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Abstract

There has been an explosion in the use of electronic resources by students; this 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 challenge facing academic libraries is to provide appropriate resources in electronic form and through interfaces meeting the expectations of the Digital Natives. This paper examines the marketplace for e-books and reports on Bournemouth University's innovative response to this challenge: leading a national tender not only for general collections of e-books, but also for bespoke subject collections; integrating existing resources into the VLE and creating new resources; exploiting the VLE and federated search technology. It also reports on Bournemouth's current Higher Education Academy-funded pathfinder project, Innovative E-Learning with E-Resources (eRes), to develop innovative pedagogic frameworks and an e-reading strategy.

Keywords

Virtual learning environments; electronic resources; e-books; academic libraries

1   INTRODUCTION

1.1   The Digital Natives

In 2001 Marc Prensky pointed to a singularity - "an event which changes things so fundamentally that there is absolutely no going back" – in education. This singularity was the "arrival and rapid dissemination of digital technology in the last decades of the 20th century". Today's university students are the first generation to have grown up surrounded, and conditioned, by this universal digital technology. Prensky's evocative name for them is the Digital Natives. Those of us who grew up in the pre-digital age are the Digital Immigrants. The major problem identified by Prensky is that Digital Natives and Digital Immigrants speak different languages (pp. 1-2).

The differences as regards education have been elaborated by Jukes and Dosaj (2006, p. 37) and are expressed in the following table:

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|Digital Natives                           |Digital Immigrants                       |
|Parallel process & multi-task             |Singular process and single or limited task |
|Prefer picture, video and sound to text   |Prefer text to picture, video and sound  |
|Random access to interactive media        |Linear, logical sequential access        |
|Interact/network simultaneously to many   |Interact/network simultaneously to few   |
|Comfortable in virtual and real spaces    |Comfortable in real spaces               |
|Prefer interactive/network approach to work|Prefer students to work independently    |
|Prefer multiple multimedia information    |Prefer slow controlled information release –|
|sources rapidly                           |limited sources                          |
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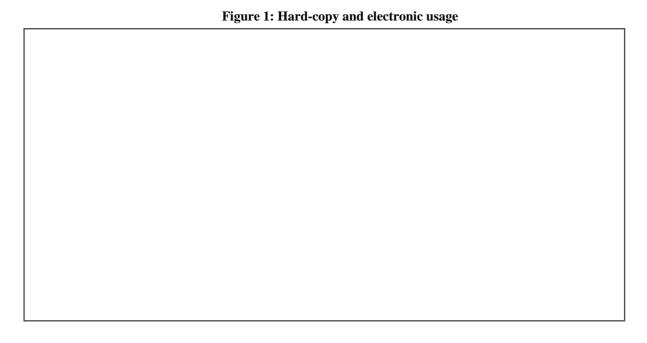
This discontinuity is here to stay - the expectations and experience of the Digital Natives are entirely different from those of the Digital Immigrants - and differences will only intensify over time. Our challenge therefore is to provide an environment and resources that satisfy both the expectations of the Natives and the needs of the curriculum. Bournemouth University's pathfinder project, Innovative E-Learning with E-Resources (eRes), is a step towards meeting that challenge.

1.2   Student Use of Electronic Resources

The overwhelming popularity of e-resources has long been recognised. Tenopir's digest and analysis of surveys and research studies (2003, 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, the Digital Natives, are more enthusiastic adopters and rely on electronic resources more heavily.

These trends are evident in statistics from Bournemouth University Library (see Figure 1). Downloads of full-text articles from e-journals and, latterly, from e-books have increased from 280,000 in 2002/3 to 690,000 in 2006/7. This represents a rise of 146% in four years. Over the same period issues of hard-copy books have dropped from a peak of 349,000 in 2003/4 to 272,000 in 2006/7. This represents a decline of 28% in three years. However the aggregate of

hard-copy loans and electronic downloads has risen from 620,000 in 2002/3 to 962,000 in 2006/7 – a rise of 55%. This suggests that students and staff are reading more, or at least accessing a wider range of materials. Of course no statistics are available for free resources from websites, which must add significantly to the figures for electronic resources.

