The Virtual Learning Environment as a Transformational Technology for Academic Libraries

David Ball
Bournemouth University
dball@bournemouth.ac.uk
B201

1   Abstract

This paper discusses the explosion in the use of electronic resources by students and the development of e-books. The existing high usage of e-resources will be intensified as virtual learning environments (VLEs) become the primary means of interaction between students and universities. The development of a bespoke subject collection of e-books for nursing students is explored in some detail, as is the demand for non-traditional resources for the VLE. The paper closes by discussing the opportunities for integrating resources into and exploiting VLEs.
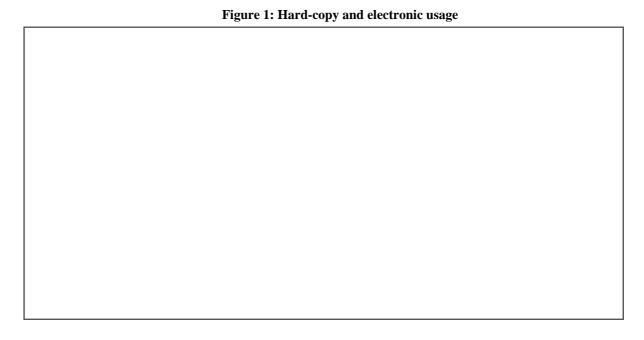
2   Context

2.1   Student Use of Electronic Resources

The overwhelming popularity of e-resources has long been recognised. Morse and Clintworth [11], reporting on electronic journal use in an academic health science library, record an overwhelming preference for the electronic form: 28,000 viewings of full-text articles, compared with 1,800 uses of the corresponding print volumes. They conclude that "the overwhelming magnitude of the electronic usage must primarily represent the satisfaction of needs that were previously unmet in the print domain".

Tenopir's digest and analysis of earlier surveys and research studies [14, p.45) document two intuitively quite obvious facts. First, convenience "remains the single most important factor for information use. Desktop access, speed of access and the ability to download, print and send articles are top advantages of electronic journals" for all groups of users surveyed. Second, younger users are more enthusiastic adopters and rely on electronic resources more heavily.

These trends are evident in statistics from my own library (see Figure 1). Downloads of full-text articles from e-journals and, in the last year, from e-books have increased from 280k in 2002/3, through 485k in 2003/4 and 618k in 2004/5, to 639k in 2005/6. This represents a rise of 128%. Over the same period issues of hard-copy books have dropped from 327k to 263k. This represents a decline of close on 20%, of which 7% occurred in 2004/5 and 12% in 2005/6. We await next year with interest, to see whether the decline levels off.

Figure 1: Hard-copy and electronic usage

At the same time reshelving surveys are showing very low usage of hard-copy journals. One interesting factor is that Bournemouth has traditionally been a teaching rather than a research university. This high and increasing use of the

electronic journal literature is overwhelmingly by undergraduate and taught postgraduate students, rather than by researchers.

A further interesting point is that usage is extremely high in our Institute of Health and Community Studies. Here the majority of students are working nurses, studying part time, who tend to be older and more technology-averse than their counterparts entering university straight from school. Convenience is obviously a major contributory factor here: the availability of e-resources 24x7, on campus, in hospital libraries, or at home. Recent statistics show that 72% of these students access electronic resources from home.

We are therefore seeing an explosion in the use by undergraduates of journal articles, traditionally more the preserve of the researcher, because of the factors documented by Tenopir: convenience of availability and the preference of a younger generation for the electronic form. Use by undergraduates is not intensive, as it is by researchers; however it is widespread and increasing.

2.2   E-books

Although we have become used to providing access to e-journals, e-books present some additional problems, partly because of the extent of their individual content. Library users are either tied to a screen to read large volumes of text, or obliged to print it themselves. This is not the way that users, or librarians, have worked with hard-copy books, and the numbers making intensive use of e-books, particularly textbooks, comprising the whole undergraduate population, will be much larger than the numbers making intensive use of e-journals. Cultural and technical difficulties (network and hardware availability, printing capacities and costs) are potentially much more critical.

