UK over the next twenty years. This report recognised the importance of communication and information technology (C&IT) as central to the progression of the national education system, stating:

"The innovative application of ... communication and information technology holds out much promise for improving the quality, flexibility and effectiveness of higher education. The potential benefits will extend to, and affect the practice of, learning and teaching research."

This report was the precursor to, and basis for, the wide-ranging efforts in education in the UK to encompass learning technologies in a useful way, including those of the JISC.

3.4 Institutional Issues

3.4.1 The role of senior management

The need for more forward thinking leadership from senior management was identified in the Dearing Report (NCIHE, 1997), which stated:

"The full exploitation of C&IT by higher education institutions will require senior management to take an imaginative leap in devising a strategy for their institutions, which can bring about this change."

Mogey (1997) has stated that along with the understanding that pedagogy is a more important factor than technology, senior management should also be aware that the inclusion of a VLE/MLE should not be done on the basis of presumed immediate financial gain. Agre (2000) discusses the potential dangers to the institutional infrastructure if the implementation of networked services is not appropriately realised. Important factors include: choosing the right approach to meet user needs; implementation of the correct standards to suit institutional needs rather than to be a vehicle for control by outside agencies; and providing motivation and encouragement for staff. All of these require strong leadership and long term strategic planning.

³⁴ Sharron Brown and Sarah Currier. *INSPIRAL Literature Review*. November 2001. <http://inspiral.cdli.strath.ac.uk/documents/documents.html>

³⁵ Also available at: <http://inspiral.cdli.strath.ac.uk/resources/bibliography.html>

³⁶ Foster et al. (1999) quoting Fullan's principles of the three main sources of change: "natural disasters", "internal contradictions", and "external forces".

Furthermore, Pollock and Cornford (2000) have noted that bottom-up, course-by-course or departmental adoption of VLEs is likely to be a labour intensive exercise, time consuming, and prone to failure. MacDougall (1998) echoes this view and re-emphasises the way in which "unenlightened senior administrators and managers" could be a serious threat to quality information provision to learners and society as a whole.

These views are supported by the lessons from the eLib Programme (Pinfield, 2001), including the following observation:

"2.10.4 The support of senior LIS and institutional managers is essential. As the HyLiFe project³⁷ has pointed out, it is useful for projects to have a 'champion' at senior levels of the institution. The support of a manager with 'clout' can help ensure the project is allowed to develop rapidly and also help ensure that project outcomes are embedded in the organisation."

The literature therefore is in apparent concordance with INSPIRAL's stakeholders in saying that for effective and efficient linkage of VLEs/MLEs and digital and hybrid libraries, senior university management must support from above with long term strategic planning, identifying their own specific cultural, social and educational requirements.

3.4.2 Changing professional roles

As Pinfield (2001) pointed out in his paper on lessons learned from eLib:

"2.12.2 The development of the hybrid library requires LIS staff to work in partnership with academic colleagues. LIS staff are increasingly becoming more directly involved in learning and teaching issues. Communication and liaison mechanisms should be strengthened. LIS staff should ensure they have an input into learning and teaching and research strategy.

[...]

2.12.4 Partnership with other support services, especially the computing services, are crucial for the development of the hybrid library."

According to the literature, this element of collaboration between professional groups, and resolving the attendant anxieties and problems created, is crucial to the success of online education.

3.4.2.1 Libraries and Librarians

Jackson (1997) reported on the findings from IMPEL2³⁸, an eLib project carried out between 1996 and 1997 at the University of Northumbria. This project studied the impact of resource based learning on library staff, and concluded that, for resource-based learning to flourish the following developments are needed:

1. Greater acceptance of the key role of library staff and more involvement of library staff in institutional structures
2. The development of the para-academic role of librarians in user education and training
3. An increase in staff training and development in technological skills and uses of IT based resources and those areas relating to people such as customer care, communications, team working and teaching and learning skills."

Alexander (2000) and MacColl (1999) of Edinburgh University's SELLIC (Science and Engineering Library, Learning, and Information Centre) Project,³⁹ both acknowledged the importance of the inclusion of library resources and staff in online learning, with Alexander (2000) noting SELLIC's role as encompassing:

³⁷ <http://hylife.unn.ac.uk/summary.htm>

³⁸ http://online.northumbria.ac.uk/faculties/art/information_studies/impel/

³⁹ <http://www.sellic.ed.ac.uk/>

"... the traditional principles of librarianship: that resources must be properly described and arranged within information retrieval systems, and it is working to assert the Library's role in managing the learning resources of the University."

Kovel-Jarboe (2001) is among the academic authors who acknowledge the potential for the linkage of VLEs/MLEs and digital libraries to produce additional and innovative ways to enhance the teaching and learning experience, while acknowledging an added likelihood for blurring of and uncertainty over professional roles within an institution.

Due to the fact that the integration of digital library resources within the teaching environment is likely to draw heavily upon the experience of library staff, authors such as Pinfield and Hampson (1999), Pinfield (2001a), Davies (1997), MacDougall (1998), and Edwards (1997) have explored the changing of roles within the information sector. Increased responsibilities of library staff may mean they are required to teach new information retrieval skills, as well as provide content development and input, deal with legal matters, maintenance and evaluation of the new learning materials. Edwards (1997) also uses evidence from IMPEL2 and suggests that uncertainty occurs when institutions had undergone or were undergoing organisational change. Davies (1997) has highlighted how library staff may either feel confused or threatened as learner skills develop. Alternatively, staff in institutions with well established electronic resources found that learners developed new demands in the search for quality learning materials, effectively increasing the demands on them. However, as Pinfield (2001a) points out, particularly with regard to subject librarians, whom he sees as having a vital role to play in working with academics in promoting learning:

"The library is first and foremost a service. Its primary mission is to support the learning and teaching and research activity of its parent institution by providing access to information resources. Subject librarians [...] can help to ensure that the service is directed at existing user needs and also be instrumental in developing and implementing new services that proactively address changing user needs. This applies in the new electronic library environment just as it has always done in the traditional library."

Furthermore, in exploring the developing partnership model of information service provision, Pinfield and Hampson (1999) name the three important roles of information professionals:

- " * Service providers
- * Partners
- * Innovation leaders."

3.4.2.2 Teachers and Teaching

With regard to teaching methods and reaction to change, Jaffee (1998) has commented on the way in which:

"in academia, obstacles to change are closely associated with the established practices and cultural traditions of the teaching faculty."

Similarly, Browne (1999) identifies that:

"academics are likely to recognise conceptual shifts within the subject, [while] support staff will be most alert to IT developments."

Research into the reasons behind resistance to change by academic staff when information technology is integrated into teaching practice has been carried out at the University of Brighton (Sosabowski, Herson and Lloyd, 1998) and the University of Southampton (Maier, White and Barnett, 1997) where barriers were identified as a lack of technical knowledge, recognition, incentives and clear IT policies at institutional level, as well as negative perceptions of moving away from traditional styles of teaching.

What is more, Edwards (1997) has reported how library and information staff held the perception that many academics appeared to be unhappy with their involvement in the provision of course materials, and that their status was viewed as lower within the institution.

3.4.3 Pedagogy

Professional uncertainty is clearly a major problem for institutions to address. For teaching staff, part of this is concern over the issue of pedagogy. How academics approach the new teaching possibilities that emerge is important if the learning experience is to be enhanced. It is also important to them that they not have their pedagogical approach dictated by the technology. Lee and Thompson (1999) emphasise a focus on educational needs rather than on the technology and that "staff needed to identify how they wanted to teach before selecting the technologies."

Bull and Zakrzewski (1997) have warned that any learning technology that is not properly integrated into course work is unlikely to be well rated and therefore used by the learners. This has obvious implications for the library profession; it is not only a priority to understand the academics' viewpoint on the importance of pedagogy, but also to ensure that library resources are well-integrated into all areas of online learning.

3.5 Learner Needs

Boddy and Tickner (1999) have commented that:

"before designing the technological aspects of the learning environment, educators and designers should best begin by analysing the actual activities learners engage in during a course."

Furthermore, Pinfield et al. (1998) have pointed out that information requirements, IT skills and work patterns are likely to vary depending on the type of learner and can vary drastically between full and part-time learners, school leavers and mature students, and campus-based and distance learners.

Lee and Thompson (1999) have identified four concerns that apply to both staff and students in distance online learning and are therefore prime issues for institutional concern:

- Equity: how to ensure that all learners are treated equally.
- Participation: how to ensure that all learners are actively involved in online learning.
- Teaching: will the distance factor/online factor compromise the teaching element of the course
- Workloads: what additional resources will be needed and will this mean more time will need to be allocated to online courses.

This is particularly of interest considering the work of Davison, Bryan and Griffiths (1999), which states that due to learners approaching learning and technology in a way that is influenced by their learning style, so teachers are likely to approach teaching according to their own individual learning style, possibly to the disadvantage of some learners. Burge (1996) notes how learning styles may also be influenced by social factors, particularly in the case of adult learners, who may need to become "self-responsible" in the new learning environments, essentially moving away from traditional roles of teacher and learner and concepts of power relations. The changing concept of the learner has been summarised by Twigg (1995), who wrote:

"Tomorrow's students will resemble today's research faculty and will possess qualities of increased independence and self-reliance. No longer will students be passively taught by teachers who organize the learning experience for them. Students will learn how to find and use learning materials that meet their own individual learning needs, abilities, preferences, and interests; they will learn how to learn. Faculty will encourage and guide students to use the rich information resources available to students and to work collaboratively when appropriate."

Various studies have also attempted to analyse the pros and cons of on-line education from the learner's perspective. A 1996 study at California State University, Northridge, which compared traditional learning and virtual learning, suggested that learners in the virtual learning environment scored around 20 per cent higher on two exams and that the virtual learning environment actually produced more peer

contact and interaction (Schutte, 2001). However, a case study carried out in 1997 (Hara and Kling, 1999) examined several major U.S. universities and investigated the "frustrations" that learners experience while taking on-line courses, the three main sources of which were identified as:

- " * Technological problems;
- * Minimal and not timely feedback from the instructor; and,
- * Ambiguous instructions on the web site as well as via email"

Furthermore, these frustrations were identified as potential reasons why learners were likely to drop out of on-line education. Therefore, while institutions may be aware of the research in learning styles and learner needs there still may exist factors that can be identified as potentially dangerous to the learning experience of the individual. Leopold-Lüsman (2000) viewed one reason behind these frustrations to be a lack of collaboration between technical design and tutor at the level of course development.

