Link^{ER}

Linking Digital Libraries and Virtual Learning Environments:

Evaluation and Review

Review of recent developments, achievements and trends in the DiVLE area

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Link^{ER}

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Preface

The Link^{ER} Project is funded under JISC's 07/02 Programme to provide programme-level formative evaluation. The Programme itself is designed to build on JISC's and institutions' previous work on digital libraries and virtual learning environments, in the context of the Information Environment, and specifically to

- explore the issues of linking VLEs with local institutional digital library resources and services;
- implement curriculum focussed pilots, based upon units of learning, linking VLEs to digital library systems;
- provide models and guidelines for other institutions about the cultural and organisational issues related to joining up these systems in an institution.

The focus of Link^{ER} is on formative studies across the other projects, collating and synthesising the outputs from the projects and producing generic lessons, issues and case examples. More specifically, Link^{ER} will

- review current developments and practice in the wider community;

- collect and synthesise data about technical, pedagogical and cultural/organisational issues from the other projects;

- produce reports which summarise the approaches taken and the lessons learned;

- develop models and guidelines for other institutions about the cultural and organisational issues related to joining up these systems in an institution.

The objective of the Workpackage from which this deliverable is derived is to determine the current state of the art in Higher Education Institutions within the United Kingdom and elsewhere regarding the linkages between digital libraries and VLEs. It does not report on either digital library or VLE activity where there is no explicit link between the two.

The report is in two parts: -

Section 1 is a review of published literature, from books, journals and the Internet, which identifies practice and experience in the UK and elsewhere. The focus has been very sharply upon the integration of digital libraries and VLEs. Literature searches have been carried out covering the library and education literature, and Internet searches have helped to identify other conference and project work.

Section 2 is a survey of Higher Education Institutions in the UK, which sought information about their involvement in any current development work at their institution involving the integration of digital library resources and services into VLEs.

Section 1. Review of published literature

1.1 Introduction

Much has been written in recent years about the impact of the online learning environment upon the academic library and the provision of information resources to students. In a wide-ranging article in 1998 for example, Wilson[1] suggested using business process re-engineering methods as an approach to "thinking about the future of academic libraries in the digital age" and touched upon the changing role of the librarian in networked user support. Rowland and Rubbert[2] later examined in depth the information needs and practices of part-time and distance-learning students in higher education and questioned whether academic libraries were rising to the challenge of providing for such students. They also suggested that the Internet, where students "get lost in the mass of information" lacks "the librarian to guide them to the exit" and is therefore not a satisfactory substitute information resource. Many other writers have addressed these and similar issues.

Not only was it the library that was being "re-engineered". Brown[3], for example, describes the development of an e-campus at a distributed university, created through the mergers of 10 existing FE and HE institutions covering a 100-mile area. The pressures on academics and librarians to change the way learning, and the information resources to support learning, were delivered became institutional imperatives. The idea that these two key groups should come together to deliver learning and learning resources in a new way is articulated in the reports of the HyLiFe and later the Inspiral projects. Wynne *et al.*[4] for example, produced ten "steps to success" or key imperatives for the implementation of a hybrid library, one of which states that "the boundaries between the hybrid library and the VLE have become blurred and it is no longer possible to consider them in separate contexts".

[1] Wilson T.D. (1998) Redesigning the university library in the digital age. *Journal of Documentation* 54 (1) January 1998 pp 15-27. London: Aslib

[2] Rowland F. and Rubbert I. (2001) An evaluation of the information needs and practices of part-time and distance learning students in the context of educational and social change through lifelong learning *Journal of Documentation* 57 (6) pp 741-762. London: Aslib

[3] Brown S (2002) Re-engineering the University. *Open Learning* 17(3) pp231-243 London: Carfax Publishing Company

[4] Wynne, P *et al.* (2001) HyLiFe: Ten steps to success. *Ariadne* 27 March 2001 http://www.ariadne.ac.uk/issue27/hylife/

This review, however, is very sharply focused upon discovering who is writing what about the integration of digital library materials into virtual learning environments to support student learning. In recent years there have been many initiatives across the world to develop digital libraries at local, national and international level, and much has been written about these ventures. At the same time, the education community has produced a body of literature on the learning process within virtual learning environments, and students' and tutors' responses to this new way of delivering teaching and learning. However, what was sought for this review was something deeper than the provision of simple "macro level" links from a VLE to a digital library, or the embedding of a pointer to "subject resources" on a library web page, or the tutor including a hypertext link to a website; it was hoped that examples of specific initiatives in which library and teaching staff had worked together to integrate specific digital library resources into virtual learning environments at micro level would emerge. The resulting body of writing has not yet proved extensive but some examples, often the outcome of project reports which have been adapted for academic journals, or from conference proceedings are given below.

To provide further context to this work, key Government initiatives are introduced, with responses from the library community. It is worth noting that, in much of the writing on this topic, the assumption is made that e-learners (the students using VLEs) will be working at a distance and that developments in VLE and digital library inter-working are mainly concerned with ensuring benefits to distance learners. However, the growth of what is coming to be called "blended learning", using appropriate mixtures of on-campus and distance learning or face-to-face and virtual learning, complicates the picture. It is not clear, for example, that optimizing library/VLE linkages for the benefit of distance students will necessarily optimize the benefits for on-campus learners, or even that these two categories are stable and well-defined.

"There is a whole new language accompanying e-learning with which information professionals need to become familiar" Mare A and Poulter S (2002)[5]

An immediate problem encountered when searching for published literature was differing terminology. The "digital library", it quickly became clear, is known both here and in other countries and contexts as the "electronic library", the "virtual library", the "distance library" or the "online library"; the VLE as a "learning management system", a "course management system" (a subtle difference in emphasis!), a "managed learning environment" (MLE), an "online learning system" or "learning environment", "instructional management system", "courseware", "learnware", and probably various other names as yet undiscovered. This made the search of online databases and the Internet rather more complex than anticipated. However the annotated bibliography below gives a picture of how digital library resources and services are being integrated into online learning environments, particularly within the UK, and some examples of similar activity in other countries.

1.2   The United Kingdom

1.2.1 Background - Government funded initiatives, and responses from the library community

When HEFCE announced it's e-university project in its circular letter 04/00[6] its stated aim was "To establish a globally-competitive provider of higher education through virtual distance learning."   The initiative was a response to the developing e-learning market in the United States and elsewhere, and to a fear that this might reduce the number of overseas students studying at UK universities and colleges. Circular 04/00 puts forward a vision of how such an e-university might be structured and formed, and particularly mentioned the contribution that JISC was making to the provision of web-based access to teaching and research resources.