Figure 1: Hard-copy and electronic usage

There is research evidence to show that this increase in the volume of reading is repeated elsewhere. Liu's survey (2005, pp. 704-6) of staff and graduate students at San Jose University shows that 67% of respondents spend more time on reading in the digital age, while 32% have experienced no change. This is partly due to fact that each document of the web has on average 9 links to other documents. The survey also showed big increases in browsing or scanning, reading selectively, and non-linear reading. These findings and our experience indicate that students and staff are reading more documents but are increasingly selective in what they read within a document.

Returning to our own statistics, one interesting factor is that Bournemouth has traditionally been a teaching rather than a research university. In the 5 years 2002/3 to 2006/7 we have therefore seen an explosion in the use by undergraduates of journal articles, traditionally 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. This is borne out by Hernon's study of e-book use by undergraduates (2007, p. 7), which found that, despite both forms being electronic, respondents preferred e-journal articles to e-books because they were shorter and more packaged. Respondents also tended to read very selectively. Use by undergraduates (Digital Natives) is not intensive, as it is by researchers; however it is widespread, increasing and tends to be granular and selective.

Hernon also found that students are selective when downloading or printing – partly because of cost. Bournemouth's usage of ebrary's Academic Complete collection in 2006/7 bears this out. Of the collection's ca. 40,000 titles, nearly 12,000 (30%) were consulted at least once in over 55,000 user sessions, giving an average of 4.7 titles consulted per session. Just over 700,000 pages were viewed (about 60 per title on average). However only 17,000 pages were copied (1.5 per title) and 21,000 printed (1.8 per title), giving an aggregate of 38,000 pages (3.3 per title). This does not represent wholesale copying or printing by students.

Another interesting factor is that this high usage of e-books in the ebrary collection occurred before catalogue records appeared in the OPAC, although there were links from reading lists, a good publicity campaign and prominent links to ebrary on the Library's e-resources web page. Many studies (including ebrary's own) suggest that really high usage is achieved through the traditional OPAC route. This may be the case where titles appear on reading lists (and there is no link from reading list to e-book). However these statistics seem to represent a different kind of usage, where the collection is searched and exploited as a database rather than a collection of 40,000 discrete entities.

The view of e-books as databases, rather than aggregations of individual titles, is also evident in two recent studies. The experience of Staffordshire University, also an Ebrary subscriber, is similar to Bournemouth's. Parkes (2007, pp. 259-260) notes the value of the database approach, searching across 30,000 titles, and characterises students as

hunters, seeking the most useful extracts rather than browsing. This is of course a reflection of the trend towards fostering the independent learner rather than one spoon-fed on a limited range of textbooks. Belanger (2007, p.208) also notes that many libraries treat other large collections of e-books, such as Early English Books Online and Eighteenth Century Collections Online, as databases, not cataloguing individual titles.

In summary we see clear trends emerging in usage of e-resources by Digital Natives: they seek granularity in the retrieval of information, are selective in what they read, copy and print, but are accessing more and more materials. Our practice in supporting and providing resources for these independent learners through VLEs must respond to these trends.

1.3   The Virtual Learning Environment

One can define a virtual learning environment (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. (Everett, 2002)

The introduction of VLEs has seen a steady and consistent growth in the UK, (Browne, Jenkins and Walker 2005). Their implementation and development within universities has already seen some changes in teaching practices and they are becoming a transformational technology, changing fundamentally how students and their universities interact. Evaluations undertaken at the University of Durham (Newland, 2003) showed that both staff and students had the opinion that the VLE is promoting more effective learning. In 2001, 81% of staff rated the effectiveness of the VLE as a learning resource as either excellent or very good and this increased to 93% in 2002. In both years 18% of staff felt that their basic approach to teaching had changed in part because of the VLE and 69% (2001) and 78% (2002) stated that even if their basic approach had not changed they could now do certain things better by using it.