3.6 Conclusions

In identifying potential problems to embedding learning technologies, potential solutions and supportive factors can also be found. A recent JISC funded report on career development for learning technology staff (Beetham, Jones and Gornall, 2001), found that institutions that were considered to be exemplars of good practice in learning technology innovation had the following factors in common:

- Good collaborative networks
- Targeted support for teaching staff to integrate LTs into their courses
- Department/service teams with their own local planning to meet strategic aims
- Specialist learning technology development teams within computing services
- A requirement on programmes of study to address student C&IT skills
- A requirement on departments to demonstrate pedagogical research/scholarship of teaching.

Ultimately, however, in implementing learning technologies, it must be remembered that the technology is a means to an end; the provision of high quality learning. The postmodernist perspective of Marshall McLuhan, who famously stated that the medium is the message, was challenged by Fraser (1997) thus:

"Resource-based learning in general has an advantage of including within it printed works, computer-based materials, and resources in other media forms. Resource-based learning, rather than computer-based learning draws attention away from the medium and back to the content, assuming that a 'resource' has something inherently useful about it."

Overall, the literature reviewed here would appear to support most of the institutional and learner issues identified in the rest of INSPIRAL's study as important factors in the effective integration of library services and resources into virtual and managed learning environments. These are: that changing roles and lack of vision from above are key barriers to implementation, and that strategic vision, staff development and collaboration are key success factors. Awareness of the diversity of learners' needs is also of vital importance, particularly with a view to how they learn online.

4. Case Studies and Best Practice Exemplars

According to one writer, the essence of a research-based case study is:

"that it tries to illuminate a decision or set of decisions: why were they undertaken, how were they implemented, and with what result."⁴⁰

⁴⁰ Schramm, W. *Notes on case studies of instructional media projects*. Washington, DC : Academy for Educational Development, 1971, quoted in: Yin, R. *Case study research: design and methods*. 2nd ed. London : Sage, 1994.

The cases studied by INSPIRAL took this approach, and each to some extent illustrates or exemplifies the issues and problems which have been uncovered in other areas of INSPIRAL's work. Full versions of each case study are available on the INSPIRAL web site.⁴¹

It was recognised early on in INSPIRAL that any best practice exemplars were likely to emerge from the search for potential case studies, so both deliverables are included in this section. The elements of best practice found in the case studies are based upon the institution achieving some part of the vision for integration as detailed in section **5.1 The Vision**.

When INSPIRAL began, the literature review and other investigations revealed that little practical work had been done in the area of integrating or linking digital libraries with VLEs. Over the course of the project, various institutions developing such endeavours came to light. However, most of them were in the very early stages of implementation, and were themselves hoping that INSPIRAL would inform their developments. In the end the case studies virtually chose themselves, as the only examples of working linkage or integration between VLEs and libraries found. Fortuitously, they cover a range of possible approaches to learning, use of software and types of institution, including two old universities, two new universities, one FE college and one American university. Geographically they cover England (north and south), Scotland and abroad. Two have developed their own in-house VLEs, while four are using commercial products, including the popular WebCT and Blackboard. The courses supported are professional, post-graduate, undergraduate, staff development, community-based, distance and campus-based. Subject areas covered include: business and commerce, information science and IT, engineering, health and medicine, tourism, publishing, law, social sciences, education, geography, philosophy and key skills. Two of them ran pilot projects for which they carried out user evaluations.

The case studies are:

- The Robert Gordon University Virtual Campus Library
- The University of London Virtual Campus Project
- The University of Leeds Nathan Bodington Building
- Edge Hill College of Higher Education: Post-Graduate Certificate in Teaching & Learning in Clinical Practice (Introductory Module)
- Harlow College: HOLLi (Harlow On-Line Learning Initiative) and COLLi (College On-Line Learning Initiative)
- University of Tennessee Libraries.

4.1 Robert Gordon University Virtual Campus Library

4.1.1 Overview

- New university based in Aberdeen, Scotland.
- VLE serves distance learners world-wide.
- Commercial VLE: ESRI Virtual Campus (U.S.-developed).
- Plans to carry out user-satisfaction evaluation.

4.1.2 Elements of best practice

- High-level support for library integration from Director of Centre for Open and Distance Learning (CODL), Chief Librarian, University Secretary.
- Close collaboration between library and CODL. Began with secondment of librarian to CODL. Now ongoing dedicated library staff member. Set up Distance Learning Working Group consisting of librarians and CODL staff member.
 - Collaboration has resulted in library staff, who were originally sceptical, becoming enthusiastic as they saw services to distance learners improve. Staff at the CODL have learned about the complexity of library services, and the kinds of resources and services that can be offered.
- Full range of library services and resources available online, including registration, reserves and requests for postal loans, checking borrower records and renewals, user education and training,

⁴¹ The full case study documents are available on the INSPIRAL web site at:
<http://inspiral.cdlr.strath.ac.uk/documents/casestudies.html>

reference service, web guides and other online resources tailored to specific subject areas, HERON service for digitised readings, NetLibrary for eBooks.

4.1.3 Additional issues

- The Virtual Library is not completely seamless; users must log-in to the Library OPAC separately via Telnet.
- Document delivery and ILL are not completely online. Because physical signed copies of copyright clearance forms are needed, requests must be printed off and posted in.
- Books may not be requested by ILL. Reference and short loan collections may not be borrowed. However, the RGU offers the UK Libraries Plus scheme to enable users to use a library near them.
- Overseas students only have access to online materials, or photocopies of articles and chapters.
- Learning outcomes evaluation not planned.

4.2 University of London Virtual Campus Project

4.2.1 Overview

- Old university, federation of seventeen self-governing colleges, based in London.
- VLE serves distance learners world -wide.
- VLE developed in-house.
- Pilot service. Learner and staff evaluation ongoing.

4.2.2 Elements of best practice

- High-level support enabled this collaborative venture between the distance learning, computing and library services of the University.
- A dedicated project team, based in the Library, has been appointed, including a full-time co-ordinator and a full-time assistant.
- Began with a pilot service, to be expanded to cover all distance learners. Evaluation integral to process, using range of qualitative and quantitative methods, including both learners and staff
- A dedicated library staff member with a dedicated phone line is provided for distance learners.
- Academic staff are consulted and included regularly via a user group with an online discussion list and face-to-face meetings.
- Wide range of library services and resources are available online, including enquiries and reference, user education, a full virtual reference collection, online resources arranged by discipline and course.
- Aiming for complete seamlessness, on and off-campus.

4.2.3 Additional issues

- Required readings are not included. This is because of internal infrastructure; required readings are provided by the individual college involved.
- No mention is made of reservations, registration, user records and renewals, or ILL online.
- Learning outcomes evaluation not planned.

4.3 University of Leeds Nathan Bodington Building

4.3.1 Overview

- Old university, based in Leeds.
- VLE/library integration pilot serves undergraduate, on-campus learners.
- VLE developed in-house (now available as open source software).
- Original pilot evaluated via learner survey and interviews with teachers.

4.3.2 Elements of best practice

- High-level support from Library, idea spear-headed by enthusiastic librarians, Library supplied funding for project.
- Library staff worked closely with teachers on modules.
- Built on Library's strong e-resource collections and infrastructure.
- Began with module-level pilot, with evaluation integral, including both staff and students.
- Provided tailored library resources including reading lists linked to full-text or the Library catalogue, digitised core readings (one module only); access to Library catalogue; links to online resources, including DNER/RDN resources.

- Provided library services, including user education, contact details, e-mail enquiry desk, videoconferencing facility.
- Plan for future to evaluate for teaching and learning outcomes.

4.3.3 Additional issues

- Level of granularity of resources / services still to be addressed.
- Exploring integrated links to national services and developments.

4.4 Edge Hill College of Higher Education: Post-Graduate Certificate in Teaching and Learning in Clinical Practice (Introductory Module)

4.4.1 Overview

- New university, based near Preston and Liverpool.
- VLE/library pilot serves post-grad, CPD distance learners.
- Commercial VLE: WebCT.
- Learner evaluation of original pilot carried out and changes made as a result to improve service.

4.4.2 Elements of Best Practice

- Close collaboration between library, teaching & learning unit, online course developers and teachers.
- Strong support for staff whose roles were changing; online staff development courses.
- Library resources and services provided included: tailored access to online resources; information and advice on access to physical resources and services such as ILL; specific resources embedded in course content; support offered online, face-to-face at introductory session and as printed materials; access to search engines and web guides; user education.
- Conscious effort to ameliorate learning styles difficulties by providing face-to-face support and printed materials.

4.4.3 Additional issues

- All services (such as reserves and ILL) not provided online.
- Learning outcomes evaluation not planned.

4.5 Harlow College: HOLLi (Harlow On-Line Learning Initiative) and COLLi (College On-line Learning Initiative)

4.5.1 Overview

- FE college, based in Harlow.
- VLE used for community-based learning, then to support face-to-face teaching in college.
- Commercial VLE: Teknical's Virtual Campus (UK-developed).
- No user evaluation as yet.

4.5.2 Elements of Best Practice

- College librarian one of three VLE Campus Managers; has had input from day one and has collaborated closely with non-library users.
- Tailored web links are included in VLE.
- Library staff have been used to select tailored web resources for VLE.

4.5.3 Additional issues

- No other library resource or service has been integrated with VLE.

4.6 University of Tennessee Libraries

4.6.1 Overview

- US-based university, federation of fifteen colleges and schools across Tennessee.
- VLEs used for distance online learning and evening classes.
- Commercial VLEs: Centra Symposium for distance learners and Blackboard CourseInfo for Evening School.

4.6.2 Elements of Best Practice

- Dedicated Off-Campus Librarian who offers support, research, book and article requests, and reference services to all off-campus students, including by telephone, fax, e-mail, web-based videoconference and a live chat enquiry service.
- The main Library offers a live chat and e-mail reference service, access to online catalogues, indexes and databases, online ILL and document service, online user education (including via live television instruction).
- The Internet eLearning Institute (IEI), which uses the main VLE for distance learners, includes a Virtual Campus page, which includes a link to the library web site.
- Each individual course VLE within the IEI has a Library button, which also links to the Library web site.
- The VLE allows the tutor or student to take the rest of the participants to different web sites, online, through the Web Safari function.