E-books have taken a number of forms. Initially they were intended to be read on dedicated hardware devices. However take-up was very slow, because of cost, lack of available hardware, poor on-screen readability and lack of a robust catalogue of available titles [8]. The norm now, particularly in higher education, is for a software solution (such as Adobe) run on a PC, laptop or PDA.

E-books over recent years have become available in greater numbers, through multiple channels, from both publishers and aggregators. However, the industry is still in the very early stages of development. Herther [8] identifies the following problems and obstacles:

- Lack of a clear open standard for operating systems;

- Fears about the protection of content and the rights of the content owner in the context of giving users flexibility;

- Lack of appropriate content in suitable quantities;

- Pricing of titles, software and hardware;

- Lack of integration into the general market for books.

We may however be about to witness a leap forward. There are reports that Apple's next iPod will have a much larger screen and a book-reading mode. Apple is also reported to be acquiring rights to the content of at least one publisher [4]. If this is true, and if Apple has the functionality right, the next five years could see a transformation of book buying on a par with the current transformation of the recorded music market, where music downloads overtook sales of traditional singles in 2005 [7].

2.3   The Virtual Learning Environment

The virtual learning environment (VLE) is not a particularly new phenomenon. It has however now gained widespread acceptance, and will prove itself to be a transformational technology, changing fundamentally how students and their universities interact.

One can define a VLE as "the components in which learners and tutors participate in 'online' interactions of various kinds, including online learning". The principal functions of the VLE are:

- Controlled access to curriculum that has been mapped to elements (or "chunks") that can be separately assessed and recorded.

- Tracking student activity and achievement against these elements using simple processes for course administration and student tracking that make it possible for tutors to define and set up a course with accompanying materials and activities to direct, guide and monitor learner progress.

- Support of on-line learning, including access to learning resources, assessment and guidance. The learning resources may be self-developed, or professionally authored and purchased materials that can be imported and made available for use by learners.

- Communication between the learner, the tutor and other learning support specialists to provide direct support and feedback for learners, as well as peer-group communications that build a sense of group identity and community of interest.

- Links to other administrative systems, both in-house and externally. [6]

A different view is offered by Secker [13], who identifies five major tools that are integrated within the VLE:

- Content delivery tools – teaching materials in a wide variety of formats (audio, video, PowerPoint, as well as text) are made available to students in one convenient place, generally accessible only to the students of the institution.

- Communication tools – allowing many-to-many interaction through means such as bulletin boards and discussion groups.

- Assessment tools – enabling formative or summative assessment, self-testing, diagnostic testing or formal assessment; complete with automated marking as appropriate.

- Course management tools – enabling tutors to record data about students' progress, to track individuals or groups of students; students are also able to submit assignments and upload presentations.

- Course resources – learning resources not produced in-house can be uploaded or linked to.

VLEs are also being integrated into the wider university systems environment, including student records or registry systems, finance systems and learning resources. This wider context is called the Managed Learning Environment (MLE).

3   Challenges for the Library Profession

The explosion in the use of electronic resources is well known and well documented. As VLEs become the normal medium for interaction between students and university throughout their learning, the electronic medium will become the norm for all learning materials, just as it already is for students' social and leisure pursuits.

Work started in 2002 by Markland and Kemp [9] showed that initially there was little integration of library-procured learning resources into VLEs. The two systems (library web-site access to e-journals and the institutional VLE) were seen by academics creating resources for VLEs to be separate and discrete. However, the student perception of the ideal provision is "to have resources to support their learning delivered to them online with the speed of a search engine, and the 'quality stamp' of their university library or their tutor's recommendation".

We therefore face a two-fold challenge. First, we must develop our procurement practice to achieve as much control as possible of the market in electronic information resources, particularly the developing market in e-books. Second, we must grasp the opportunity to integrate library resources into the VLE and to use the VLE creatively to interact with students and staff.