HEFCE reports 00/43[7] and 00/44[8] then provided a business model for this e-university. The latter report, commissioned from PricewaterhouseCoopers, acknowledges in section B4 Learner Support, items 86 – 90, that "support material,

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[5] Mare A and Poulter S (2002) The integration of information services into an on-line environment. Vala 2002 Conference http://www.vala.org.au/vala2002/2002pdf/08MarPou.pdf
[6] http://www.hefce.ac.uk/pubs/Circlets/2000/cl04_00.htm
[7] http://www.hefce.ac.uk/Pubs/hefce/2000/00_43.htm
[8] http://www.hefce.ac.uk/Pubs/hefce/2000/00_44.htm

such as is traditionally supplied through libraries" will be needed. The report suggests that distance-learning students are provided with access to digital library materials through commercial on-line library services such as Questia or XanEdu, and briefly mentions that the latter will "offer digitally based CoursePacks to instructors to provide them with access to articles from journals, periodicals and newspapers which would allow them to package material for their students". Although this is only a very small section in a very large report, it does acknowledge that the digital library will have a role to play in an e-learning project of this magnitude.

SCONUL was quick to respond to this new initiative, and has produced a series of papers and reports. The first, a direct response to HEFCE 00/43, is a succinct discussion from a library point of view of issues arising from the provision of digital library materials for e-learning environments as envisaged in the HEFCE report[9]. The issues raised are:

- intellectual property rights

- what information resources e-University students will need access to

- what organizational form the e-University library should take and whether it should be centralized or devolved

- what support services might be needed and whether support should become part of the e-University's brand image

- what charging arrangements might be required

- whether the e-University should own its own library or contract out some library functions elsewhere

- whether the e-University should negotiate access rights to UK university libraries on behalf of its students.

Within these discussion points are issues currently being explored by the DiVLE programme, such as the production of course-packs, obtaining of electronic copyright permission, easier subject searching, and the embedding of information skills into an online environment.

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[9] Response to HEFCE's consultation (00/43) on the e-University project
http://www.sconul.ac.uk/euni_response.htm

One individual's response to the HEFCE initiative appears in the following article.

Johnston P (2001) After the big bang: forces of change and e-Learning.
Ariadne **27** http://www.ariadne.ac.uk/issue27/johnston/intro.html

This is a high level overview of "what recent developments in the area of 'e-learning' might mean for the custodians of the information resources required to support teaching and learning", and how the work of information managers might need to be transformed. It is largely a discussion of e-libraries within e-universities, and refers to the lack of explanation in the above HEFCE report as to how the e-learner will access a wide range of information resources.

Johnston also includes a most interesting section entitled "Models of learning and resource requirements" which suggests that problem-oriented learning lends itself particularly well to the use of digitised "course-packs" in which all the reference resources required for a particular teaching module, including digital library materials, are collected together and presented to the student. Johnston raises a number of issues which need to be addressed if the problem-oriented model is to be adopted, particularly the possible difficulties in obtaining permission from the copyright holder to digitise existing paper materials, the separateness of teaching and library communities, and a fear that providing integrated materials in this way might lead to a reluctance on the part of the student to "think beyond" or "read around" these core materials.

In a further section on "The challenge of integration" Johnston emphasizes that integrated access to learning materials and the information resources which support them, cannot be achieved without new collaborations and levels of co-operation between information managers, teachers and VLE suppliers.

Johnston concludes by reminding the reader that while e-learning is undoubtedly here, for the library and information world at present and in the foreseeable future, success may depend upon "a dual approach of enhancing the scope and quality of the digital proportion of that information resource while also promoting the existence of, and providing effective access to, the valuable 'non-e' component". In essence this is a description of the hybrid library model which was developed in phase 3 of eLib.

1.2.2 Some examples of the integration of library resources into the virtual learning environment

As has been mentioned, some examples of project work were found during the background research in Link^{ER} and these are outlined below. The survey described in Section 2 suggests that further publications are imminent, so this modest collection of articles might soon become rather larger!

Emly, M. and Ryan, C. (2001) Adding value to student learning: integrating the hybrid library into the virtual learning environment *The New Review of Information Networking 2001, pp225-235*. Cambridge, UK: Taylor Graham.

This article reports upon a twelve-month project at Leeds University Library, which explored the integration of library and information resources into the undergraduate learning environment. It explains how academic and library staff co-operated to produce a tailored environment containing core materials such as reading lists, a gateway to the OPAC and relevant online databases and websites, for each of five online modules. The selected subject areas covered Medicine, Geography, Philosophy and Business. The authors describe the Leeds approach as "holistic" and "user centered" with "information provision being fully integrated into the wider structures which support learning", and envisage that "access to relevant resources would be firmly located within the normal working environment" (i.e. the virtual learning environment) of each user, rather than configured as an external and optional service which the student "visits" as required.

The article describes how this aim was achieved, reports upon project evaluation and user testing, and discusses scalability.

Two short reports available on the Internet, and produced by library staff, show Leeds University's continuing commitment to the integration of library services into its VLE. The reports are:

Paper for USTLG Meeting, 26th Feb 2000
http://www.leeds.ac.uk/library/ustlg/spring01/claire.claire.pdf
Paper for USTLG Meeting, 28 February 2001
http://www.leeds.ac.uk/library/ustlg/spring01/claire/report.htm

MacColl J (2001) Virtuous learning environments: the library and the VLE. *Program 35 (3) July 2001 pp 227-239.* **London: Aslib**

This is an interesting and in depth analysis of what the relationship between the library and the VLE might or should be, and how the two might be integrated. The author covers briefly the development of VLE systems by commercial vendors and UK Universities, and describes the ANGEL project in some detail.

He raises a concern that in the move towards the online environment, where teacher and learner become "jointly responsible for the resources of a course", the traditional resource manager, namely the library, is in danger of becoming sidelined. MacColl goes on to suggest that even when library involvement is acknowledged as important, the level of such involvement is often quite superficial. He then presents with clarity the reasons why he believes librarians should be deeply involved in the development of courses in the virtual learning environment. These include that:

- tutors may unwittingly violate copyright in the online environment unless they draw upon the expertise of librarians to facilitate clearance

- one prime value of a digital resource – that it can be shared – is lost if the resource is locked within the VLE. MacColl argues that the resource should be added to the library's e-reserve system, with a link back to the VLE

- tutors may not have the skills needed to maintain links to resources, whereas librarians do

MacColl understands why tutors might be reluctant to collaborate with librarians, because of a "perception that to involve the library will introduce delay and bureaucracy", and makes positive suggestions as to how this reluctance might be overcome. He calls for librarians to "seek to ensure that they remain part of the process as virtual learning takes hold", and says that this will only be achieved through liaison and collaboration.

Roberts S and Davey J (2002) VLEs and Information Services: redefining distance learning and the role of Information Services within the Virtual Learning Environment. *In Brophy, P. Fisher, S. and Clarke, Z. eds Libraries without Walls 4: the delivery of library services to distant users. Proceedings of an international conference held on 14-18 September 2001, Molyvos, Greece. pp73-84.* **London: Facet Publishing.**

This conference proceedings paper explores the role of central learning support services in supporting distance learning through VLEs and in particular through the integration of the hybrid library. It arises from first hand experience of developing

tailored information resources both at "module" level and embedded within the actual content of a teaching module for medical and dental practitioners studying at Edge Hill College, Liverpool who were learning at a distance.

The team who developed the VLE module was not only interdisciplinary, with "expertise in education, health, teaching and learning, online learning and design, and electronic information services", but was cross-institution, with members from three institutions in the Merseyside and Cheshire areas.

