

The subject librarian and the virtual learning environment: a study of UK universities

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Abstract

Purpose – The prevalence of virtual learning environments (VLEs) in higher education is well-documented and has been promoted in the UK by government-funded projects, but there has been little empirical research on the level of involvement of subject librarians with VLEs. The survey was designed to investigate how VLEs are affecting the work of subject librarians and to examine factors influencing their use in providing electronic information resources and developing information skills.

Design/methodology/approach – A questionnaire was distributed electronically to a purposive sample of 132 subject librarians at seven UK universities. The instrument contained mainly closed specified-response questions with a few open questions and obtained a response rate of 43% ($n=57$).

Findings – Use of VLEs by subject librarians varies both between and within institutions. Factors affecting this include the subject area, co-operation of academic staff and attitudes of librarians towards technology-based teaching. JISC-funded projects have enabled better use of VLEs through the creation of re-usable learning objects and development of pedagogical understanding and skills. Recognition by academic staff of the teaching role of subject librarians has a critical impact on their involvement with VLEs.

Research limitations – The timeframe limited the scale of the study and size of the sample. The mainly quantitative approach limited the detail and depth of responses, but sufficient data were collected to establish broad trends, illuminate important factors and identify key issues.

Originality/value – The study provides empirical evidence of how VLEs are affecting the day-to-day activities of subject librarians and suggests areas where further research would be valuable.

Keywords Academic libraries, E-learning, Learning technology, Subject librarians, University libraries, Virtual learning environments

Paper type Research paper

Introduction

The function of the academic library has shifted from a centre in which physical collections of resources are managed to a significant point of delivery for important services (Brophy, 2005), with an increasing focus on technologies supporting this goal. The literature identifies the virtual learning environment (VLE) both as a way of organizing online information and learning resources by subject, and as a medium for delivering crucial information skills and information literacy tutorials developed for library users.

Britain and Liber (1999:3) define VLEs as “learning management software systems that synthesise the functionality of computer-mediated communications software (e-mail, bulletin boards, newsgroups etc) and on-line methods of delivering course materials (e.g. the WWW)”. Of particular significance in relation to library and information services, they “aim to accommodate a wider range of learning styles and goals [than the classroom environment], to encourage collaborative and resource-based learning and to allow greater sharing and re-

use of resources” (Britain and Liber, 1999:3). Other terms are used for VLEs, particularly outside the UK: Virkus et al. (2009) identify several variants, but those most commonly found in the library literature are course management software or systems (CMS) and learning management systems (LMS) or learning content management system.

A UK survey conducted on behalf of the Universities and Colleges Information Systems Association (UCISA) found the most often cited reasons for implementing a VLE were to enhance teaching and learning, and to reach distance students (Jenkins et al., 2005). One way in which VLEs are being used to fulfil teaching aims is in providing access to learning objects (LOs), such as interactive database tutorials for information skills training, which can be used by for timetabled sessions, self-paced learning and revision; storing LOs in institutional repositories offers the potential for them to be copied, customised and linked into the VLE for reuse by different audiences (Franklin and Stubbings, 2004). Wiley (2000) comments on the proliferation of definitions and taxonomies for LOs, but offers a useful working definition of LOs as “any digital resource that can be reused to support learning”, explaining this can range from an online image or audio file to web pages delivering a complete learning experience.

VLEs have well-developed resource management features, making them an attractive way of distributing course documents and enabling students to refer to them later. E-learning practitioners emphasise the importance of the “learning resource layer” in providing a good foundation of e-resources for students to access and use in resource-based learning (Hunter et al., 2005; Littlejohn, 2005). However, those who support more active learning styles criticise overuse of the VLE for storing electronic resources; Stiles (2007), for example, argues that using VLEs solely as a storage mechanism for course documents has only a limited practical function and is not making use of more valuable learning opportunities. Laurillard (2002) and Littlejohn (2005) describe how tutorials based on a constructivist pedagogy incorporate elements of interactivity and feedback into online learning modules. Laurillard (2002) also identifies constructivist elements within multiple-choice quizzes (MCQs) on the basis that feedback can be provided to students online in the absence of a teacher, but Mimirinis and Bhattacharya (2007) argue that MCQs encourage a surface learning approach. Dutton et al. (2004) and Quinlan and Hegarty (2006) assert that in practice resource-based learning is the strategy most often used by lecturers who make materials available via the VLE and UCISA reported the highest level of VLE use was in relation to its resource-based function (Jenkins et al., 2005).