4.6.3 Additional issues

- The Off Campus librarian's service does not appear to be very well integrated with the main Library web site and services; at least this is how it appears from looking at the site.
- The Off Campus Librarian is not linked to or referred to from the VLEs either.
- Specific information resources for each course or module are not embedded in the VLE.

4.7 Conclusions

It is apparent that the four UK HE-based library / VLE integration services studied have thought to some degree about the critical issues and vision for online learning also identified by the rest of INSPIRAL's stakeholders. They exemplify the idea that high-level support and collaboration are the key factors in building a successful integrated online learning experience. The one element that is missing from all, except for within the final observations noted at Leeds University, is evaluation of the teaching and learning impacts of library resource and service integration within online learning. This is something that would go some way to opening teachers' minds to the inclusion of librarians and libraries in their online teaching initiatives, as well as enabling the improvement of services.

5. Critical / Key issues

The key issues identified by INSPIRAL's stakeholder consultation and other research constitute a vision for an ideal VLE/digital library integration scenario, and perceived potential problems and barriers to be overcome.

5.1 The Vision

The vision for an ideal fully integrated online learning environment included the following areas:

- Seamless, one-stop access
- All library functions online
- Individualisation for the learner
- Flexibility for the teacher
- Universal accessibility
- Ease of use

Certain caveats were expressed regarding all of these ideas, usually by the more experienced e-learning experts, although no one seriously disagreed with any of them.

5.1.1 Seamless, one-stop access

This includes seamlessness between the learning environment and the library or information resources at any point in the VLE and seamlessness within one user's portal across different courses, departments or even institutions. The most important aspect of this was the single sign-on; one authentication procedure, regardless of whether the user is accessing the VLE from on- or off-campus, is the ideal.

Warning notes which were sounded included potential problems with seamless cross-searching of different databases, indexes and other information resources.⁴² Lack of interoperability of search vocabularies, and a lack of awareness of and strategies to deal with this in course design, could lead to confusing, ineffective resource discovery experiences for learners. Some stakeholders (including learners) were of the opinion that sometimes experienced Internet users do not mind coming out and going into different databases if they are already familiar with them. Such people may feel hemmed in by a completely seamless environment; one Workshop participant said that the VLE 'shell' could become a cage. As the population coming into universities becomes more and more IT literate, this issue may need more attention.

5.1.2 All library functions online

This includes: a reference and enquiry service; reserves, document delivery and interlibrary loans; user records; paying fines and subscriptions; access to all of the online resources, catalogues and databases available through the library; web guides and access to resources tailored for the particular course or module; online versions of required readings, such as those offered by the HERON Service;⁴³ and information skills and literacy training, such as that offered by the RDN Virtual Training Suite.⁴⁴

Concerns about this include the potential diminishment of two important educational functions of traditional libraries: serendipitous browsing (finding the book you need right next to the one you were actually searching for); and their social function as a place to meet fellow students and discuss sources of information, etc.

The latter may be catered for by the VLE's online communication and resource sharing tools, but teachers must take care to encourage and enhance the use of these. The Edge Hill experience showed that some face-to-face sessions throughout even a distance course are invaluable in introducing students to each other and to staff, and ultimately to encouraging ongoing collaborative participation.⁴⁵

The former touches on the spoon-feeding question; serendipitous browsing can happen within a library catalogue and on the Internet, but learners may need to be encouraged to use these, as opposed to just reading the required texts, and may need to learn to evaluate the quality of what they find on the Internet.

There is another concern that touches on the human contact element of online learning: contact with library staff. This was raised by learners, rather than librarians. Libraries offering services to their distance learners in institutions world-wide are developing ways to give their users the same kind of personal, efficient and 'on time' service as they offer face-to-face. Initiatives such as Leicester University's pilot reference chat service⁴⁶ are making steps towards this, and in the U.S. the University of Tennessee has developed various ways of ensuring distance services.⁴⁷

5.1.3 Individualisation for the learner

Includes such ideas as: the student portal, which could cross institutions and be available throughout a learner's life; the Amazon idea of tailoring resources and notifying the user about relevant resources; the ability to save and share searches; the ability to take and embed notes with information resources, and to share resources; and settings for "level" such as undergraduate, third-year etc., with options to adjust upwards if the user wishes.

⁴² See JISC/RSLP funded project HILT (High Level Thesaurus) for a full analysis of this issue, at: <http://hilt.cdli.strath.ac.uk/>

⁴³ HERON (Higher Education Resources ON-demand), at: <http://www.heron.ac.uk/>

⁴⁴ RDN Virtual Training Suite at: <http://www.vts.rdn.ac.uk/>

⁴⁵ See: Sarah Currier. *INSPIRAL Case Study 4: Edge Hill College of Higher Education: Post-Graduate Certificate in Teaching & Learning in Clinical Practice (Introductory Module)* at: <http://inspiral.cdli.strath.ac.uk/documents/casestudies.html>, and section 4.4.

⁴⁶ See: McGill, L. *Global chat: web based enquiries at the University of Leicester*. Paper from: Libraries without Walls 4: The Delivery of Library Services to Distant Users: Distributed Resources - Distributed Learning, 14-18 September 2001, Molyvos, Greece. Publication pending by the Library Association. Accompanying PowerPoint presentation at: <http://www.cerlim.ac.uk/conf/lww4/cont.htm>. Contact: Ms Lou McGill at: lkm5@leicester.ac.uk.

⁴⁷ See: Sharron Brown and Sarah Currier. *INSPIRAL Case Study 6: University of Tennessee Libraries* at: <http://inspiral.cdli.strath.ac.uk/documents/casestudies.html>, and section 4.6.

Some stakeholders felt that, particularly with the last option, this could be taken too far. Once again, not all students want or need this much handholding, and some, particularly the technically proficient or information literate, might even find it restrictive.

5.1.4 Flexibility for the teacher

Teachers would like to be able to easily adapt or update courses, including the information resources embedded in or linked to from them, from anywhere. Flexibility in terms of being able to design the course according to their own pedagogical approach, rather than having it dictated by the system, was also seen as extremely important, and vital for bringing academics on board with e-learning. Finally, the system should have the capability to feed back data to the teacher about what information resources and services are being used.

However, some teachers may find this too time-consuming, and prefer the kind of VLE system that is an easy-to-use but difficult-to-tinker-with template. Forward planning months in advance of a course is also not always practical.

5.1.5 Universal accessibility

The Holy Grail of universal accessibility includes: accessibility for users with differing physical abilities; adaptability to differing learning styles; availability on and off-campus (an issue with regard to certain subscription library materials); equitable access for distance learners abroad (usually the biggest problems are access to hard copy resources and time zone problems with communications); equitable access for the economically disadvantaged (those with a PC or laptop of their own, versus those who have to wait in line at the Computer Centre); and usability on any platform or hardware.

The last of these in particular must be qualified by 'within reason'. The problems of distance learners abroad are being partially looked into by the British Council's pilot Distance Learning Zones project⁴⁸, which, while it is not applicable to INSPIRAL directly, is worth investigating by institutions with overseas students.

5.1.6 Ease of use

Not much can be added here except, in the word of one LT expert interviewed by INSPIRAL:

“For systems to be easy to use ‘on top’, they must be more complex underneath.”⁴⁹

And this of course means more time, money and expertise.

5.2 The Barriers

A couple of stakeholders explicitly stated the view that technical issues are not the most significant barriers to integration, making the point that, if we could solve the organisational problems which exist at every level, we could easily train our ingenuity on the technology and move forward.

The barriers that were identified throughout INSPIRAL fall into the following areas, each of which leads into the next:

- Resourcing issues
- Institutional infrastructure and politics
- Staff development issues
- Teaching and learning issues
- Content issues
- Access issues

5.2.1 Resourcing issues

There is a need for coherent vision and adequate resources from a high level, responsive to the demands and needs of the learners and the coal-face expertise of educational staff. This is a common

⁴⁸ <http://www.britishcouncil.org/infoexch/dlz/index.htm>

⁴⁹ See: Sarah Currier. *INSPIRAL Stakeholder Consultation: Stakeholder Interviews Summary Report*. On web site at: <http://inspiral.cdjr.strath.ac.uk/documents/documents.html>

problem in HE, but it is exacerbated in this area because these e-learning developments are demanding the collaboration of disparate groups, with different priorities, viewpoints, and even different e-learning 'languages' (ask a computer programmer, a librarian and a biology teacher what a 'taxonomy' is!).

- 5.2.1.1 Top level managers in universities and colleges need to understand that developments in e-learning are not cost-savers, and may require additional resources to implement effectively. However, there was wide agreement that the considerable benefits, if properly presented, should make this palatable.
- 5.2.1.2 Who in an institution is responsible for these initiatives? Once again, the overlap of interests within and between institutions (e.g. between library services, learning technologists and academics) requires strong, responsive leadership from above.
- 5.2.1.3 There was some feeling amongst the stakeholders that too many projects are funded, and not enough services, particularly amongst enterprises which should be services, incorporating long-term strategic thinking and stability of staffing and other resources. The 'death' of good projects which users had wanted to see become services was often discussed over tea breaks at INSPIRAL's events. The issue of supporting funded projects in the transition to service is a significant aspect of this.

5.2.2 Institutional infrastructure and politics

The nature of the proposed integration requires co-operation, collaboration, mutual understanding, and sharing of resources. The traditional culture within HE was seen by many to be inimical to this, constituting a serious barrier to efficacious implementation in many institutions. The same barriers exist at the level of HE and FE funding bodies, professional associations and government. This ties into the previous issue of resourcing, but some other points include:

- 5.2.2.1 Competition and territorialism.
- 5.2.2.2 Resistance to change in general.
- 5.2.2.3 Resistance to new technologies.
- 5.2.2.4 Fear of change and evolution of professional roles.
- 5.2.2.5 Inter-professional difficulties, particularly between libraries, academia and systems.
- 5.2.2.6 Incentives: a research culture where teaching skills and developments are not rewarded, and support staff such as librarians and staff developers are not accorded equal status with their academic colleagues, even when they teach.

5.2.3 Staff development issues

Staff development could be seen as both a resourcing issue and an infrastructure issue. However, it has its own specific problems. It was raised at every juncture of the study as an absolutely necessary part of the success of any new venture in education, particularly where people are feeling fearful or threatened.