One of the main reasons that many staff use a VLE is to enhance their teaching (Newland et al., 2004). The most frequently cited factor affecting the further development of VLE use is the issue of time (Browne and Jenkins, 2003). The result of staff having difficulties in finding the time, amongst other competing demands, reinforces small scale developments to supplement face to face delivery, in an evolutionary approach. "Wider institutional adoption of eLearning requires re-development and re-design of existing courses and represents a significant time investment. New course developments therefore provide the most accessible opportunities for significant change, with existing provision continuing to adapt through evolutionary change." (Newland, Jenkins, Ringan, 2006)

2   THE CURRENT E-BOOK MARKET

In the longer term there are encouraging signs in the e-book market. The study undertaken by EPS for the British Library (Powell, 2004) on publishing output in 2020 predicts that parallel publishing will grow; only 12.5% of UK academic monographs will be uniquely print by 2020. However growth may be slow: only 10% of new titles will be uniquely electronic by 2014, which is set to rise to 40% by 2020. By 2014 the proportion of academic monographs available in electronic form (uniquely electronic or in hybrid form) will rise to nearly two thirds.

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 (Block 2006). 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.

However in the short term there are a number of impediments. The complexity of the business models and licences for e-books is documented by Wicht (2006); this makes it very difficult for librarians to make purchasing decisions, particularly within tight budgets. Only a small proportion of titles are available electronically: Just (2007) estimates that there currently about 135,000 English language e-books available to the US market, only about 11% of the print offering. Bennett and Landoni (2005) have also noted the reluctance of publishers to make titles, particularly textbooks, available because of fears of lost revenue.

These impediments are echoed in a study undertaken by CHEMS for the JISC (quoted in Woodward, 2007), which found:

> • Ignorance in the HE sector of what e-books are available;
>
> • Low awareness within HEIs of the value and relevance of e-books;
>
> • Poor understanding by library staff and publishers of each others' needs;
>
> • Complexity of access routes to aggregators' or publishers' platforms;
>
> • Too few e-books are available;
>
> • Available e-books are not up to date or relevant to UK users;
>
> • Pricing models are not appropriate;
>
> • Publishers are not making the right textbooks electronically available on the right terms.

This combination of the overwhelming preference of students for electronic materials and of e-learning permeating universities is creating the expectation amongst students that all materials should be available electronically. Students are starting to ignore hard copy, even when recommended reading, in favour of electronic alternatives from whatever source. The challenge for academic libraries is to provide appropriate resources in electronic form and through interfaces meeting the expectations of the Digital Natives. Bournemouth University and other organisations in the UK are responding to this challenge in a number of ways.

3 THE PROCUREMENT OF E-BOOKS

3.1 The SUPC Tender for E-books

The first response was the Southern Universities Purchasing Consortium's (SUPC) innovative tender for e-books (a detailed analysis of the tender process can be found in Ball, 2005). 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.

It is worth examining the progress of Requirement B in some detail, since it seeks to address the question of textbooks and recommended reading, which is an inhibiting factor in the e-book market of particular relevance to the VLE. Despite generally offering business models derived from the hard-copy world, e-book aggregators do not fulfil one basic requirement of any hard-copy aggregator: namely to supply any book from any publisher. To overcome the restricted nature of the e-book content on offer, Requirement B of the tender 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, 2002). Publishers may be unwilling to make these available to libraries at economic prices because they fear the loss of substantial revenue from sales to individual students.

Since the award of the tender under Requirement B, 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. Our aggregator has agreements with 11 of these 12 publishers, on the principle of providing content. However, recommended reading, as well as the high sales-volume textbooks, remains a problem, with publishers unwilling to release them under the present business model. Progress in developing appropriate business models and making these texts available has been slow, but is now gathering pace with ebrary taking a strong lead.

3.2 **The JISC** National E-Books Observatory Project

A further development is the JISC **national e-books observatory project, which continues the focus on business models and subject collections of textbooks and recommended reading** (http://www. jiscebooksproject. org/)**. It** "will assess the impacts, observe behaviours and develop new models to stimulate the e-books market, and do all this in a managed environment". The core original aims were to:

- License a collection of online core reading materials that are highly relevant to UK higher education taught course students in four discipline areas.

- Achieve a high level of participation in the project by making the e-books available on the bidders own platform (where appropriate) and on a variety of e-book aggregator platforms. Higher education institutions will thus have the option to access the e-books on platforms they already use and which are familiar to their users.