VLEs are potentially a very effective way of managing access to subject-specific information resources, including licensed material such as e-journals and digitised course readings or “electronic reserves” (Black, 2008; Dutton et al., 2004). However, some commentators view the VLE as a threat to the library, because it allows electronic materials to be uploaded by academic staff and students, overlapping with the role of the academic subject librarian (SL) as a central information manager (Maccoll, 2001; Rieger et al., 2004; Secker, 2005). A critical factor here is the ability of SLs to work collaboratively with academic staff. In most institutions VLE content is maintained by academics, suggesting that SLs should form subject teams and collaborate with course tutors (Graham and James, 2007; Markland, 2003; Moore and Abson, 2002). Some observers argue that co-operation between library staff and academic staff is not well developed, making it hard for academic librarians to use the available technology to reach students (Brophy, 2005; Secker, 2004). Maccoll (2001) and Markland (2003) describe the negative impact of VLEs when academic tutors do not collaborate with librarians and resources become locked away in password-protected “silos”.

There has been a significant focus on exploring the linking of digital libraries with VLEs and trying to resolve the issues arising at an institutional or national level (Virkus et al., 2009). The Investigating Portals for Information Resources and Learning (INSPIRAL) project highlighted the importance of linking local library resources and national resources created through the Electronic Libraries (eLib) programme with VLEs (Brown and Currier, 2001). The UK Joint Information Systems Committee (JISC) has funded development projects and research reports that have provided insights into areas such as the use of resource lists, interactive tutorial creation, and collaboration between SLs and academic staff (Harris, 2005; Secker, 2005). Other published literature has often been based on the observations of practitioners at individual institutions (e.g. Cipkin, 2002; Patalong, 2003), or the opinions of professionals active in the field (e.g. Maccoll, 2001; Powis, 2004), but these accounts have not used formal research methods.

The present small-scale study aimed to address a gap in the literature by investigating formally how VLEs were affecting the role of SLs in UK universities. Bell and Shank (2004) sum up the role of the present-day academic librarian in the phrase “blended librarian”, on the basis that they are increasingly involved in a teaching and technology-centred role combined with their traditional library roles, reinforcing Biddiscombe’s (2002) description of the SL as a “learning support professional”. The SL’s role is developing as a result of both technological and pedagogical developments: two recent studies explored their changing role in UK universities and both reported significant growth in their teaching activities (Hardy and Corral, 2007; Bewick and Corral, 2010). However, Hardy and Corral’s (2007) study found that the involvement of SLs with VLEs and e-learning was lower than expected, suggesting this as an area needing further study.

The study was conducted in summer 2008 and had a particular focus on VLE use from the SL perspective, examining library practice in a cross-section of UK universities. The key areas addressed included the types of activities being undertaken via VLEs, their contribution to information skills teaching and relationships between SLs and academic staff. Its specific objectives were to:

- determine how well established the VLE is in the day-to-day activities of the subject librarian;
- examine factors influencing the use of the VLE from the perspective of the subject librarian;
- explore current and emerging issues relevant to the subject librarian’s role and use of the VLE.

The next section reviews the literature that provides the background and context for the study. Later sections outline the research methodology and discuss key findings from the survey results in relation to relevant literature and the research objectives, concluding with suggestions for further research. This paper is based on an unpublished masters dissertation (Keates, 2008), which provides fuller details of the study.

Literature review

The VLE literature reviewed here can be broadly categorised into practitioner accounts based on institutional initiatives (e.g. Black, 2008; Dale and Cheshir, 2009; Kellam et al., 2009; Solis and Hampton, 2009); reports from government-funded development projects (e.g. Franklin and Stubbings, 2004; Harris, 2005; Secker, 2005; Stanley et al., 2004) and

professional guidance or viewpoints (e.g. Biddiscombe, 2002; Maccoll, 2001; Powis, 2004; Secker, 2004). This classification is similar to York and Vance's (2009) threefold characterisation of library literature on CMS as being concerned with institutional case studies, technological innovation and "calls to action". There have been relatively few cross-institutional surveys of developments in this area: UCISA published a longitudinal analysis of three VLE surveys of the UK higher education sector (Jenkins et al., 2005), while York and Vance (2009) conducted an online survey in 2007 of academic librarians' experiences with CMS in North America. In addition, Virkus et al. (2009) have provided a review of 23 papers on the integration of digital libraries and VLEs, which updates Brown and Currier's (2001) review for the JISC-funded INSPIRAL project. This literature, together with recent studies on the teaching and learning roles of SLs, forms the backdrop to the present study.