- 5.2.3.1 Support and training for staff needs to be ongoing, and means more than just teaching them to use the technology. New skills and new roles must be incorporated.
- 5.2.3.2 Pedagogical issues need to be incorporated, to ensure the academic validity of teaching and using information online. These issues have a history of being ignored by librarians in particular, but for academics to accept the close library input necessary, this must change.
- 5.2.3.3 Staff development must be applied to all staff; not just those directly involved in preparing an online course.
- 5.2.3.4 The professional incentives must be there, such as accreditation.

5.2.4 Teaching and learning issues

- 5.2.4.1 Time and again, concerns over the potential for spoon-feeding students information versus overwhelming them with information overload, or letting them loose in the un-controlled world of the Web were raised. The traditional role of the librarian in teaching information literacy skills must not be lost in the rush to a complete online experience.
- 5.2.4.2 Some stakeholders said that online learning should be an enrichment tool, not a replacement for campus-based, face-to-face learning. However, as others pointed out, distance learners must be supported in equivalent ways to students in classrooms. If universities want to increase their student numbers through distance learning, avoiding needing more physical space, they have a duty to ensure that those learners are not disadvantaged.
- 5.2.4.3 The issue of differing learning styles was also raised. Edge Hill was one case study where active attempts to deal with this issue were being made.⁵⁰

5.2.5 Content issues

- 5.2.5.1 The development and availability of high-quality content was of concern to some teachers, who felt that what is presently available is off-putting to teachers, particularly with the possibility of online resources being removed or changed. As one stakeholder interviewed said:

"You don't know when someone's going to pull the plug on a resource, when you have found a good one. You could design a great course around it and then someone pulls the plug on it."⁵¹

- 5.2.5.2 There was some discussion around how much time and effort teachers should spend developing their own content, versus commercial production of content and the attendant access and quality issues. Who judges content worthy is an important question, particularly in an environment where it is very easy for anyone to post anything on a web page.
- 5.2.5.3 The sharing of content was put forward as an ideal, with its own problems.

5.2.6 Access issues

Authentication, IPR and copyright, privacy, plagiarism, and interoperability were all common concerns. These are being looked at in various JISC projects and studies.

6. Learner Needs and Priorities

6.1 The Learner Consultation

The timing of the INSPIRAL project over the 2001 summer break caused great difficulty in engaging learners in the consultation process. This unfortunate gap in the study was redressed as much as possible as detailed below. Further and ongoing learner consultation is vital for a true and continuing understanding of learner needs and issues around integration of online learning and information resources and services (See section **9. Recommendations to the JISC of priority areas for future study and strategic investment, Recommendation 6.1**).

The results of other studies into learner needs around VLEs/MLEs and digital libraries were investigated via the literature review (see **3.5 Learner Needs**) and the case studies (see particularly Case Studies 3 and 4, both of which cover the evaluation of learner responses to integrated online

⁵⁰ See: Sarah Currier. *INSPIRAL Case Study 4: Edge Hill College of Higher Education: Post-Graduate Certificate in Teaching & Learning in Clinical Practice (Introductory Module)* at: <http://inspiral.cdlr.strath.ac.uk/documents/casestudies.html>, and section **4.4**.

⁵¹ See: Sarah Currier. *INSPIRAL Stakeholder Consultation: Stakeholder Interviews Summary Report*. On web site at: <http://inspiral.cdlr.strath.ac.uk/documents/documents.html>

learning). Both of these broadly affirm the following findings. For a more detailed analysis, see the *INSPIRAL Learner Consultation Report*.⁵²

6.1.1 Learner interviews

Initially, two learners were interviewed using the *Learner Interview Plan*; one face-to-face, and one filling in the *Plan* as a questionnaire. After the stakeholder interviews and *Stakeholder Interviews Summary Report*⁵³ were completed, a third learner e-mailed in a response, once again filling in the *Plan* as a questionnaire. These three learners covered a range of experiences with online learning and information provision, and raised some pertinent issues. This enabled the planning of the Learner Focus Group.

6.1.2 Learner Focus Group

Two Learner Focus Groups were originally planned, but only one went ahead, the other having attracted no participants. Four participants signed up, but only two showed up on the day, bringing the sum total of learner participation to five. Obviously, this can in no way be seen as a representative sample. However, the five learners canvassed covered a range of online learning experiences, and their comments are brought together here to indicate the broad areas of priority found.

6.2 Learner Priorities

6.2.1 Social interaction

The campus library's role as a space for social gatherings, shared study, and sharing of information resources found by learners was mentioned only a few times in INSPIRAL's consultation with educational professionals. However, it was absolutely key to four out of the five learners consulted directly by INSPIRAL. Additionally, two of them mentioned the need for actual personal contact with librarians.

This was echoed in the findings of the Edge Hill case study (Case Study 4), where face-to-face contact between the students at introductory sessions was found to increase their ability to collaborate online, and face-to-face contact with tutors and librarians at these same sessions enabled greater ease and confidence with necessary IT and information literacy skills. Four of the five case studies in all made direct efforts to enable contact with library staff throughout online courses, via e-mail, telephone, fax, online request forms, and, in the case of Case Study 6 and Brief Exemplar 6, live chat services.

One learner respondent in the study felt that library staff with a dedicated role to support distance learning would have been helpful on his course. Of the case studies, three institutions provided service in this way (Case Studies 2, 4 and 6) while the others concentrated on preparing library staff in all areas to be able to meet the needs of distance and other online learners. At this point, neither approach has been shown to be better than the other, and possibly depends upon the structure of the particular institution and the needs of their particular learners.

In a broader sense, some respondents thought that integration of library services and resources into an online course could give a feeling of belonging to the institution. One also touched on the issue of wider institutional participation, suggesting the need for course committees or equivalent that students can take part in, make comments and have someone respond.

6.2.2 User interface

The importance of a seamless, easy to use interface was mentioned by all the learners. In terms of providing seamlessness of searching for information, two respondents didn't feel this was the highest priority. Echoing the caveats expressed in the wider consultation, both of these respondents were highlighting an issue which four of the five respondents felt was of importance; what could be termed the 'spoon-feeding vs. information overload' problem.

6.2.3 Provision of information

⁵² See: Sarah Currier. *INSPIRAL Learner Consultation Report* at <http://inspiral.cdli.strath.ac.uk/documents/Intrepv2.pdf>

⁵³ See: Sarah Currier. *INSPIRAL Stakeholder Interviews Summary Report* at <http://inspiral.cdli.strath.ac.uk/documents/documents.html>

Some educational professionals who took part in the wider consultation were uncertain whether learners would express concerns about spoon-feeding, which was often near the top of their own list of priorities. It is clear in this small study, however, that some learners are aware of the necessity for learning research skills, and for having access to a certain level of freedom to search for themselves. The role traditionally played by librarians in sifting and quality-assuring resources was also mentioned strongly as important by two of the learners.

6.2.4 User training

User training in the use of VLEs and information sources was mentioned by three respondents.

6.2.5 Equivalent services

The two distance learners involved in this study who required access to full library services believed that such access should be given. One of their institutions already attempted to do so, and the learner in question took this for granted (although he is a member of one of the first intakes to have this advantage). The other was clearly dissatisfied with the lack of equivalence of library service.

6.2.6 Personalised portals

The issue of personalised user portals was not mentioned by any of the learners until it was raised with them as an idea. They were then generally in favour of it, being familiar with such services as that provided by Amazon.

7. UK and the US: A Comparison

In the words of INSPIRAL Steering / Advisory Group member Dr. Amy Friedlander:

"The higher education enterprise in the U.S. defies simple characterization. The obvious example are the private institutions and the publicly funded institutions, and even here, there are substantial variations from state to state."⁵⁴

In brief, the e-learning situation in the U.S., and in fact world wide, is driven by similar factors to that in the UK, namely: technological developments increasing and changing the expectations of learners; changes in society resulting in changes in the nature of the student population (including globalisation of learning); and new developments and understandings of what learning is and how it can best be accomplished.

The American higher education system is not as driven by central government as it is in the UK. On top of the traditional privately run large universities, there is growing use of commercial contracting out of instructional responsibilities rather than using tenured faculty, and increasingly private firms such as Microsoft⁵⁵ are collaborating in higher education or running their own universities. These last developments are already becoming factors in the U.K. and are likely to increase in coming years, once again driven by the globalisation of the educational marketplace.

The terms "VLE" and "MLE" are not used in the U.S.; distance learning is referred to as remote learning, and the term "virtual classroom" and "Web based instruction" are examples of terms used in a broader sense than VLE. There is no generic term for a networked learning environment encompassing both campus and distance based online instruction. This is in spite of the fact that the systems or platforms we refer to as VLEs and MLEs are widely developed and used in the U.S., by both commercial firms and educational institutions themselves. The difference in language probably indicates a difference in conception or priorities, but it is beyond the scope of this project to analyse this. Distance learning and the use of technology in teaching have long histories in the U.S., and even today, the use of live television and web-based videoconferencing are more prevalent than in the U.K.

⁵⁴ E-mail to Sarah Currier, 17 May 2001.

⁵⁵ See: <http://research.microsoft.com/programs/>. The Western Governors University has 14 business partners including IBM, Sun, IT&T and Microsoft. The Jones Education Company aims to "get the cost of real estate out of education" and uses cable television to deliver 6 certificates and 11 degrees in conjunction with 14 institutions. For these and more see: Michael Thorne. *Universities of the Future*. PowerPoint Presentation at SeSDL videoconference seminar series 2000/2001, scroll down page at: <http://www.sesdl.scotcit.ac.uk:8082/seminars/index.html> for link.

In terms of digital and hybrid libraries, the diffuse characteristics and lack of centralisation of the education system has meant that there have not been the education/library based developments equivalent to the JISC's eLib hybrid libraries and DNER. Where libraries in the U.S. appear to have excelled is in developing their services to distance learners, and in linking to electronic resources; "joined up" ventures to not appear to have been a widely established priority. In fact, national digital library research and initiatives have taken part in large measure within the computer science community, particularly in such well-funded areas as the National Science Foundation⁵⁶ and the military, which is a driving force behind, for instance, the IMS metadata specification.

8. VLE, MLE and Digital Library Systems in Use in the UK: An Overview

The JISC does not recommend any particular VLE/MLE, but it does offer help in evaluating systems.⁵⁷ Likewise, the information contained in this Report or any of INSPIRAL's documentation is not intended to constitute a recommendation or condemnation of any piece of software or company. It is merely a collation of the information and the stakeholder opinions that have been made available throughout the course of the study.