4   Procurement

4.1   E-Books

The background to procurement in UK higher education and the importance of understanding and following the standard procurement cycle have been dealt with elsewhere [3, pp.45-61]. Details of the Southern Universities Purchasing Consortium's (SUPC) innovative tender for e-books were well aired at Internet Librarian International in 2005 [2]. However it is worth examining the progress of one aspect of this tender in some detail, since it seeks to address the question of textbooks, which are particularly relevant to the VLE.

Two distinct requirements were identified in the tender:

Requirement A: a hosted e-book service from which institutions can purchase or subscribe to individual titles;

Requirement B: a hosted e-book service of content that is specified by the institutions. It was anticipated that this service could be subject based and subdivided by subject area.

Despite offering business models derived from the hard-copy world, e-book aggregators do not fulfil one basic requirement of any hard-copy aggregator: namely that they will supply any book from any publisher. To overcome the restricted nature of the content on offer, Requirement B of the tender (a hosted e-book service of content that is specified by the institutions) addressed bespoke collections. Before the SUPC tender, work had been under way by a group of universities (Anglia Ruskin, Bournemouth, Glasgow Caledonian and West of England) and the Royal College of Nursing (RCN), to define a core collection of nursing texts for use in higher education, based on the Libraries for Nursing/RCN core collection for nurses (the NCCI). The object was to negotiate with aggregators to make this collection available in electronic form, in order to overcome some of the problems experienced by nurses in higher education, who work and study in different locations under great time pressure.

This nursing collection was seen as the first in a series of bespoke subject collections to be defined by higher education. There would obviously be potential benefits both to students, who would have access to prescribed reading material in electronic form, and to the aggregators, who would be assured of take-up by the higher education community. One problem that arose was the well known issue of core textbooks that sell in relatively high volumes (see for instance Armstrong, Edwards and Lonsdale [1]). Publishers may be unwilling to make these available to libraries at economic prices because they will lose substantial revenue form sales to individual students.

Since the award of the tender under Requirement B to Ebrary, work has continued on the NCCI. Core lists of 200 and 600 titles have been identified, with the large majority of titles coming from 12 publishers. Ebrary has reached agreement, or is close to agreement, with 11 of these 12 publishers on the principle of providing content.

However, the high sales-volume textbooks remain a problem, with publishers for obvious reasons unwilling to release them under the present business model. There are two potential solutions.

First Ebrary has suggested a very different business model for libraries, focusing on the 40 UK universities providing nursing education. This model is under development with NCCI, and will probably be closer to the hard-copy model with which publishers are more comfortable. The second possibility, although one that is proving difficult to sell to publishers, is for students themselves to purchase the textbooks in electronic form. Access would last for the duration of the student's course, and the price would be lower than the hard-copy price. The advantage for the publisher is that they cut out the large market in second-hand hard-copy textbooks, profiting every time a book is sold to a student. The advantage for the student is a discounted price, combined with high functionality. The advantage for the library is that there is no longer a need to buy and circulate large numbers of textbooks.

4.2   Non-Traditional resources for the VLE

Over the past 10 years we have come an enormously long way in making electronic resources available to our users. Access to large collections of e-journals is commonplace in higher education. The availability of e-books is picking up, and, thanks to work such as the tender mentioned above, libraries are beginning to influence the type of content published in e-book form. The open access and institutional repository movements are growing in compass and effect. The wide adoption and efficient exploitation of VLEs will however require a range of non-traditional resources not developed in-house, and will in some areas foster the development of new markets.

Lecturers and course teams will obviously produce their own content for delivery through the VLE. This will of course not be limited to textual material, but will include the widest range of formats – video, audio, databases, simulations etc. – and increasing levels of interactivity.

Libraries have as we know for many years supported academic staff in procuring and producing content for course packs, originally in hard-copy but increasingly in electronic form (see McClelland and Hawkins [10] for a series of case studies based on Liverpool John Moores University). Services such as HERON and the British Library's copyright-cleared service in the UK have sprung up to support such developments.