The paper describes how the module was developed, used, evaluated and enhanced, and highlights strategic issues. The author repeatedly stresses the importance of cross-disciplinary collaboration.

1.2.3 The integration of information skills training into the virtual learning environment.

The need for students to develop information skills was acknowledged with particular clarity by SCONUL when in 1999 it published **"Information skills in higher education: a SCONUL position paper"**[10]. This paper explains the difference between information technology skills (those skills needed to use IT with competence) and information skills, (those skills needed to create knowledge) and why the latter are important for today's students. It also defines "seven headline skills" with examples of "the kinds of specific activity or competence which illustrate the application of the skill."

The **"Big Blue"** project website[11] provides an excellent in depth study of the state of the art of information skills training for students in post-16 education in the UK and also in the US, Australia and Europe, including a comprehensive literature review[12].

The project findings emphasize the key role played by librarians in delivering information skills training, but notes that "this role will not automatically be recognised by all other parties in the academic community and that librarians will have to fight for their rights as partners in this process".

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[10] http://www.sconul.ac.uk/publications/99104Rev1.doc
[11] http://www.leeds.ac.uk/bigblue/
[12] http://www.leeds.ac.uk/bigblue/bigbluedocs.html

University librarians have been active in the delivery of information skills for some years, but often in a context separate from the delivery of the students' other learning. Many UK university libraries have produced generic information skills training packages which they deliver to students either face-to-face, or online. The challenge by **Big Blue** for librarians to move into partnership with teaching staff has begun to be answered. The articles below, for example, demonstrate how generic skills may need to be tailored to become "discipline orientated" and integrated into the VLE by the tutor at an appropriate point, and how this is being done by collaboration between academics and the library community.

Dozier M and Brown F (2002) Web-based information skills tutorials for evidence based learning and practice. *In Proceedings of the 8th European Conference of Medical and Health Libraries.*

http://www.zbmed.de/eahil2002/proceedings/dozier-proc.pdf

This article describes how information skills training for medical and veterinary students at Edinburgh University is delivered and managed in an online environment, EEMeC (Edinburgh Electronic Medical Curriculum). An online training programme, which gradually increases in complexity, is presented to medical students over a four-year period, and the students' skills and competencies are formally examined in the third year. The training programme has also been adapted for veterinary students. The Information Skills team has taken advantage of facilities offered by the VLE, such as the creation of online tutorials and the use of quizzes, so that students may check their understanding.   As well as being trained in the online environment, students are made aware that one-to-one help is always available from an information professional.

The article provides illustrative screen prints, tables showing an outline of the tutorials and expected learning outcomes and skills. There is also a short section giving student feedback.

Moore, K. and Abson, C (2002) Really useful or virtually useless? *Cilip Update* 1(8) pp 34-36 London: CILIP

This is a report from two Information Specialists in the Learning Centre at Sheffield Hallam University which tells how the delivery of skills training at the University has moved from the model in which reluctant students attend an "information skills

workshop", to the integration of skills training into the students' virtual learning environment, in this case Blackboard.

InfoQuest is a five-module skills training package which provides students with "a structured route through information skills development" but with a clear focus upon the "learning resource environment", achieved by linking training exercises to the student's project or assignment work. This close coupling with the student's work environment is a key concept for the team, who quickly rejected the provision of a generic skills module. "From the outset" they say, "our vision was to create a resource that could stand in place of face-to-face skills sessions when necessary. For us this ruled out the option of the generic route. None of the development team would have considered standing up in front of a class of radiographers without addressing their specific needs for health information … we would have cheated the students."

The report describes the alliances which were necessary to develop InfoQuest – not only learning centre information specialists and school-based academics, but multimedia developers and IT specialists too. This integrated approach was well received by students. Feedback showed that they liked the flexibility of being able to use InfoQuest when and where they needed it and of being able to return to it. Mature students with low level IT skills "found it a safe environment to learn in". Academics reported that pass rates in assignments for the unit were up on previous years" and that "students had consulted a more diverse range of sources, referenced them correctly, and the general quality of academic argument had improved."

At the time of publication, InfoQuest had established a presence in eight of the university's eleven schools, and the aim was to integrate into the other three by the end of the 2002/03 academic year.

Pennie D et al   From virtuous to virtual: the collaborative development of information skills at the University of Hull. *Vine 122 pp 17-21* **London: LITC**

After an introduction to the history of information skills training at Hull University, Pennie goes on to describe the development of a generic online skills training module, Blackboard CourseInfo, which has been embedded into the Blackboard VLE. The driver behind this initiative was the overwhelming number of students requiring skills training and both the lack of library staff to deliver this face to face, and the lack of timeslots in which training could be scheduled.

Pennie acknowledges that a generic library and information skills module is not a wholly satisfactory training tool. The "subject specific" element must be introduced, and this has been done by providing an "extra chapter" with links to appropriate subject resources and "helpsheets". This raises an important question about strategies for embedding such modules in VLE-delivered courses (see the paper by Stubley below).

There is a hint though, that tutors are themselves taking on board the task of embedding the generic module into their own subject modules by "pointing to it at the appropriate time" in their teaching.

Pennie concludes by expressing his view that "The collaborative developments described in this article have led to information skills and ICT skills becoming fully accepted as part of the University's future."

Stubley, P (2002) Skills move to VLEs. *Cilip Update 1(7) pp 34, 35*. London: CILIP

This article develops further Pennie's discussion of the effectiveness of the generic skills module as a tool for skills training. Stubley "describes how the University of Sheffield's strategy for its virtual learning environment has led to some new thinking on information skills delivery", and it is the information skills element which makes up the bulk of the article.

It begins, however with some interesting general observations on the form which the library's presence within the university's VLE should take. Stubley suggests that rather than create a "kind of information way-station in addition to the library's substantial set of web pages" he would "prefer to see the library working closely with academic departments to integrate services into courses and modules delivered over WebCT to ensure that information resources and course content are knitted together seamlessly for the full benefit of students."

Stubley goes on to describe the Quick Start generic skills module and how links to library resources can be embedded at both a macro and micro level. He makes the interesting point that using the generic skills model not only loses subject focus but also wastes some of the useful tools offered by the VLE environment. He says "The disadvantage of using the generic skills model is that you lose the link with subject-focussed, practical applications. This not only deprives students of the opportunity to experiment with relevant resources but also, in a VLE, bypasses some of the possibilities and advantages of the technology", and goes on to say "User education

works best when fully integrated into the academic programme … in a similar way, information skills modules will be fully effective only when embedded in the core course programme as an active ingredient of the VLE."

1.2.4 Some evidence from the worldwide community

AUSTRALIA

In a country where communities are as highly dispersed as in Australia, it should be no surprise that there has been much interest and activity in the development and provision of online learning and the resources to support it. A key player in the field is the COLIS consortium. COLIS[13] is an alliance of five Australian Universities and five e-learning vendors who, with the help of government funding, have come together to achieve five goals, the first of which is to "share knowledge and expertise in developing the functional and technical architectures necessary for institutional systems interoperability". Members of the COLIS consortium have published numerous papers both under the COLIS umbrella and elsewhere.