The UCISA survey on the management and implementation of VLEs in UK universities and colleges found that WebCT is the most commonly used VLE, followed, in order of usage, by: Blackboard, FirstClass, Lotus LearningSpace, Lotus Domino, TopClass, Learnwise, CoMentor, COSE and ELEN.⁵⁸ VLEs developed in-house as a group came fourth, between Lotus LearningSpace and Lotus Domino. However, it appears that in the last 18 months, Blackboard has been overtaking WebCT, and both Blackboard and WebCT are now outstripping all other VLEs by a large margin.

WebCT appears to be the only VLE provider that is actively seeking ways to integrate with library management systems,⁵⁹ while Blackboard has a new initiative, Building Blocks,⁶⁰ which intends to allow for other applications to be built into the basic Blackboard architecture. The main problem with these big, commercial companies, as expressed by stakeholders during INSPIRAL, is that they are too prescriptive in terms of pedagogical approach. Some of the smaller systems, including UK-developed CoMentor and COSE, have been specifically developed to allow more flexibility for the development of courses. As is often the case with technology, the choices seem to come down to big, easy to use and well supported versus small but more finely tuned to local user needs.

In terms of library management systems, two have publicly stated their specific intention to work with online learning developments: TALIS, which has signed a partnership agreement with WebCT, and Ex-Libris's ALEPH, which is developing products to support the type of information resource integration highlighted throughout INSPIRAL.

⁵⁶ See JISC/NSF collaboration at: <http://www.jisc.ac.uk/nsf/>

⁵⁷ See: Britain and Liber (1999), and the JISC MLE Briefings and reports at: <http://www.jisc.ac.uk/mle/reps/briefings/bp0.html>.

⁵⁸ See presentation from First INSPIRAL Workshop: Martin Jenkins. *Management and Implementation of VLEs within Universities and Colleges: a UCISA Study*. <http://www.ucisa.ac.uk/SG/events-papers/mle-vle/jenkins.ppt>. Draft version of the full UCISA report should be available on the UCISA TLIG web site (<http://www.ucisa.ac.uk/>) by mid-November.

⁵⁹ WebCT have "a new partnership with TALIS in response to the growing requirement from universities and colleges for a link between their e-learning systems and the library and information resources which support these on-line teaching activities. See: <http://www.talis.com/pressrele/webct.htm>." -- Appendix 3: VLE, MLE and Digital Library Systems and Tools.

⁶⁰ "See press release at: <http://company.blackboard.com/press/viewrelease.cgi?tid=190>. Doesn't specifically mention library management software or other library functions, but does list: "Concord – content management that automates the processes of building, linking, maintaining and disseminating course content; ... HarvestRoad – content management solutions for the e-Education market, enabling the collection, management and sharing of learning materials; ... MetaText – eBooks provider with substantive customization options for faculty and students". -- Appendix 3: VLE, MLE and Digital Library Systems and Tools.

For more detailed notes on the above-mentioned systems, see **Appendix 3: VLE, MLE and Digital Library Tools and Systems**.

A detailed description and comparison of the VLEs: Ariadne, Blackboard, Distance Learning System, IBT Server, LearningSpace, Medit, ToolBook II/Librarian, TopClass, and WebCT may be found on EduTech's web page *Comparison of Web Based Course Environments*.⁶¹

9. Recommendations to the JISC of Priority Areas for Future Study and Strategic Investment

The areas where the JISC may support integration of digital libraries and VLEs, as raised by INSPIRAL's stakeholders throughout the study, came within three main areas:

- Provision of information and guidance
- Facilitating co-operation and collaboration
- Further research

Certain aspects of these issues are outwith the realm of the JISC's direct influence, being either institutional responsibilities or wider cultural problems. However, many stakeholders took the opportunity of this pre-funding consultation to suggest ways in which the JISC may be able to influence both institutions and the culture.

In several cases the JISC is already going some way towards providing for the recommendations below; these points are included because they were important to INSPIRAL's stakeholders, and may be applied specifically to the area of VLE/digital library integration.

Recommendation.1

The JISC should provide information and support to institutions in the form of national standards, guidelines and case studies in the following areas, specific to VLE / library integration:

Recommendation.1.1

Use of metadata specifications and other specifications and standards to support interoperability

- These should arise out of current work at CETIS and the JISC Interoperability Focus, as well as through the use and development of the JISC/DNER standards and guidelines.

Recommendation.1.2

Involvement of and collaboration between staff with relevant expertise

- Including library staff for information resource and service provision, learning technologists for the development of courseware, and academic and educational development staff for pedagogical requirements.

Recommendation.1.3

Staff development and training

- Including role development, changing roles and necessary skill sets in the new collaborative environment.

Recommendation.1.4

User training, support and education

- Including basic C&IT skills training, equitable access to technology, helpdesk facilities, information skills and literacy education (including evaluation of e-resources and plagiarism).

Recommendation.1.5

User and pedagogical evaluation of integrated courses and modules

Recommendation.2

⁶¹ http://www.edutech.ch/edutech/tools/comparison_e.asp

The JISC should provide price guides and real cost surveys for implementation, including cost implications of training, staff time, hardware, etc.

Recommendation.3

The JISC should provide an independent, comparative guide to specific VLE/MLE and library management systems, including information on their suitability for linkage and integration, so that institutions are not reliant on company information only.

- Including information on projects and institutions currently integrating library resources and services with VLEs/MLEs, which VLE/MLE and library management systems are they using, and the results of any evaluations.
- Building on the research done by UCISA on the management and implementation of VLEs in HE and FE.
- Building on the EduTech⁶² web site's in-depth and useful descriptions, evaluations and comparisons of most of the major VLEs.

Recommendation.4

General recommendations for the JISC regarding information provision and incorporating feedback

- Although the following two recommendations are not directly related to the integration of VLEs and digital libraries, they were very important to INSPIRAL's stakeholders, and have considerable potential impact on the efficacy of the previous recommendations:

Recommendation.4.1

The JISC should ensure that the support and information it provides is accessible, widely disseminated and easy to find. The ongoing development of the JISC web site as a well managed, user-friendly exemplar of online information provision is vital.

- The JISC should network and disseminate more widely within HE & FE to ensure that academics and other groups within education are aware of their work and its value to teaching and learning.
- To this end, the JISC should ensure that its own research activities will be viewed as valid and authoritative in the eyes of academics and educational developers.

Recommendation.4.2

The JISC should provide an accessible, formal feedback mechanism that is integral to its decision-making process, and that is available to their staff and users at all levels.

Recommendation.5

The JISC should link its learning & teaching, MLE/VLE development, and information resource strands to fund development projects in the area of integration of online learning and library resources and services. The following points should be taken into consideration:

- Encouraging high-level institutional strategic support, and collaboration between academics, librarians, learning technologists, educational developers and staff developers, should be paramount.
- Priority should be given to projects that will build on developments that are already achieving innovative practice in this area in ways that make them scaleable and/or reusable.
- Consideration should also be given to those projects that wish to more fully encompass the vision for integration outlined in this report (see below, point (f)).
- The key areas to be looked at when assessing bids for development funding are:
 - (a) Evidence of strong, cohesive institutional support for learning technology developments, educational development and staff development.
 - (b) Evidence of co-operation and collaboration between libraries, academic departments, educational and staff development support units, and C&IT support services.
 - (c) Evidence that staff development for all staff will be integral to the development of a fully-integrated MLE.
 - (d) Evidence that user support and training in both basic C&IT skills, and in information literacy, will also be integral to the project.
 - (e) Evidence that learner-focused evaluation of the pedagogical success of online learning developments will be carried out.

⁶² http://www.edutech.ch/edutech/tools/comparison_e.asp

- (f) Developments should be going some way toward achieving the vision outlined in above under section 5.1, with due consideration to the caveats and barriers expressed in sections 5.1 and 5.2, and the needs and priorities of their particular users (institution, librarians, teachers and learners, with learners being the top priority).

Recommendation.6

The JISC should build on INSPIRAL's findings by further investigation into the following areas:

Recommendation.6.1 Learner needs in terms of VLE / library integration.

Recommendation.6.2 Developments in Australia and Scandinavia.

- Australia and Scandinavia were identified during the study as places where certain similarities in their educational systems and societies might make advances there of interest to the UK. Australia in particular, as a vast country, has had to deal particularly with distance learning problems, and is generally at the forefront of educational and library technology initiatives.

Recommendation.6.3 Non-uptake of e-learning technologies by learners and teachers; reasons, problems and solutions.

- Most studies, evaluations and other research have focused on what users are doing or planning to do with regard to e-learning initiatives. The issue of those who avoid or drop online learning has not been much examined, and may yield some useful information about the drawbacks and problems.

Recommendation.6.4 Virtual research environments.

- The University of Nottingham and The University of London Library are two institutions which are currently investigating the development of a "virtual research environment".

Recommendation.7

The JISC should form and support consortia across HE and FE in order to facilitate better negotiation with commercial vendors and service providers, and to ameliorate access problems caused by commercial factors. Areas where such consortia may have influence may include:

- Influencing publishers and publishing culture in general.
- Influencing the vendors of VLE/MLE and library products to ensure that institutions and teachers can use them to implement the visions and overcome the barriers identified in the INSPIRAL study. One area which was discussed during INSPIRAL's study was the possibility of embedding links to DNER/RDN resources into the major VLE products, such as Blackboard. The desirability and feasibility of this should be further investigated.
- Sharing resources.