- Evaluate the use of the e-books through deep log analysis and to asses the impact of the 'free at the point of use' e-books upon publishers, aggregators and libraries.

- Transfer knowledge acquired in the project to publishers, aggregators and libraries to help stimulate an e-books market that has appropriate business and licensing models.

To this end 30 titles in four subject areas (business, engineering, media and medicine) have been licensed, following consultations with libraries, for a period of two years. They will be freely available to higher education libraries together with catalogue records for integration into collections and VLEs. During all of 2008 a deep-log analysis will be undertaken to provide quantitative information about users in the four subject areas, their behaviours and patterns of use.

The advantages and benefits are seen to be as follows (Woodward, 2007):

- Provide an in-depth understanding of how e-books that support UK higher education taught course students are actually used in teaching and learning;

- Enable publishers, libraries and aggregators to assess the demand for core reading list e-books;

- Enable all parties to measure the effect of free at the point of use e-books on the buying behaviours of students;

- Enable libraries to measure the benefits and potential costs of providing core reading list e-books to students;

- Inform the creation of appropriate business and licensing models;

- Inform the promotion of e-books within an institution;

- Raise awareness generally of e-books throughout the academic community;

- Stimulate the e-books market in a managed environment.

This is an innovative approach that should yield interesting results. Some concerns have however been expressed about the small number of e-books to be made available and the consequent validity of evidence derived from the deep-log analysis, particularly if it is hoped that the evidence will affect publishers' decisions on making core reading list books available. The fact that each title is only available on one aggregator's platform (Ovid for medicine, MyiLibrary for the rest), and not on the library's platform of choice, may affect usage and the generic application of the analysis: usage may for instance not reflect the database approach discussed above. These problems may be overcome if the results can be validated by comparison with usage through libraries' preferred platforms. The Taylor and Francis titles on media studies have been available through other platforms, such as ebrary, for some time: comparisons may be possible between libraries.

Together it is to be hoped that these initiatives will give rise to business models satisfying publishers, libraries and students, enabling the integration of more content into the e-learning environment. Publishers must realise that, if their content is not available electronically, it will not be used, much less bought, by students; if it is not used by students it will not be bought by libraries.

4 INTEGRATION OF RESOURCES INTO THE BOURNEMOUTH VLE

Work to integrate Library resources into the Bournemouth VLE (known as myBU) has been concentrated in five areas: reading lists, e-reserves, exam papers; federated searching; and a dedicated Library tab (a fuller description is given by Beard et al., 2007).

At a very basic level, myBu has offered a great boost to the humble reading list. Forty-four course clusters now have over 1,500 reading lists available in myBU, one click away from the individual course units. Fully interactive, they link directly to the electronic resource or to the Library catalogue, and are immediately accessible and visible. This has provided that long sought catalyst to encourage academic staff to keep the lists up to date and to include more electronic resources. The lists for our e-business course are now exclusively populated by e-resources.

The eReserves area of myBU has provided an opportunity to address another challenge, that of managing the Short Loan Collection, i.e. printed items in high demand. This has always been a labour-intensive and inefficient process. eReserves obviously functions as a host to born-digital e-resources. Perhaps more importantly, it can also provide access to scanned items and copyright-protected documents, which need to be managed or controlled. Using the Copyright Licensing Agency's (CLA) Scanning Licence, a programme of work has scanned course-related material in the Short Loan Collection. These items now total over 200 and include book chapters, all of which can be made available to targeted student audiences at appropriate points in their courses. Overall the Collection has more than halved in the last year to around a 1,000 items. Only 50 hard-copy journal articles remain, which fall outside the scope of the scanning licence. The replacement of books from this high-demand Collection is more problematic. However, it is encouraging that the next wave of e-book availability from a different aggregator should enable another 100 titles to move from print to electronic form and so be available for integration into the VLE.

Past exam papers have traditionally been stored in printed format within the Short Loan Collection. The system was cumbersome and time-consuming to maintain, and also open to abuse through theft and vandalism. Electronic versions of exam papers for the past four years are now available through the University's Staff Portal. Academic staff can then link them to relevant units within myBU. There is also a link to the exam papers on the Library web page. Students are therefore provided with unlimited electronic access to a heavily used resource from various entry points.