Free open access course materials are starting to appear on the web. The best known example is MIT's Open CourseWare, which provides "open access to the syllabi, lecture notes, course calendars, problem sets and solutions, exams, reading lists, even a selection of video lectures, from 1250 MIT courses representing 34 academic disciplines" (http://ocw.mit.edu/OcwWeb/Global/AboutOCW/our-story.htm). By 2007 the number of courses is expected to

expand to 1800; the materials contained on the MIT OCW Web site may be "used, copied, distributed, translated, and modified, but only for non-commercial educational purposes that are made freely available to others". MIT estimates that there are now 51 other sites round the world offering similar, though probably not as extensive, access.

Publishers are also starting to design and publish content specifically for VLEs. Blackboard offer a range of so-called "course cartridges", which enable academics to import publishers' content directly into a Blackboard course. Often tied in to a textbook, cartridges may contain a wide range of resources, including banks of test questions, PowerPoint presentations, and multimedia objects. One type, the Open Access Cartridge, has few restrictions on usage: once downloaded it can be used in the same way as content created by the lecturer. However, Blackboard's Standard Cartridge implements copyright protection and controls access: only one cartridge may be used per course; content cannot be exported; students require an access key.

While some publishers, such as Pearson, have agreements with Blackboard to supply cartridges linked to textbooks, one can foresee a market in course content arising that is not mediated by the software supplier. Many universities do not use Blackboard or any other proprietary system, preferring open source software. Publishers, as the demand develops, will not wish to cut themselves off from a sizeable segment of the market.

This market will pose additional challenges for those procuring learning materials. As we are all aware, electronic publications are already more complex than hard copy in terms of rights management: one no longer simply puts a book on the shelf and polices copyright; licences may impose restrictions on the period of availability, permitted users or location, permitted use (non-commercial only), etc. The new learning materials for use in VLEs will bring their own complications in terms of what may and may not be done, attribution, re-use, export, number of students. Licences, pricing and the negotiation of them with a wide range of diverse suppliers will present even greater challenges. Repurposing or augmenting such materials will give rise to questions of precisely who (publisher, lecturer or institution) owns the rights to what content.

The bigger question raised by Noam [12], of whether the "ultimate providers of electronic curriculum … will not be universities but instead commercial firms" and universities become providers solely of the educational environment, is outside the scope of this paper.

5 Integrating into and exploiting the VLE

5.1 Pathways to information

Students will increasingly see the institutional VLE as a one-stop shop for all their course-related materials. It will not be possible to keep library resources separate from this environment; a major challenge for librarians therefore will be to embed resources, or links to resources, at the point of need. The course environment and the individual units constituting a course will therefore contain variously reading lists (with appropriate links), direct links to external electronic resources, links to published materials digitised in house, links to the library catalogue and website.

Use of the catalogue and website will decline, and creative ways will have to be found of encouraging students to use the wider variety of resources available to them, not simply those incorporated into the VLE by library staff.

5.2 Interaction with students

The range of sophisticated functionality provided by the VLE offers great opportunities for engaging and interacting with students.

General library materials can be incorporated at a high level within, for instance, an academic department's VLE. Tailored materials can be integrated into courses and units. These may comprise not only hand-outs and information on particular resources; they may also be recordings of, or PowerPoint presentations from, information literacy sessions delivered by subject librarians. Quiz formats can also be used, for instance in teaching how to cite references.

As well as the above materials, virtual classrooms can be used to reach groups of students remote from campus, for instance in partner institutions.

5.3 Interaction with staff

Groups of academic staff, for instance researchers in a particular subject area, can be reached by means of the VLE, using tools such as discussion boards and blogs, as well as links to resources.

The VLE may also become a useful tool internally for the library. Resources created by library staff can be very easily managed and shared within its content management system. Staff development programmes and packages can be created for continuing use.

6   Conclusion

We have examined some of the technological advances taking place: the advent of VLEs and the availability of electronic resources. They have accompanied and will fuel an explosion in the use of electronic resources, in an environment where students expect "the same robust connectivity and service orientation that they have experienced in the commodity world" [5].