A particularly prolific writer and conference speaker is **Neil McLean**, who as well as being a university librarian, is described in his profile for the ALIA 2000 Conference as having "contributed extensively to national and international thinking on the application of information technology to library and information services" and as being "a catalyst for extensive debate on sustainability issues relating to the national library and information infrastructure, particularly for Australia's research community". McLean is also Director of the IMS, Australia.

McLean's publications include:-

McLean, N (2000) Library Services for a Managed Learning Environment. Macquarie University. http://www.lib.mq.edu.au/conference/mclean/managed/
This conference paper raises questions and issues rather than attempting to answer them. McLean explores the implications of creating an online managed learning environment, and describes the considerable challenge which university libraries face if they are to deliver information and services within the online managed learning environment. This paper also explores the key issues which have to be resolved if

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[13] http://www.colis.mq.edu.au/

libraries are to remain effective in an increasingly competitive online learning environment.

In a section entitled "Positioning Libraries in the Online Managed Learning Environment" for example, McLean states that "The key to library initiatives in terms of making available digital repositories of highly used material is to ensure ease of access through providing full interoperability between the digital repository and the learning management system. This in turn raises matters of technical interoperability relating to authentication and authorisation, which have yet to be solved. The other important process to be managed in providing such a service is copyright compliance, which is tightly allied to the issues of authentication and authorisation."

These technical issues, coupled with a holistic awareness of the organization and the learning experience, really form the bedrock of all of McLean's subsequent writing, and it is interesting to see how his thinking develops.

McLean N (2001) Learning and Digital Library Environments: an IMS perspective. *Educause in Australasia Conference 2001*
http://www.gu.edu.au/conference/educause2001/papers/Neil_McLean.doc
This conference paper "looks at the principal challenges inherent in the development of technical infrastructure from an IMS perspective". McLean describes the IMS Global Learning consortium and explains the relevance of this to the Australian education sector.

McLean N (2002) Interoperability convergence of online learning and information environments. Australia: COLIS

http://www.colis.mq.edu.au/news_archives/convergence.pdf

This article is useful because it provides an explanation of the technical concepts which underpin the convergence of the two different systems. McLean describes in some detail issues which impact upon interoperability, such as metadata, digital repositories, learning objects, learning management systems, authentication and authorisation, digital rights management, portals and learning space.

However, in line with his previously expressed "holistic" approach, McLean acknowledges that technological change "challenges traditional power bases" and that "interoperability agendas are often thwarted by the protection of 'turf' at all levels

within an organisation, or between organisations." He believes that "clear transparent technical agendas are the only answer to resolving territorial protection".

McLean N (2002) Libraries and E-learning: organisational and technical interoperability. Australia: COLIS

http://www.colis.mq.edu.au/news_archives/lib_e_learning.pdf

Again this is a paper arising from seminar / conference presentation. In it McLean speaks of work recently undertaken by COLIS, and presents the concept of the "learning and information space". The component parts of this space have been modelled, and the interactions required to make it "come to life" have been mapped. The next stage in the process will be to "build demonstrator examples which show how these system chunks can be integrated". The coupling of learning and information is quite deliberate because, he says, "no online learning environment can be successful without relatively seamless access to information resources at the point of need. The challenge remains to find a balance between systems support, 'learning containers', information resources and sound pedagogical principles."

McLean examines the role of librarians in what he defines as the online "learning space" and suggests that they need to find ways to "surface their information resources in these new learning spaces" and "'fold' information into the learning experience." He also explains the nature of the technical challenges implicit in achieving the integrated environment.

The next paper is on similar lines, but this time the author is one of the five e-learning vendor partners, and is therefore written from the "e-learning standards" perspective. Dalziel focuses particularly upon the "Demonstrator" phase mentioned by McLean.

Dalziel J (2002) Reflections on the COLIS (Collaborative Online Learning and Information Systems) Demonstrator Project and the "learning object lifecycle". *In A Williamson, C Gunn, A Young and T Clear (Eds.) Winds of change in the sea of learning: Proceedings of the 19th Annual conference of the Australasian Society for Computers in Learning in Tertiary Education.* **Auckland, New Zealand: UNITEC Institute of Technology.**

http://www.colis.mq.edu.au/projects/dalziel.doc

Although there is some cross-over between the two papers, Dalziel writes an interesting section on "Demonstrator Challenges" of which he identifies four:-

- the "most fundamental" was "the difficulty of finding a common language for discussion"

- the difference between e-learning and library worldviews and the challenges of integrating these perspectives into a coherent framework which draws from the strengths of each field

- the incorporation of digital rights management with learning objects

- a cluster of issues around identity management – knowing who the user is, and what they are permitted to do

As a footnote to the COLIS work and McLean's writing, it is interesting to note that both are reported in two online newspapers, with articles by Eric Wilson in the *Sydney Morning Herald*.

Online learning set to become much smarter
http://www.smh.com.au/articles/2002/07/20/1026898931797.html
and in *The Age*, a Melbourne online newspaper
Sending the e-teachers off to school
http://www.theage.com.au/articles/2002/08/03/1028157861642.html

Other papers from the Australian perspective

Clark J (2001) An integrated online learning environment – what does it mean for the library? *The New Review of Libraries and Lifelong Learning pp 79-93.* **Cambridge: Taylor Graham**

Judith Clark is a Research Officer at James Cook University, Australia. This article describes progress towards an integrated on-line information environment for teaching, learning and research at the University.

Clarke describes how despite the lack of a corporate e-learning agenda at the University, the Academic Support Division (ASD) is building a basic "shell" in Blackboard, LearnJCU, for every University subject, on the premise that "If we build it, they will come."   At a minimum the shell for each subject will be populated with various items including "generic links to relevant supporting resources such as library subject guides" but the hope is that tutors will provide much more. Indeed, the ASD

foresee that "student demand will be a major driver to encourage lecturers to relocate (this) material to LearnJCU".

Clarke lists the various library resources which could be transferred to the Blackboard shell, including skills training modules, and envisages that "students will expect not only to be able to see what texts are required, but to be able to click through to buy the textbooks from the Bookshop. They will expect the learning system to give them the functionality to reserve a recommended text that is held by the library, or view an electronic copy of a journal article."

She further envisages students studying within a subject portal with links to resources embedded within the Blackboard modules. "These links can be embedded at any level. Such links make it easy to move between subject content developed by the lecturer and the richness of the wider information environment as provided by the traditional library. For example, when a reading list is provided online, the student will not have to leave the course environment to conduct a search in the local library catalogue; rather, by clicking on the reading list item, the library holdings record should be displayed, giving the student the option to place a hold on the item. In the case of a journal citation, where licensing permits, the student would be able to click to the electronic version of the article without being prompted for further authorisation"

It is worth noting that one external resource mentioned by Clarke is the Resource Discovery Network (RDN).

In conclusion, Clark makes the point that although the nature of the university library may be changing, its "fundamental objectives" remain "to manage access to information resources and to provide services that support users".