In addition to the resources available through the individual course units, there is a Library tab on myBU. Although in its first iteration it simply linked to the Library web page, it now links to a cluster of modules designed to enable fast access to both resources and help. Students use this to access the databases, e-books and e-journals not included in their reading lists, and all the other advice and content usually made available. The log on to myBU now enables a customised view of the help and advice which includes pod casts and Blogs and the potential for the introduction of Wikis and the SCHOLAR social bookmarking tool.

Perhaps the greatest enhancement has been the integration of a federated search engine into the Library tab. From its first launch in September 2007 it had the capacity to trawl over 60 resources with Athens authentication, as well as giving the user choice about whether to include not only full text content but also the Library Catalogue and Google Scholar. This has the potential to simplify students' access to resources by searching across databases, whether internal or external. As well as the VLE itself, an obvious internal target is the institutional repository of Bournemouth's research output, which will become more and more significant for students with the increasing focus on research-led teaching.

5 HIGHER EDUCATION ACADEMY PATHFINDER PROJECT

Bournemouth's innovative approach has been recognised by the award of pathfinder funding by the UK's Higher Education Academy for a project entitled Innovative E-Learning with E-Resources (eRes). eRes, which began in May 2007, seeks to develop active approaches to learning in an online environment through the exploitation and integration of e-resources. It will adopt an action research methodology that will encourage reflection and change for the individual and the organisation.

The first and most important focus is the development of innovative pedagogic frameworks in the form of case studies that bring together learning activities and academically led quality e-resources within the unit of study. Each will start with an exploration of the alignment of intended learning outcomes and teaching strategies, and the identification of appropriate e-resources. The case studies of different approaches will include:

- collaborative learning through group work made possible by the provision of multiple simultaneous users of e-resource with online discussions or blogs;

- reflecting on current events through Web 2. 0 technologies;

- understanding concepts through the social construction of knowledge in a Wiki;

- individual learning from feedback from quizzes relating to e-resources;

- developing critical thinking skills by comparing and contrasting e-resources;

- problem based learning with students finding and analysing statistical data to solve problems.

The second focus is the e-reading strategy, which will help redefine the traditional concept of reading for a degree and build on previous studies of enabling access to e-resources. The current scope of e-resources will be identified and an assessment made of strategies needed to exploit them to their fullest. This scope has radically changed this year, through the CLA scanning licence allowing us economically to deploy 10% of digitised content from any UK published work held in BU's print library collection. If this is exploited to its logical conclusion students will be able to work in groups accessing key information from a number of sources in a way that would never have been possible through traditional library lending. Although the development of e-content by publishers as course cartridges or digitised texts under the HERON scheme (http://www. heron. ingenta. com/) can offer bespoke content, there are significant cost implications for such deployment. By exploiting readily accessible e-resources, including CLA scanned items and social bookmarking, this project will drive practical and affordable innovations in pedagogy and working practices.

6 THE FUTURE

This paper has pointed up some of the innovative responses to the challenge by one academic library. There are many other initiatives that will also shape library provision in the future. But publishers must also play their part and respond quickly to the requirements of students and libraries. Davy (2007) notes that, although publishers of textbooks have been competing strongly by incorporating more and more online features, over the past 3 years the market has been static in value terms; given annual price increases of 5%, this translates into a significant decline in sales volumes. He attributes this decline to two factors: the move to independent learning, and Digital Natives' expectations of digital, packaged, just-in-time resources. His vision for the future is not books on screens, but digital

learning objects: related content at a granular level (articles, chapters, case studies, the open web, databases) clustered round learning objectives and delivered through VLEs. Publishers need to learn from community (such as MySpace) and music sites (such as iTunes) how content is packaged, accessed, mixed and shared by the Digital Natives. A similar point is also made by Wheatcroft (2006): content will need to be viewed as a set of assets to be developed, used, re-used, recombined, updated, traded transmuted into a range of clearly differentiated products.

Academic libraries and publishers stand at a critical junction. The arrival of the Digital Natives in universities, coinciding with the adoption of a transformational technology, the VLE, requires a fundamental shift in the creation and provision of learning resources.

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