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Appendix 1: INSPIRAL Bibliography

By Sharron Brown and Sarah Currier, November 2001

This bibliography may also be found on the INSPIRAL web site at:
<http://inspiral.cdlr.strath.ac.uk/resources/bibliography.html>

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INSPIRAL Final Report **Appendix 2: INSPIRAL's Stakeholders**

By Sarah Currier, November 2001

This list is available on the INSPIRAL web site, browsable alphabetically or by type of organisation: <http://inspiral.cdjr.strath.ac.uk/about/stakeholders.html>

ANGEL Project

<http://www.angel.ac.uk/>

Contact: John MacColl, Project Director, University of Edinburgh

Email: john.maccoll@ed.ac.uk Tel: 0131 650 7275

ATHENS

EduServ

Queen Anne House, 11 Charlotte Street

Bath BA1 2NE

<http://www.athens.ac.uk/>

Contact: David Orrell

E-mail: David@athens.ac.uk Tel: 01225 474333

Becta (British Educational Communications and Technology Agency)

Milburn Hill Road, Science Park

Coventry CV4 7JJ

<http://www.becta.org.uk/index.cfm>

Contact: Chris Kelland

E-mail: chris_kelland@becta.org.uk Tel.: 024 7641 6994

Bradford College, Grove Library

Gt. Horton Road, Bradford BD7 1AY

<http://www.bilk.ac.uk/college/facilities/collfac/libraries/>

Contact: Ellie Clement, Subject Librarian (Science, Engineering & Construction)

E-mail: ellenc2@bilk.ac.uk Tel.: 0800 0748412

British Education Internet Resource Catalogue

Brotherton Library, University of Leeds

Leeds LS2 9JT

<http://brs.leeds.ac.uk/%7Ebeiwwww/beirc.htm>

Contact: Sam Saunders

E-mail: j.p.saunders@leeds.ac.uk Tel.: 0113 233 5525

CoMantle Project (CELT, Bangor University)

Room 207, Informatics Building

Dean Street, Bangor

Gwynedd LL57 1UT

<http://celt.bangor.ac.uk/comantle/index.html>

Contact: Sandy Britain, Research Fellow

E-mail: a.britain@bangor.ac.uk Tel: 01248 383645

Coventry University Libraries

Priory Street

Coventry CV1 5FB

<http://www.coventry.ac.uk/lib/index.htm>

Contact: Sally Patalong

E-mail: lbx063@coventry.ac.uk Tel: 024 7688 7537

De Montfort University, MLE Project

<http://www.dmu.ac.uk/>

Contact: Ian Bloor

E-mail: ipb@dmu.ac.uk Tel.: 0116 2506041

Delta Institute, National Research Centre for ICT in Education, Training and Employment (WOLF,
Learning Lab and other MLE projects)

University of Wolverhampton, Shropshire Campus

Telford TF2 9NT

<http://www.delta.wlv.ac.uk/>

Contact: John O'Donoghue, Research Project Manager

E-mail: j.odonoghue@wlv.ac.uk Tel.: 01902 323854

DNER

JISC Office, King's College London

Strand Bridge House

138 - 142, The Strand, London WC2R 1HH

<http://www.jisc.ac.uk/dner/>

Contact: Caroline Ingram, Programme Manager, Learning and Teaching

Email: caroline.ingram@kcl.ac.uk Tel.: 0207 848 2937

DocuSend

Contact: Peter Wynne

E-mail: p.wynne@mmu.ac.uk

Edge Hill College of Higher Education

St Helen's Road, Ormskirk

Lancashire L39 4QP

<http://www.edgehill.ac.uk/>

Contact: Sue Roberts, Head of Information and Media Services

E-mail: Robertss@edgehill.ac.uk Tel: 01695 584517

EduServ - home of CHEST, NISS and Athens

PO Box 2674

Bath, BA2 7XY

<http://www.eduserv.org.uk/>

Contact: David Orrell

E-mail: David@athens.ac.uk Tel: 01225 474333

EEVL: The Internet Guide to Engineering, Mathematics and Computing

Heriot-Watt University Library

Edinburgh EH14 4AS

<http://www.eevl.ac.uk/>

Contact: Roddy McLeod, EEVL Manager

E-mail: R.A.MacLeod@hw.ac.uk Tel. 0131 451 3576

ELib, Electronic Libraries Programme (Evaluation)

<http://www.ukoln.ac.uk/services/elib/>

Contact: Stephen Pinfield, University of Nottingham,

E-mail: Stephen.Pinfield@Nottingham.ac.uk Tel.: 0115 951 5109

FAILTE: Facilitating Access to Information and Learning Technology for Engineers

Institute for Computer Based Learning

Heriot Watt University

Edinburgh EH14 4AS

<http://www.failte.ac.uk/>

Contact: Phil Barker, Project Manager

E-mail: philb@icbl.hw.ac.uk Tel: 0131 451 3278

FENC (Further Education National Consortium)

<http://www.fenc.org.uk/>

Contact: Lynn Jaynes
E-mail: lynn.jaynes@fenc.org.uk

Fretwell-Downing

<http://www.fdgroupp.co.uk/>

Contact: David Kay, Strategic Development Director, Fretwell-Downing Education Ltd
E-mail: david.kay@fdgroup.com

Glasgow Caledonian University, WBLT (Web Based Teaching and Learning), Dept. of Learning and Educational Development.

70 Cowcaddens Road

Glasgow G4 0BA

<http://wblt.gcal.ac.uk/>

Contacts: Mary Cuttle (Project Manager) & Linda Creanor (Project Director)
Tel.: 0141 331 1271 E-mail: m.cuttle@gcal.ac.uk & l.creanor@gcal.ac.uk

Glasgow Colleges Group - Glasgow Telecolleges Network

Partners in Learning Centre

The Adelphi, 12 Commercial Road

Glasgow G5 0PQ

<http://www.gtn.org.uk/>

Contacts: Catherine Kearney (Chair of GCG) & Craig Green (Manager, Glasgow Telecolleges Network)

Tel.: 0141 429 1999 E-mail: Catherine.Kearney@gcbp.ac.uk & craig@gtn.org.uk

Glasgow Digital Library

Centre for Digital Library Research

Andersonian Library, University of Strathclyde

101 St James' Road, Glasgow G4 0NS

<http://gdl.cdrl.strath.ac.uk/>

Contact: Jane Barton, Librarian and Project Officer
E-mail: jane.barton@strath.ac.uk Tel.: 0141 548 2379

Heriot Watt University, Institute for Computer Based Learning

Heriot Watt University

Edinburgh EH14 4AS

<http://www.icbl.hw.ac.uk/>

Contact: Phil Barker, Learning Technology Advisor
E-mail: philb@icbl.hw.ac.uk Tel: 0131 451 3278

Heriot Watt University Library

Heriot-Watt University Library

Edinburgh EH14 4AS

<http://www.hw.ac.uk/library/index.html>

Contact: Roddy McLeod, Senior Faculty Librarian - Building Engineering & Surveying
E-mail: R.A.MacLeod@hw.ac.uk Tel. 0131 451 3576

HERON (Higher Education Resources ON demand)

The Library, Information Services

University of Stirling

Stirling FK9 4LA,

<http://www.heron.ac.uk/>

Contact: Sally Curry, Project Manager
E-mail: s.g.curry@stir.ac.uk Tel: 01786 466616

ICONEX Project

<http://www.iconex.hull.ac.uk/>

Contact: Steve Jeyes

E-mail: sjeyes@newark.ac.uk

INHALE Project

Library Services, University of Huddersfield

<http://inhale.hud.ac.uk/>

Contact: Jenny Brook, Project Co-ordinator

E-mail: j.a.brook@hud.ac.uk Tel.: 01484 473051

JAFER Project

Oxford University, Libraries Automation Service

99 Banbury Rd, Oxford, OX2 6JX

<http://www.lib.ox.ac.uk/jafer/>

Contact: Richard Mawby, Administrator

Email: Richard.Mawby@las.ox.ac.uk Tel: 01865 284454

James Cook University

Information Services

PO Box 6811 Cairns

QLD 4870 AUSTRALIA

<http://www.jcu.edu.au>

Contact: Judith Clark, Manager, Information Services

E-mail: Judith.Clark@jcu.edu.au

JCIEL Programme (JISC Committee for Integrated Environments for Learners)

<http://www.jisc.ac.uk/jciel/>

Contact: Sarah Porter, Programme Manager

E-mail: s.c.porter@bristol.ac.uk

JCIEL MLE Programme

<http://www.jisc.ac.uk/mle/>

Contact: Richard Everett, Co-ordinator

E-mail: richard.everett@bristol.ac.uk Tel.: 0117 908 2622

JTAP Programme (JISC Technology Applications Programme)- Now finished.

<http://www.jisc.ac.uk/jtap/>

Contact: Tish Roberts, JCIEL/JTAP Programme Co-ordinator

E-mail: tish.roberts@man.ac.uk Tel.: 01736850605

LIFESIGN Project

Learning Resources Centre, University of Glamorgan

<http://www.lifesign.ac.uk/>

Contact: Kate Lloyd Jones, Lifesign Project Officer

Email: klloydjo@glam.ac.uk Tel.: 01443 483563

NLN (National Learning Network)

FE ILT Committee Secretariat, Becta

Milburn Hill Road, Science Park

Coventry CV4 7JJ

<http://www.nln.ac.uk/>

Contact: Chris Kelland

E-mail: chris_kelland@becta.org.uk Tel.: 024 7641 6994

Open University VLE/MLE Projects

Walton Hall
Milton Keynes MK7 6AA
<http://www.open.ac.uk/>
Contact: Diana Shore
E-mail: D.E.Shore@open.ac.uk Tel: 01908 274066

PELICAN (Pricing Experiment Library Information Cooperative Network)
Loughborough University Dept. of Information Science
<http://www.lboro.ac.uk/departments/dis/disresearch/pelican/indexpage.html>
Contact: Rachel Hardy, Research Associate
E-mail: r.l.hardy@lboro.ac.uk Tel.: 01509 223079

PSIgate: Physical Sciences Information Gateway
Minshull House, 47-49 Chorlton Street
Manchester M1 3EU
<http://www.psigate.ac.uk/>
Contact: John Blunden-Ellis, Service Manager
E-mail: j.blunden-ellis@mmu.ac.uk Tel: 0161-247 6679

Queen's University Belfast, Computing Services
No.6 College Park East
Information Services
Queen's University Belfast
Belfast BT7 1NN
<http://www.qub.ac.uk/csv/>
Contact: Randall Thompson, Head of Learning and Teaching Division
E-mail: R.Thompson@qub.ac.uk Tel: 02890 335051

RDN Subject Portals Development Project
JISC/DNER Office
King's College London
Strand Bridge House
138 - 142 The Strand
London WC2R 1HH
<http://www.portal.ac.uk>
Contact: Simon Jennings, Project Director
E-mail: simon.jennings@kcl.ac.uk Tel: 020 7848 2537

RDN Virtual Training Suite
Institute for Learning and Research Technology (ILRT)
University of Bristol, 8-10 Berkeley Square
Bristol BS8 1HH
<http://www.vts.rdn.ac.uk/>
Contact: Emma Place, Project Manager
E-mail: emma.place@bristol.ac.uk Tel: 0117 928 7183