McCarthy J (2001) Integrating library services into the elearning environment at Queensland University of Technology. *Australian Academic and Research Libraries 32(3.)* http://www.alia.org.au/aarl/32.3/mccarthy.html

This article by Jenny McCarthy describes how the library at Queensland University of Technology (QUT) has "developed and refocused its services in order to ensure that these services are now integrated with, and supportive of, new teaching and learning initiatives and client needs." She gives a number of examples of these new integrated services.

Firstly, QUT has developed its own software for an online teaching framework, OLT (On Line Teaching) and "Liaison librarians work with academic staff to link information directly into online courses."

McCarthy also reports that the move to learning in an online environment has led to a greater need to embed skills training into learning modules, and although it is unclear whether subject specific skills modules are provided in every instance, she does say that this need has led to closer working relationships between librarians and tutors.

A further example of collaboration is with another university library, Griffith University Library. Since 1998, staff from the two libraries have jointly produced a gateway to high quality web resources and will continue to "collaborate in the identification and description of relevant web-based information sources. The catalogues of the individual institutions will be the primary access points for web-based information sources." And the aim is to provide seamless integration between online teaching pages and catalogue records.

Another initiative has been the development of a database of "heavily used digitised course materials" to provide "managed and transparent access" to copyright materials.

In conclusion, McCarthy reports that these and other services have resulted in students being given greater flexibility in their time and place of study, and has provided them with valuable lifelong learning skills.

Young C and Stokker J (2001) Course materials database: integrating information resources into online teaching for students at QUT. *Australian Academic and Research Libraries 32(3)*
http://www.alia.org.au/aarl/32.3/young.stokker.html

Caroline Young and Judy Stokker both work in Queensland University of Technology (QUT) library. Their paper describes the course materials database project at QUT which "provides students with electronic access to the majority of their lecturer directed information resources via online teaching web pages for each subject. … The project integrates online information resources with courseware, conveniently arranged for the student in one place."

The database was developed in response to student demand for access to a one-stop shop for their course materials.

Major benefits of the database have been that

- students no longer need to search a variety of places both digital and physical to find their high use, lecturer-directed information resources

- duplication of resources in different places has been eliminated

- distance students can now access their course packs online, although they will still have the choice to have paper packs posted to them, as it is "not a requirement that distant students have internet access".

The project has created new alliances between staff, though the authors note that these alliances were not always easy; indeed they say that the major difficulties which the project encountered were "to do with people".

In conclusion, the authors state that the creation of the database has streamlined and improved access to information resources from within the online learning environment, and has therefore provided a better service for students.

USA

Introduction

In 1996, the USA's first educational technology plan was released. "Getting students ready for the 21st century: meeting the technology literacy challenge."[14] This report presented a vision for the effective use of technology in elementary and secondary education (though not in universities). This vision was updated in 1999 when the US Department of Education reviewed the plan and published five amended national educational technology goals[15]. The goals do not mention digital libraries as such, but Goal 3: "All students will have technology and information literacy skills" and Goal 5: "Digital content and networked applications will transform teaching and learning" suggest that these may be needed. Although these initiatives were aimed at schools, the information skills and the networked learning culture which they foster should transfer to the University environment.

Alongside this commitment to educational technology has been a strong interest in the development of digital libraries such as that of the Library of Congress[16], of

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[14] http://www.ed.gov/Technology/Plan/NatTechPlan/
[15] e-learning Putting a world class education at the fingertips of all children
http://www.ed.gov/Technology/elearning/
[16] http://www.loc.gov/,

collaborative organisations such as the Digital Library Federation[17], and of worldwide alliances, such as the Pacific Rim Digital Library.[18] Some, indeed, have the vision of a "global virtual library, online to serve all education"[19].

Despite such a strong national agenda driving information skills and information literacy, and despite the commitment in the USA to building and providing access to digital libraries and to developing VLE products and services, it proved very difficult to find descriptions of how integration of the two was occurring at anything other than a "macro" level.   This finding is also reflected by Roccos (2001)[20] who states that "distance education is in the news almost daily" but is led to ask "but where is the library mentioned in all of these accounts?" She describes her own literature searching experiences and concludes that "Percentages show that there is almost no interest in the education field for studies about library resources" and suggests that her figures "seem to indicate that hopes for the future of libraries in the distance education explosion are dim."   Even a resource with such a promising name as "Library Support for Distance Learning"[21] which contains several hundred links to journal articles and websites yielded only one pertinent US link.

A few authors are addressing integration issues, however, and these are given below. They are an eclectic mix, with no real emerging themes.

Abbott, Thomas E. (1997) Maine College Cyber-Programs Offered Internationally. *The Journal of Library Services for Distance Education 1 (1).* http://www.westga.edu/~library/jlsde/vol1/1/TAbbott.html
This article from 1997 predicts within twenty years the emergence of "techno-cyberlibrarians", "expert managers of information", both within and outside of the sphere of higher education.

From his own experience as Dean of Learning Resources at the University of Maine, Abbott has observed increased collaboration between librarians in different libraries and between librarians and faculty. He sees two emerging roles for librarians in

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[17] http://www.diglib.org/
[18] http://www.prdla.org/
[19] http://ecolecon.missouri.edu/globalresearch/
[20] Roccos, L J (2001) Distance Learning and Distance Libraries: Where Are They Now? **http://www.westga.edu/~distance/ojdla/fall43/roccos43.html** *Online Journal of Distance Learning Administration, Volume IV, Number III, Fall 2001*
*State University of West Georgia, Distance Education Cente*r

online learning environments. Firstly, they will provide support for faculty who are developing courses. "Faculty"; he says "are becoming more and more willing to work with 'companion' librarians who team with them to create information management learning opportunities in their distance-delivered academic courses". Secondly, he sees a role for librarians in the control, management and organization of information from the Internet, and even suggests that they might become rich by selling their expertise in this area!

Lee J A N (1999) Interactive learning with a web-based digital library system. *In Ninth DELOS workshop on digital libraries for distance learning.*

http://courses.cs.vt.edu/~cs3604/DELOS.html

This paper suggests that tutors themselves may not find the "separate digital library" model useful. Lee describes how with support from the NSF, and in preparation for the advent of "distance education", the faculty of the Department of Computer Science at Virginia Tech constructed a number of on-line courses in support of the undergraduate program. At the start of the project a "digital library" was produced to support a Computer Science module "Professionalism in Computing" (i.e. computer ethics). It was soon realised, however, that the digital library model did not appeal to many tutors, because "no matter how good the textbook, how extensive the resources, how detailed the notes, every faculty member has their own way of presenting materials, adding their own imprimatur and incorporating their own experiences". Instead tutors were allowed to organise library resources "according to their own desires" in a more flexibly structured model.

The main thrust of this article is a study of the development of the learning content of the module and of "active learning", but the module, with its attendant library resource model was used by other university students from a variety of social backgrounds and was well received.