There are obvious challenges here for librarians, in negotiating and exploiting the new geographies of electronic learning and resources, and we have examined two means of meeting these challenges.

First, our innovative e-books tender offered the opportunity of sending a strong message to the emerging e-book marketplace. Lessons have been learnt from the often painful experience of the e-journal pioneers. Higher education needs flexibility, both in terms of business models and access to resources. We are not willing to be forced into the straight-jacket of the hard-copy medium when the electronic form offers so much more. Nor are we prepared to accept the restrictive and expensive business models that some aggregators seem to be forcing on us. In terms of content, we are also seeking to take the lead initially in the area of procuring bespoke titles for our nursing students.

Second, we have identified opportunities for librarians to embed resources and user education into the VLE, increasing convenience and interactivity for our users, and affirming our relevance to the learning process.

Of course, only time will tell how successful we have been in shaping the marketplace and seizing these opportunities.

References

[1]   C. Armstrong, L. Edwards, R. Lonsdale. "Virtually There?: e-books in UK academic libraries", *Program*, **36**, 216-227, (2002).

[2]   D. Ball. "A new model for procuring e-books", *Internet Librarian International 2005: transcending boundaries: information technologies & strategies for the 21st Century*, compiled by Carol Nixon and Jennifer Burmood (Medford: Information Today, 2005), pp.154-162.

[3]   D. Ball. *Managing Suppliers and Partners for the Academic Library*, London, Facet Publishing, (2005).

[4]   R. Block. *Apple to do eBooks?* [online], Engadget. Avai;able from: http://www.engadget.com/2006/07/22/apple-to-do-ebooks [accessed 8th August 2006-.

[5]   J.J. Duderstadt, W.A Wulf, R. Zemsky. "Envisioning a transformed university", *Issues in Science and Technology*, **Fall**, (2005). Available at: http://www.issues.org/22.1/duderstadt.html.

[6]   R. Everett *MLEs and VLEs explained*, London, JISC, (2002). Available at: http://www.jisc.ac.uk/index.cfm?name=mle_briefings_1.

[7]   *Financial Times*. "**Music downloads** overtake traditional single sales for first time". *Financial Times*, 7 January, 2006, p.3

[8]   N.K. Herther. "The E-book Industry Today: a bumpy road becomes an evolutionary path to market maturity", *The Electronic Library*, **23** (1), pp. 45-53, (2005).

[9]   M. Markland,. B. Kemp. "Integrating Digital Resources into Online Learning Environments to Support the Learner", *Networked Learning Conference 2004: a research-based conference on networked learning in Higher Education and Lifelong Learning*, (2004). Available at: http://www.shef.ac.uk/nlc2004/Proceedings/Symposia/Symposium9/Markland_Kemp.htm

[10]   R.J. McClelland, N. Hawkins. "Perspectives on the Use and Development of a Broad Range of E-books in Higher Education and their Use in Supporting Virtual Learning Environments", *The Electronic Library*, **24**(1), pp. 68-82, (2006).

[11]   D.H. Morse, W.A. Clintworth. "Comparing Patterns of Print and Electronic Journal Use in an Academic Health Science Library", *Issues in Science and Technology Librarianship*, **28**, (2000). Available at: http://www.library.ucsb.edu/istl/00-fall/refereed.html.

[12]   E. Noam. "Electronics and the Decline of Books: the transformation of the classroom", in *Forum Futures 1998: exploring the future of higher education*, pp. 29-31, (1998). Available at: http://www.educause.edu/ir/library/pdf/ffp9807s.pdf.

[13]   J. Secker. *Electronic resources in the Virtual Learning Environment: a guide for librarians*, London, Chandos Publishing, (2004).

[14]   C. Tenopir. *Use and Users of Electronic Library Resources: an overview and analysis of recent research studies*, Washington, Council on Library and Information Resources, (2003). Available at: http://www.clir.org/pubs/reports/pub120/pub120.pdf.