RESULTS Network
Centre for Academic Practice,
The Farmhouse, Gibbet Hill Campus,
University of Warwick,
Coventry CV4 7AL
<http://www.results.ac.uk/>
Contact: Dr. Jay Dempster, Project Manager
E-mail: jay.dempster@warwick.ac.uk

SCWEIMS (Student Centric Web-based Educational and Instructional Management System)

University of Edinburgh
Media and Learning Technology Service
55 George Square
Edinburgh EH8 9JU
<http://www.scweims.ac.uk>
Contact: Rob Sands
E-mail: rsands@hsy1.ssc.ed.ac.uk Tel.: 0131 650 4097

SeSDL (Scottish electronic Staff Development Library)
University of Strathclyde, Centre for Academic Practice
Graham Hills Building, 40 & 50 George Street
Glasgow
<http://www.sesdl.scotcit.ac.uk:8082/>
Contact: Lorna Campbell
E-mail: lmc@strath.ac.uk Tel.: 0141 548 3072

Southampton Institute Library, Learnwise MLE/VLE
Mountbatten Library, Southampton Institute
East Park Terrace
Southampton SO14 ORJ
Library home page:
<http://www.solent.ac.uk/library/>
Our MLE/VLE Learnwise
<http://www.learnwise.co.uk>
Contact: Alison Williams, Information Librarian - Business
E-mail alison.williams@solent.ac.uk Tel: 023 80 319 406

UHI Millennium Institute (University of the Highlands and Islands)
Caledonia House, 63 Academy Street
Inverness IV1 1BB
<http://www.uhi.ac.uk/>
Contact: Jenny Tizard, Staff Development Co-ordinator
E-mail: jenny.tizard@eo.uhi.ac.uk Tel.: 01463 279326

UKERNA (UK Education and Research Networking Association)
Atlas Centre, Chilton, Didcot
Oxfordshire OX11 0QS
<http://www.ukerna.ac.uk/ukerna.html>
Contact: Martin Hamilton
E-mail: martin@net.lut.ac.uk Tel.: 01235 822 399

University of Birmingham Information Services
<http://www.is.bham.ac.uk/menu/index.asp>
Contact: Ruth Jenkins, Liaison Librarian
E-mail: r.jenkins@bham.ac.uk

University of Edinburgh, MALTS (Media and Learning Technology Service)
55 George Square, Edinburgh EH8 9JU
<http://www.malts.ed.ac.uk/>
Contact: Rob Sands
E-mail: rsands@hsy1.ssc.ed.ac.uk Tel.: 0131 6504097

University of Edinburgh, SELLIC (Science and Engineering Library, Learning and Information Centre)
Darwin Library, The University of Edinburgh
Darwin Building, The King's Buildings, Mayfield Road
Edinburgh EH3 8JB
<http://www.sellic.ed.ac.uk/>
Contact: Wilma Alexander, SELLIC Learning Technology Officer
E-mail: wilma.alexander@ed.ac.uk Tel.: 0131 650 7409
University of Huddersfield, Learning Innovation Centre

Queensgate, Huddersfield HD1 3DH
<http://www.hud.ac.uk/lic/index.htm>
Contact: Dr Neil Ringan, Director
E-mail: n.s.ringan@hud.ac.uk Tel.: 01484 473146

University of Illinois at Urbana-Champaign
<http://www.uiuc.edu/>
Contact: Lynn Wiley, Head of the Information Resource Retrieval Center
E-mail: l-wiley@uiuc.edu

University of Leeds, Edward Boyle Library (Nathan Bodington Building, Virtual Science Park VLEs)
University of Leeds, Leeds LS2 9JT
<http://www.leeds.ac.uk/library/>
Contacts: Michael Emly, Library Systems Team Leader & Andrew Booth
E-mail: m.emly@leeds.ac.uk & A.G.Booth@leeds.ac.uk Tel.: 0113-233-5565

University of Leicester Library, Distance Learning Services
University of Leicester Library
PO Box 248, University Road
Leicester LE1 9QD
<http://www.leicester.ac.uk/li/distance/index.htm>
Contact: Lou McGill, Distance Learning Services Librarian
E-mail: lkm5@leicester.ac.uk Tel: 0116 252 5051

University of London Library, Virtual Library Service, Virtual Campus Project
Senate House, Malet Street
London, WC1E 7HU
<http://www.ucl.ac.uk/>
Contact: Sally Chambers, Electronic Library Projects Co-ordinator
E-mail: schambers@ucl.ac.uk Tel. 020 7862 8482

University of Nottingham, Student Portal
<http://www.nottingham.ac.uk/library/>
Contact: Stephen Pinfield, University of Nottingham
E-mail: Stephen.Pinfield@Nottingham.ac.uk Tel.: 0115 951 5109

University of Stirling Information Services
Stirling University Library
Stirling, FK9 4LA
<http://www.is.stir.ac.uk/>
Contact: Dr. Peter Kemp, Director
E-mail: peter.kemp@stir.ac.uk

University of Strathclyde, Centre for Academic Practice
Graham Hills Building, 40 & 50 George Street, Glasgow
<http://www.strath.ac.uk/Departments/CAP/>
Contact: Dr. Allison Littlejohn, Lecturer
E-mail: allison.littlejohn@strath.ac.uk Tel: 0141 5483072

University of Strathclyde, Centre for Digital Library Research
Andersonian Library, University of Strathclyde
101 St James' Road, Glasgow G4 0NS
<http://cdlr.strath.ac.uk/>
Contact: Dennis Nicholson, Director of Research
E-mail: d.m.nicholson@strath.ac.uk Tel: 0141 548 2102

University of Strathclyde, Digital Information Office

Centre for Digital Library Research
Andersonian Library, University of Strathclyde
101 St James' Road, Glasgow G4 0NS
<http://dio.cdli.strath.ac.uk/>
Contact: Dr. Bob Kemp, Information Officer
E-mail: robert.kemp@strath.ac.uk Tel.: 0141 548 2379

University of Strathclyde, Directorate of Information Strategy
<http://www.mis.strath.ac.uk/IS/>
Contact Derek Law, Director of Information Strategy
E-mail: d.law@strath.ac.uk Tel.: 0141 548 4584

University of Strathclyde, MLE Development Project
<http://www.strath.ac.uk/projects/millennium/mle/docs/mle-project-plan.html>
Contact: Diane McDonald, Project Manager
E-mail: D.McDonald@strath.ac.uk Tel: 0141 548 3530

University of the West of England, Bolland Library
Coldharbour Lane, Bristol BS16 1QY
<http://www.uwe.ac.uk/library/>
Contact: Jacqueline Chelin, IT Development Librarian
Email: Jacqueline.Chelin@uwe.ac.uk Tel: 0117 344 3768

University of Western Australia
<http://www.uwa.edu.au/>
Contact: T. Alex Reid, Executive Officer, Department of Computer Science and Software Engineering
E-mail: alex.reid@uwa.edu.au

Waikato Polytechnic, Online Learning (FE; New Zealand)
<http://202.14.32.200/>
Contact: John Clayton
E-mail: esjfc@twp.ac.nz

WebCT
http://www.webct.com/uk_ireland/
Contact: Colleen Malloy, Regional Sales Manager-International Division
E-mail: colleen.malloy@webct.com Tel: ++1-781-309-1129

Xgrain Project
<http://edina.ed.ac.uk/projects/joinup/xgrain/>
Contact: Sandy Shaw, Project Manager
E-mail: sshaw@ed.ac.uk

xrefer
Macmillan House, Paddington Station
London W2 1FT
<http://www.xrefer.com/>
Contact: Ms. Daryl Rayner
E-mail: daryl.rayner@xrefer.com

ZBLSA Project
<http://edina.ed.ac.uk/projects/joinup/zblsa/>
Contact: Margarete Tubby, Content Development Manager, EDINA Bibliographic Services
E-mail: m.tubby@ed.ac.uk

Zetoc Enhancements
<http://zetoc.mimas.ac.uk/>
Contact: Stephen Andrews
E-mail: Stephen.Andrews@bl.uk

INSPIRAL Final Report

Appendix 3: VLE, MLE and Digital Library Tools and Systems

By Sarah Currier, November 2001

Links to the VLE and MLE tools listed here are available on the INSPIRAL web site at: <http://inspiral.cdlr.strath.ac.uk/resources/toolssystems.html>. The following list is not comprehensive; it merely draws together information gathered along the way in the INSPIRAL study. None of the notes are to be taken as recommendations or condemnations of any given system. The JISC does not recommend any particular VLE/MLE. For further help with evaluating VLE/MLE systems see: *A framework for pedagogical evaluation of virtual learning environments* by Sandy Britain and Oleg Lieber, at: <http://www.jisc.ac.uk/jtap/hm/jtap-041.html>, the JISC MLE Briefings and reports at: <http://www.jisc.ac.uk/mle/reps/briefings/bp0.html>, and EduTech web page *Comparison of Web Based Course Environments* at: http://www.edutech.ch/edutech/tools/comparison_e.asp.

E-learning Systems, Tools and Software

Blackboard

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

Blackboard Inc. UK & Ireland information available: <http://global.blackboard.com/uk/>. New Building Blocks Initiative enabling institutions to tie in a range of other applications to the architecture of Blackboard. See press release at: <http://company.blackboard.com/press/viewrelease.cgi?tid=190>. Doesn't specifically mention library management software or other library functions, but does list: "Concord – content management that automates the processes of building, linking, maintaining and disseminating course content; ... HarvestRoad – content management solutions for the e-Education market, enabling the collection, management and sharing of learning materials; ... MetaText – eBooks provider with substantive customization options for faculty and students". This system and WebCT seen as too inflexible by some stakeholders interviewed.

Bodington Common

<http://bodington.org/index.html>

Based on the Nathan Bodington Building VLE developed at the University of Leeds:

<http://www.fldu.leeds.ac.uk/bodingtoncommon.html>

There has been a pilot project integrating hybrid libraries with several modules taught on the Nathan Bodington Building. See INSPIRAL Case Study 3 at:

<http://inspiral.cdlr.strath.ac.uk/documents/casestudies.html>

CASTLE

<http://www.le.ac.uk/castle/>

Developed at University of Leicester; freely available to HE institutions; enables integration of multiple choice questions in on-line assessment only.