Edge SM and Edge D (2000) Integration of Information resources into distance learning programs. *Education at a Distance 14(7*)

http://www.usdla.org/html/journal/JUL00_Issue/story01.htm

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[21] Sloan B and Stoerger S Library Support for Distance Learning http://alexia.lis.uiuc.edu/~b-sloan/libdist.htm#reports

This article questions whether one reason why tutors are seemingly reluctant to include information resources in their online teaching, might be their own lack of skills and knowledge of how to do this. Edge and Edge question whether as a result, "distance learners are being provided with equitable access to appropriate learning resources."

Edge and Edge make the point that most post-secondary institutions allocate a significant portion of their budgets for library and information resources which, when used effectively, can contribute significantly to a campus culture of research-based education. Yet they claim that rather than purposefully integrating information resources and competence into the curriculum, faculty "often cede the responsibility for research to students" and that even distance learners are sent to the library "to figure out whatever they can for themselves about how to access research material".

They claim that many lecturers do not know how to integrate electronic information resources into their courses, and suggest that they need to "get over any embarrassment they may have about not knowing how to use some of the more advanced features of the library's electronic databases and become learners of some of the newer electronic research skills themselves". Most librarians are well aware of the importance of information competency skills and eager to assist teaching faculty with instructional design to integrate information literacy into the curriculum.

Edge and Edge make an interesting distinction between different kinds of libraries. They suggest that "digital libraries" are "online extravaganzas of historical images, documents…" etc. such as the Library of Congress's American Memory Project. "Virtual libraries" they say are generally "aggregators and holders of subscriptions to electronic databases and serve as the portal to those databases for the libraries that are members of the virtual library consortium". "Distance learning libraries", on the other hand, are "a highly tailored, full-service information service that operates essentially as a special library and provides special librarian and knowledge management assistance for an institution's distance faculty and students."

They go on to discuss the services which a "distance-learning library" might provide, including information literacy instruction for tutors on a one-to-one basis.

In conclusion, they state that the integration of information resources into distance learning is not easy, and requires new collaborations and partnerships. It also

requires sensitivity to the training needs of the teaching staff who are constructing the content of the new learning resource.

Borgman C L *et al.* (2000) Evaluating Digital Libraries for Teaching and Learning in Undergraduate Education: a case study of the Alexandria Digital Earth ProtoType (ADEPT). *Library Trends 49(2) pp 228-250*. USA: University of Illinois at Urbana-Champaign

This is an interesting article reporting on an as yet unfinished NSF funded project, which goes part way to showing the kind of integration sought for this review. The project website is at http://www.alexandria.ucsb.edu/conn/ It describes the development and deployment of a digital library of geo-referenced information resources in undergraduate courses at the University of California. It also presents a case study which suggests that there is "a positive correlation between integrating electronic information sources into the classroom and increased scholastic success".

A small team of instructors and researchers constructed "I-scapes", or sets of online digital information tools and resources tailored for use in specific lectures. So although the delivery mode is to be computer-based instruction, the setting is the traditional classroom lecture. The project aims to show that the five core skills necessary for scientific thinking can be improved by using online digital resources. The authors will assess the learning outcomes of these lectures in a structured and rigorous way and thereby hope to learn how best to construct and integrate subject specific information resources into teaching modules, though unfortunately there is no mention of taking the next step into the online or distance learning environment.

Pitt S P, *et al.* (2002) Integrating digital images into the art and art history curriculum. *Educause Quarterly 2 pp38-44.* USA: Educause

This article gives a practical example of how an image database was integrated into an online learning module. Pitt describes how a team of staff at James Madison University, including "a librarian with experience in metadata", developed a large and flexible image database and how this is being used to create a "slide shows" for integration into Art and Art History teaching modules. The database can be used by a teacher in a classroom or by students in an online learning environment. Students gain access to online course materials through the MDID (Madison Digital Image

Database) gateway from where they can select a lecture previously constructed by their tutor, or a learning path through the images. From the lecture, the student has access to images, catalogue data, notes and annotations provided by the instructor.

Feedback includes comments from a lecturer, who says the benefits are that students "can have easy access to images not found in their textbooks, which gives me greater choice and creativity in constructing lectures, assignments, exams. This is particularly important with regards to teaching the arts of Africa, Oceania, and the Americas, where few textbook options exist. …. (students) can call up the artworks and take time to really study them, to see them".

Another benefit is that the database "facilitates an interdisciplinary exchange of knowledge and instructional innovation". Materials from the database have been embedded into anthropology, history, literature, media arts and design, philosophy, sociology, Asian studies, Latin American studies, religion and maths teaching modules.

Cohen D (2002) E-Content. Course-management software: where's the library? *Educause Review May/June 2002 pp12-13.* **USA: Educause**

This article discusses the integration of course-management software with the digital library, stating that such integration is "essential for getting the maximum value from the institutional investments of both money and expertise".

Cohen makes an interesting comment on why libraries have been "left out of alliances of CMS (course-management systems) vendors with portal companies and other providers of content", namely that "vendors overlooked their (library systems developers') resources because librarians generally were not involved in the software-purchasing decisions made by their institutions, which often buy course-management software as part of integrated administrative packages for automating a range of functions campus-wide."

Cohen also suggests that institutions need to scrutinize more closely whether CMS and digital libraries do actually contribute to the improvement of learning.

Linneman SR (2002) Combining Course Management Systems and Digital Libraries to bring interactive multimedia to the geoscience masses.
http://gsa.confex.com/gsa/2002AM/fianlprogram/abstract_46026

This is a conference paper with a promising title, but only the abstract has been tracked down, and the link no longer works. The paper is to do with the integration of digital library sources into Geology teaching materials at Western Washington University.

Shank JD and Dewald NH (2003) Establishing our presence in courseware: adding library services to the virtual classroom. *Accepted for publication in Information Technology and Libraries to appear probably in March 2003.*

This article urges libraries to establish a presence in courseware. "for the most part academic libraries have been all too absent in the design development, and implementation of courseware. As a result, faculty do not think of integrating library resources directly into their courseware-enhanced courses." The authors raise the fear that this might lead to libraries being sidelined or ignored, and suggest that libraries and librarians need to "insert" themselves into courseware.

This, they say, can be done at **macro level,** where various highly visible and easily accessible library services can be provided, including OPAC and database links, a virtual reference desk, global pathfinders and help sheets, document delivery services. An alternative is linking at **micro level**, where individual librarians and faculty members work together to provide customised materials for courseware modules. The benefit of micro level linking is that "the closer the link between course assignments and the library resources to help with those assignments, the greater likelihood the students will access the library information". The "down side" is that this is time-consuming for both library and teaching staff.

Shank and Dewald conclude with a warning – "If university and college libraries do not find a means by which to establish our presence in courseware, we could face the frightening prospect of faculty and students alike viewing the library as an insignificant place to obtain the scholarly resources they need for their courses. Rather, commercial information distributors, who have already gained a foothold in some courseware environments, may successfully eclipse the library as the primary information provider."

NETHERLANDS

It is clear that there is an extensive programme of digital library activity in the universities of the Netherlands. Tilburg University, for example has hosted seven "International Summer School on the Digital Library" events covering a range of topics. The 2001 Summer School included Digital Libraries and Education as one of its themes, and an overview of the papers presented can be found at:

Prinsen, JGB (2001) A challenging Future Awaits Libraries Able to Change: Highlights of the International Summer School on the Digital Library. *D-Lib Magazine 7 (11).* USA:D-Lib

http://www.dlib.org/dlib/november01/prinsen/11prinsen.html

The speakers included Hans Roes, Deputy Librarian at the University of Tilburg, who spoke about "developing digital libraries as natural complements to digital learning environments to support educators with respect to the selection of adequate resources for a given course" and Herbert Van de Sompel (then at the British Library, but formerly of Ghent University) who spoke about and has indeed published many papers on reference linking and OpenURLs.

Hans Roes's paper was published in full prior to the Conference, and can be found at

Roes, H (2001) Digital libraries and education: trends and opportunities. *D-Lib Magazine* 7(7/8) USA:D-Lib http://www.dlib.org/dlib/july01/roes/07roes.html

The paper covers a range of the recent changes in education, specifically digital libraries and digital learning environments (which Roes describes as being naturally complementary); digital portfolios; information literacy; collaborative course design; the relation between physical and virtual environments and the implications for library staff.

Roes contrasts the approaches of the UK and the USA. The former, he says "takes the needs of specific courses as point of departure" as exemplified in the Inspiral report, and likens this to the "work of reference librarians putting together reserve collections to support courses". The USA, however, he says takes the macro approach to library support for learning environments and "concentrates on learning resources in general."

In an interesting section on collaborative course design, Roes speaks about how active learning styles necessitate "a role for librarians in the multi-disciplinary teams developing learning." As an example of this he suggests DEsite http://drcwww.kub.nl/dbi/instructie/eu/en/FS0.htm an online teaching module developed at the University of Tilburg by lawyers and library staff to "explain the complexities of the decision making process in Europe." Roes explains that "together they have built a learning environment that individually they could not have produced easily. The DEsite shows the synergy that is possible, and the result is a rich learning environment for students and an electronic reference tool for lawyers active in this field."

SOUTH AFRICA

The literature searches uncovered a single journal article from South Africa.

Myers G *et al.* (2002) Beyond the virtual library: electronic curriculum Web resources. *The Electronic Library* 20(6) pp 473-480. UK:MCB

The authors of this article are a Librarian and a Cyber Librarian at the Health Sciences Library, and the Head of the Centre for the Study of Exercise, at the University of the Witwatersrand, Johannesburg, South Africa. The article describes how an electronic problem-based teaching module for medical students was enhanced by the integration of web-based resources.

The approach taken by the librarians was to build a pilot demonstration site around a paediatric asthma case, because they "found that lecturers seemed unable to grasp the concept and possibilities of integrated digital resources based solely on description". Within the module, they designed small icons to indicate links to different kinds of resources and integrated a range of resources including test results required for diagnosis, lecture notes, links to evaluated URLs and to the University's print or e-media subject resources. The article includes a detailed explanation of how the module was constructed, with examples of several screenshots.

Feedback from staff and students has been good, especially from medical staff studying at a distance, and for the librarians the main satisfaction has been the move from "merely supporting the curriculum into true integration of the curriculum with the library's resources."

1.3 Summary and comment

The picture from the UK tends to suggest that the impetus to integrate online information resources or the "digital library" into the online learning environment is coming less from the teaching than from the learning support / library community.

In some institutions, such as Leeds and Edinburgh, the Library seems to have retained its autonomous presence and identity. Leeds appears to have successfully integrated library staff and their skills into the online learning community by forging alliances with academic staff, while retaining their "library" identity. Edinburgh, in contrast, raises a concern that the library might become sidelined and warns of the consequences should this happen.

One area in which librarians do seem to have made their mark is in information skills training, and the examples of how this training is being embedded into online learning environments in a user centred way are encouraging. However, the question remains as to how "deep embedding" might be achieved in a way which emphasizes and enhances the disciplinary context.

It is now not uncommon for library staff and their services to come under the umbrella of "central learning support", or they are "information specialists" within a multi-skilled or interdisciplinary team. The Edge Hill example illustrates how successful such alliances can be, and that interdisciplinary and indeed cross-institution collaboration may be needed for success.

Firm institutional support from the highest level, with a clear policy for e-learning and the services which support it are undoubtedly key success factors. If this is not in place, even the best-intentioned initiatives can prove fragile. A fascinating insight into how the withdrawal of such support can lead to the collapse of a developing e-learning programme is given by Stephen Brown in his article "Re-engineering the

University" mentioned above[22]. Brown describes how the problems of a distributed university campus were addressed by the introduction of networked based learning underpinned by library and digital library services among others. A change in policy resulting from the appointment of a new Vice Chancellor led to the withdrawal of the budget and the collapse of the 'e-campus'.

It is interesting to note that developments in the UK are paralleled elsewhere. The examples from QUT in Australia reflect similar experiences to those of UK academic librarians, and it will be interesting to see how the pioneering work at James Cook develops in the face of limited corporate support.

In the USA, where large-scale digital library and e-learning initiatives predominate, it is noticeable that those who work "on the ground" to provide information resources for the user in the online environment are calling for closer alliances between library and information workers and academics, as in the UK and Australia. It is interesting too that the sensitive subject of the skills needs of academics in the online environment is raised by Edge and Edge. If academics do not have good information handling skills and are reluctant or unable to acquire them, it is hardly surprising if they tend to pass the responsibility for identifying and seeking out online information resources on to the student.

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[22] see 3

Section 2. Survey of Higher Education Institutions in the UK

2.1 Method

A request for information was sent to Heads (or equivalents) of UK academic libraries via the SCONUL email list in November 2002. This initial request was deliberately "kept simple" to encourage as large a response as possible. Respondents were asked to tell us about

- their involvement in any current development work at their institution involving the integration of digital library resources and services into VLEs

- whether they had published anything as a result of their work

- and whom we might contact for further information.

To date 32 responses have been received, out of a possible 170. Seven of these are from DiVLE projects. The responses have not yet been followed up (this will occur in the next phase of the Project), but initial findings are reported below.

2.2 Results

2.2.1   Stage of development reached.

No activity - only two HEIs report no activity at all. One of these has "bid for funding but not been successful", and the other is "trying to feed into areas where Schools are developing VLEs independent of any institutional policy".

Planning to start or in the early stages of development - twelve institutions said they were "just starting" or "in the early stages" of integration activities. These were:-

- Durham is at the strategic planning stage, and aim to link their online resources and Blackboard.

- Liverpool John Moores has received a small University grant to investigate links for Psychology, Education and Health. They have also developed a customizable information skills module for use within the VLE

- The London Institute aims to go beyond simple links from Blackboard to the library web pages, to implement TalisList, and are investigating using Heron

- Middlesex is in the initial stages of looking at how to link WebCT modules to the library catalogue and other web resources

- Manchester Metropolitan is developing online information literacy tutorials and will also use TalisList linking to WebCT or faculty intranets. In a separate initiative, the Department of Information & Communications is developing a WebCT module on reference citation.