Centra Symposium

<http://www.centra.com/products/symposium/index.asp>

Available from Centra at: <http://www.centra.com/>

ClassCampus

http://www.classcampus.com/ns_main/

Available from LJ Technical Systems.

Colloquia

<http://www.colloquia.net/>

Formerly known as Learning Landscapes. Developed by the TOOMOL Project (<http://toomol.bangor.ac.uk/>) at CELT at the University of Wales, Bangor. Includes: allowing for learning and other online resources to be referenced and accessed; a built in web browser.

CoMentor

<http://comentor.hud.ac.uk/>

Developed at the University of Huddersfield. Particularly aimed at arts, humanities and social science courses, where learning centres on discussion and textual resources. Based on Laurillard's conversational model; seen as more flexible than systems like WebCT and Blackboard by one experienced interviewee.

COSE (Creation of Study Environments)

<http://www.camsp.com/COSE/>

Developed by Staffordshire University.

eCollege

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

US developed. Offers free trial.

ESRI Virtual Campus

<http://campus.esri.com/>

Available from GIS.com: <http://www.gis.com/>. Used by Aberdeen's Robert Gordon University for their Virtual Campus, which integrates library resources and services via its Virtual Campus Library. See RGU's Virtual Campus at: <http://campus.rgu.com/> and the Virtual Campus Library at: <http://campus.rgu.com/campus/library/index.cfm?CFID=6034&CFTOKEN=47470556>. See also INSPIRAL Case Study 1 at: <http://inspiral.cdlr.strath.ac.uk/documents/casestudies.html>. NB: the Library's OPAC has a link from within the Virtual Campus Library, but at this stage must be logged into separately.

FirstClass

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

Available from Centrinity Inc. Offers communications / collaborative groupware platform. Not strictly a VLE, but widely used.

LE (Learning Environment)

<http://www.fdlearning.com/fdlearning/html/applications/e-learning.htm>

Available from FD Learning (previously Fretwell-Downing Education):

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

LearnOnline

http://education.learnonline.org.uk/index_1.html

UK developed VLE/MLE. Offers free six-week trial.

Learnwise

<http://www.learnwise.net/>

Available from UK-based Granada Learning Group at:

http://www.learnwise.net/profile/granada_learning_group.jhtml. Based on WOLF, developed at University of Wolverhampton. Currently can provide links, including to library catalogue, but not integration.

Lotus Domino

<http://www.lotus.com/home.nsf/welcome/domino>

Available from IBM (<http://www.ibm.com/>); not strictly a VLE but a server platform; supports communications and e-collaboration for business. Is used in UK HE and FE. (See UCISA study).

Lotus LearningSpace

<http://www.lotus.com/home.nsf/welcome/learnspace>

Available from IBM (<http://www.ibm.com/>). Developed for business but was fourth most widely used commercial e-learning package used by universities in colleges in the UK according to the UCISA study.

Merlin

<http://www.hull.ac.uk/merlin/>

Developed at the University of Hull. Includes a Resource Centre component within which an unlimited range of learning material and resources can be made available on an open access basis. Click on 'What is Merlin', then on 'Resource Centre' to see an example.

Pioneer

<http://www.ltscotland.com/services/pioneer.asp>

Free VLE, previously known as SCETPioneer, available from Learning and Teaching Scotland (<http://www.ltscotland.com/>). Has been used across educational spectrum.

Reflex

<http://www.studentsguild.com/reflex.html>

Available from Studentsguild, Norway.

TopClass

<http://www.wbtsystems.com/products/products.html>

Available from US-based WBT Systems.

Virtual Campus

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

Available from UK-based Teknical Ltd. Used by Harlow College for their HOLLI and COLLI learning environments. Provides URL referencing. See INSPIRAL Case Study 5 at:

<http://inspiral.cdrl.strath.ac.uk/documents/casestudies.html>

Virtual Science Park

<http://www.vsp.co.uk/>

In-house VLE developed at Leeds University. Provides a set of web-based collaborative tools including a sophisticated document management system. Enables: web-based access to the resources of the Leeds University Library; e-learning support for graduate, professional or executive education and training; on-line support for collaboration with individuals and groups within the University.

Virtual-U

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

Based in Canada. Available from Virtual Learning Environments Inc. (VLEI). Originally developed at Simon Fraser University in association with the TeleLearning Network of Centre of Excellence.

WebCT

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

WebCT Inc. UK & Ireland Information available at: http://www.webct.com/uk_ireland/. Campus Ed. presently enables link to library OPAC without separate log-in. Have a new partnership with TALIS in response to the growing requirement from universities and colleges for a link between their e-learning systems and the library and information resources which support these on-line teaching activities. See: <http://www.talis.com/pressrele/webct.htm>. The University of Ulster will be a pilot site using this integration. See press release under 'WebCT announces agreement with the University of Ulster' at: http://www.webct.com/uk_ireland/. States that The University's MLE development hopes to "achieve personalized, seamless access to a range of library hosted resources and educational support tools". WebCT also used by Edge Hill College of Higher Education, which integrated library services and resources; see INSPIRAL Case Study 4 T: <http://inspiral.cdrl.strath.ac.uk/documents/casestudies.html>. This system and Blackboard seen as too inflexible by some stakeholders interviewed.

Library Management Systems, Tools and Software

ALEPH

<http://www.aleph.co.il/products1.html>

Available from Ex Libris. Mentioned by one stakeholder at interview stage; said had purchased because "it's a fairly new system so doesn't carry any baggage and is easy to implement. The company has a strategy to expand its product range; products include MetaLib and XFS, which are designed to link between different datasources. Metalib is doing a hybrid library type function. Anyone can implement them." Its web site states: "MetaLib is an information portal that provides libraries, institutions and consortia with a standardized user interface for managing today's hybrid information systems. MetaLib permits the organization, dissemination, and retrieval of scholarly information in a heterogeneous environment of library catalogs and electronic databases. SFX permits context-sensitive linking among all parts of an electronic collection, including full-text repositories; abstracting, indexing, and citation databases; on-line library catalogs; and citations appearing in research articles and other Web resources."

GeoWeb

<http://geoweb.geac.com/catalog.html>

Available from Geac (<http://geoweb.geac.com/>). Used at Edge Hill College of Higher Education. See above under WebCT, and INSPIRAL Case Study 4 at:

<http://inspiral.cdlr.strath.ac.uk/documents/casestudies.html>

INNOPAC

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

Available from Innovative Interfaces Inc. Used at the University of London Library and the University of Leeds Library (see above under Bodington Common and Virtual Science Park). See INSPIRAL Case Studies 2 & 3 at: <http://inspiral.cdlr.strath.ac.uk/documents/casestudies.html>

McDonnell Douglas URICA

Used at Robert Gordon University, with a link from its Virtual Campus. See above under ESRI Virtual Campus, and INSPIRAL Case Study 1 at: <http://inspiral.cdlr.strath.ac.uk/documents/casestudies.html>.

ROADS

<http://www.roads.lut.ac.uk/>

Software developed in the UK, as part of eLib, for managing web information. Used by Leeds University Library. See INSPIRAL Case Study 3 at:

<http://inspiral.cdlr.strath.ac.uk/documents/casestudies.html>

TALIS

<http://www.talis.com/default.htm>

A leading UK-based library management system provider. See above under WebCT for their partnership with that company, intended to enhance integration between online learning and libraries.

Content Providers

Pearson Education

<http://www.booksites.net/>

Providers of online course content, written by academics who are often authors of textbooks. Developing range of European content (<http://www.pearsoneduc.com/>). Includes assignments with annotated web links. Have partnership with CourseCompass, eCollege, WebCT and Blackboard.

Xrefer

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

UK-based online reference tool. Participated in INSPIRAL's study, so can be safely assumed to be interested in integration issues.

INSPIRAL Final Report

Appendix 4: Executive Summary

By Sarah Currier, November 2001.

The INSPIRAL (INveStigating Portals for Information Resources And Learning) study, based at the University of Strathclyde's Centre for Digital Library Research and Centre for Educational Systems, was funded by JISC as a result of the request for proposals entitled: *Linking Virtual Learning Environments and Digital Libraries: A Critical Analysis of the Issues*. The aim of the project was to investigate and critically analyse, from the HE learner's perspective, the non-technical, organisational and end-user issues relating to the linkage of digital libraries with virtual and managed learning environments. The project took a qualitative approach, identifying and consulting key stakeholders, carrying out a literature review and six case studies, and disseminating results throughout in order to stimulate discussion and feedback.

The study yielded a vision for linkage of libraries and online learning, drawn from the input of learners, librarians, learning technologists, academics, and commercial interests. The educational community sees a future where the resulting online learning environments will encompass: Seamless, one-stop access; All library functions online; Individualisation for the student; Flexibility for the teacher; Universal accessibility; and Ease of use for teacher and learner.

Potential barriers were also identified, falling within the following main areas: Resourcing; Institutional infrastructure and politics; Staff development; Teaching and learning; Content; and Access. Those institutions achieving success in linking libraries and e-learning shared two things: vision backed by resources from the highest level, responsive to the needs of the learners, teachers and wider community; and strong support for professional collaboration on these initiatives between librarians, academics and learning technologists.

INSPIRAL's key deliverable, the *INSPIRAL Final Report* includes: An overview of the strategic aims of JISC in relation to INSPIRAL; A list of stakeholders, with characteristics of each stakeholder group relevant to INSPIRAL; An analysis of the needs of the learner; Six learner based case studies illustrating the findings of the analysis, and highlighting best practice; A summary of critical / key issues, detailing related problems and potential solutions; A prioritisation of these issues from the point of view of the UK HE learner; A short comparison between UK and overseas VLE / MLE and digital library development; Recommendations of priority areas for future JISC study and strategic investment; A bibliography; A list of key contacts; A list of VLE, MLE and digital library tools and systems mentioned in the project. Many of these are also available as separate documents on the INSPIRAL web site.

INSPIRAL's ultimate aim was to make recommendations to the JISC regarding future funding strategy. Seven detailed recommendations appear in the *INSPIRAL Final Report*. In short, they recommend that the JISC provides standards, guidelines and information to the HE community covering the main issues identified by INSPIRAL; funds development projects for scaleable and reusable initiatives with regard to the findings of INSPIRAL; forms and supports consortia to influence commercial interests and share resources; and builds on INSPIRAL findings with further study in certain areas, including virtual research environments.