- Newcastle is looking at the interface between Blackboard and Aleph

- Oxford is aiming to link their electronic resources and Bodington (from Leeds)

- Roehampton (University of Surrey) is piloting its VLE, so the library has a "watching brief" but expects progress over the next twelve months

- Sussex has an MLE in its early stages of development but will be exploring how to link this to TalisList

- Teesside is also liaising with Talis, uses Blackboard, and is developing an MLE

- University of Wales College of Medicine is "debating and reviewing" their VLE requirements, but there is evidence that the library is involved in this initiative and works closely with the Learning Technology Unit

- University of West of England is considering setting up an LIS skills module for use within Blackboard.

Established activity – eighteen Universities reported established programmes (though at times it was difficult to differentiate between these and some who claimed to be "in the early stages")

- The Arts Institute at Bournemouth is developing its library resource on the intranet and library modules within Blackboard with links planned between the two

- Birmingham is focusing on the integration of RDN resources at present

- Bradford is working on integrating library resources into Blackboard. Library staff are training academic staff to link to OPAC records, electronic journals and databases

- Brighton is integrating Blackboard and their library web page with links at module level, and is also embedding links to reading lists

- Chester College of HE has a qualified librarian working with departments to enhance their VLE with links to appropriate electronic resources. The Library is also beginning to develop web-based information skills sessions

- Chichester uses Campus Pipeline and have created a "My Library" tab which is sensitive to the student's subject area

- Edinburgh is involved in a DiVLE project.

- Huddersfield is involved in a DiVLE project

- Kingston is linking its VLE to full-text e-journals and journal articles, to e-books and to reading lists. It is also considering the library's role in providing advice on course "cartridges" and books with linked websites

- Leeds is involved in a DiVLE project

- London Metropolitan uses WebCT and links to subject resources in the library web pages. They also use TalisList

- LSE is involved in a DiVLE project

- Newport is involved in a DiVLE project

- Northumbria integrates library resources into VLEs at "top level" and within modules. Library staff have produced guidelines for academic staff on incorporating e-library material into their Blackboard modules

- Sheffield uses TalisList to incorporate information resources directly into WebCT.

- Sheffield Hallam has seconded an Information Adviser to their e-learning project for one year to support and develop the integration and use of electronic information resources in the VLE

- Southampton Institute has developed instructions for academic staff on how to link from the VLE to a wide range of library resources. They are piloting

use of HERON, investigating NetLibrary for e-books and ReadingsListDirect for reading lists. They are also developing an information skills tutorial customized for different subjects.

- Ulster is involved in a DiVLE project

- The University of London Library is developing a Virtual Research Environment (VRE) as part of a wider electronic campus initiative for students in London and abroad.

2.3 Summary and Comment

The interest which is being shown in the integration of library resources into the online learning environment is encouraging, and suggests that in the institutions which responded to the survey, library staff do work in partnership with others to achieve this end. It is noticeable, however, that most initiatives are library-led rather than responses to demand from academic staff or students.

The type and depth of integration of digital library resources into online learning environments varies quite considerably, and some extra examples of this activity are given below:-

- four libraries have "library modules" within their VLE, and two link students from their VLE to subject resources on the library web pages.

  The **Arts Institute at Bournemouth**, for example, is developing an unusual library web page at http://intranet.aib.ac.uk/library/index.html which will be linked to library modules on Blackboard

- around half of the libraries are integrating deeper links to individual OPAC records (rather than just to the OPAC itself) and to articles in journals and databases.

Manchester Metropolitan University Library has recognized the need for "a structured co-ordinated effort to develop new ways of supporting learning and teaching in the electronic environment". The University has a member of staff, part of whose remit is to help tutors to embed library resources, e-books, websites etc into electronic courses. The Library has targeted and prioritized subject areas and is training its staff to use WebCT.

- eight libraries report using or developing the use of TalisList

- a similar number already provide or are developing information skills modules within the VLE and tailored to be subject specific

- four (Bradford, Northumbria, Sheffield Hallam and Southampton Institute) are either making presentations to lecturers or have produced guidelines for them explaining how to integrate online resources into their VLEs.

Northumbria's guidelines are available from its Learning Resources Department at http://www.unn.ac.uk/central/isd/bbguide1.htm. They provide comprehensive initial guidance for staff wishing to integrate electronic library resources into course material within Blackboard, but also alert them to the limitations on what is achievable. It is interesting to note that the first item in the guidelines is "Liaison", encouraging lecturers to involve the "appropriate information specialist" from the outset, and explaining how he or she can help. The guidelines then list the wide range of electronic resources available, including websites, and locally digitized documents. They give some pointers towards finding other resources, explain briefly at what level linking can be done, and raise issues such as off campus availability, password barriers, license restrictions, copyright, file sizes and downloading times, testing, digitizing document and obtaining permissions, house style, and information and IT skills. The guidelines are rounded off with two case studies.

The Learning Centre at **Sheffield Hallam University** has also produced "Guidelines for integrating electronic resources into your Blackboard course". These are to be found on the learning centre website at http://www.shu.ac.uk/services/lc/ssb/elecresourcesblackboard.html

They offer advice on embedding resources and help with issues such as accessibility, copyright, licensing, digitizing, finding resources, information skills, linking to resources including reading lists, off-campus access, and passwords. One-to-one help is offered from a whole range of people - Information Specialists, the e-learning project, the VLE Information Adviser, the at-elbow e-learning advisers and departmental e-learning co-ordinators. Links are provided to all of these.

Southampton Institute Library provides guidance for those integrating electronic resources into Learnwise or website course materials. This can be accessed at http://www.solent.ac.uk/library/linking/default.stm. The guidance covers linking to the library catalogue, exam papers, electronic books, journals, magazines and newspapers, databases, and the library web pages.   For each type of resource general instructions are given on how to construct links and there are numerous helpful examples.   Warnings are issued about passwords, off-campus access and copyright throughout the guidelines. Further help is offered from subject specialist library staff.

- Several libraries particularly mentioned the importance of being part of a team of library and academic staff

CONCLUSION

The initial findings from this phase of the Link^{ER} Project confirm that while there are extensive literatures on digital libraries and on virtual learning environments, relatively little has been published on the integration of the two concepts. Practical experience is largely limited to rather superficial linking, such as a button in the VLE to link out to the digital library service, although there are exceptions. The area where most progress appears to have been made to date appears to be in the delivery of information skills tuition, although

even here there is limited evidence of deep embedding. However, the survey of UK academic libraries suggests that the whole issue is now receiving widespread attention and it may be expected that the overall picture will change significantly in the next few years.

It has been noted that the vast majority of published evidence suggests that initiatives to link libraries and VLEs come from the library perspective: there is little evidence that education practitioners, strategists or theoreticians have identified the issue as being of significance. This has resulted in a major gap and weak pedagogical underpinning of many initiatives that have taken place.

A further issue, given the frequency of references to <u>distance</u> learning and <u>digital</u> libraries in the literature is whether initiatives currently taking place will address the learning needs of higher and further education students in the reality of UK practice, which remains overwhelmingly place-based or at most hybrid.

This background study suggests that the DiVLE Programme is both timely and well-targeted. LinkER will be examining project progress and outcomes against the background identified in this Report during its next phase.