Library integration with VLEs

Common examples of library integration with VLEs include the provision of links to the library home page and other web-based resources (e.g. catalogues, databases, past exam papers, reading lists, guides, help sheets, online reference services); the administration of digitised journal articles and book chapters as course-specific readings or "e-reserves"; the delivery of online instruction, through information literacy courses, tutorials, videos, worksheets and quizzes, often customised to particular subject fields; and the use of facilities within VLEs (e.g. announcements, email and discussion tools) to communicate directly with students (Black, 2008; Dale and Cheshire, 2009; Hedges and Secker, 2010; Robertson, 2010; Smale and Regalado, 2009; Solis and Hampton, 2009; Virkus et al, 2009; York and Vance, 2009). VLEs have been a particularly popular method of delivering digitised reading-list material to students because they help UK institutions ensure compliance with the access restrictions required by the Copyright Licensing Agency (Hedges and Secker, 2010). Solis and Hampton (2009: 84) also cite the "legal benefits" of the library mediating student access to electronic resources via the VLE and thus reducing the risk of copyright infringement by faculty.

However, the literature reveals a mixed picture of library activity at different levels and slower progress than many early commentators anticipated. Solis and Hampton (2009: 82, 84) observe that "academic libraries have struggled to find and promote their place" within VLEs and report that their own library's resources were "almost invisible" in Blackboard until a course-page project was initiated in 2006. Daly (2010: 208) describes another instance of "little presence" in Blackboard prior to a similar initiative in 2007. Smale and Regalado (2010) note that their library's Blackboard involvement was also limited to tabs for their home page and chat reference at the top level. Hightower et al. (2008) report limited integration into WebCT at their institution and Donaldson (2010: 81) notes that library staff at Nottingham Trent University had "minimal access" to a home-grown VLE prior to its replacement with a commercial product in 2008-09. As use of VLEs has expanded within institutions, a key factor driving current integration efforts is the recognition that the VLE has become "the place that the students most regularly visit" (Donaldson, 2010: 83) – not the library (Daly, 2010; Kellam et al., 2009). Another driver is the technological capacity to customise and personalise resources to improve their relevance to users (Black, 2008; Dale and Cheshir, 2009; Kellam et al., 2009).

Many authors refer to Shank and Dewald's (2003) two-tier conceptualisation of "macro-level" and "micro-level" CMS/VLE involvement to differentiate between working with central units to create a generic library presence (offering the same resources to all courses) and working with individual faculty to provide subject-specific course-related instruction and

other support (e.g. Black, 2008; Kellam et al., 2009; Solis and Hampton, 2008; Virkus et al., 2009; York and Vance, 2009). Macro-level involvement is relatively easy to achieve and maintain, even though it “often entails a hard-fought battle with reluctant CMS administrators” (York and Vance, 2009: 203). Most practitioners recognise the need for library engagement with individual courses: Dale and Cheshir (2009) report that embedding reading lists at course level increased their usage from 24% to 43% in two years. Recent case studies document continuing efforts to progress from macro- to micro-level VLE engagement (e.g. Black, 2008; Daly, 2010; Hightower et al., 2008; Kellam et al., 2009; Solis and Hampton, 2009). Several libraries have launched projects to develop course-specific resources pages or subject guides within or linked from the VLE, customised at the department, course or section level, using manual and/or automated methods, often in collaboration with academic staff (Black, 2008; Daly, 2010; Kellam et al., 2009; Solis and Hampton, 2009).

Liaison with academic staff

While many writers highlight the technical challenges of integration (e.g. Black, 2008; Harris, 2005; Rieger et al., 2004; Virkus et al., 2009), most commentators acknowledge that human and organisational issues are at least as challenging, including institutional culture and politics (e.g. Black, 2008; Maccoll, 2001; Secker, 2005; Virkus et al., 2009). Bell and Shank (2004), Feldmann (2006) and Maccoll (2001) describe how the liaison activities of SLs are particularly important in relation to VLEs, to avoid the risk of being marginalised and locked out of password-protected “rooms”. Specific barriers to library involvement include the need to negotiate coursebuilder/instructor rights at the individual course/module/unit level (Daly, 2010; Kellam et al., 2009) and the reluctance of academic staff and e-learning or IT services to grant access to librarians (Black, 2008; Hedges and Secker, 2010; York and Vance, 2009). Practitioners also report low levels of engagement with the VLE by teaching staff (Robertson, 2010) and poor awareness of library capabilities (Hightower et al., 2008). In some cases, institutional structures have facilitated involvement, where educational developers or learning technologists work within the library or alongside librarians in an academic services group (Donaldson, 2010; Dale and Cheshir, 2009).

York and Vance (2009: 202) observe that attending VLE training sessions is a valuable means of introducing librarians to IT staff and teachers as “interested players”. Librarians also report benefits from partnering e-learning departments (Black, 2008), collaborating with a technology resource centre (Hightower et al., 2008) and obtaining assistance from the institution’s VLE administrator (Kellam et al., 2009; Smale and Relagado, 2009; York and Vance, 2009). Black (2008) reports a novel solution to the issue of VLE instructor rights through creating a new formal VLE role entitled Librarian, which has all the privileges of an Instructor, apart from the grade book element, but is less confusing for everyone (and probably less contentious). Giles (2004) discusses the benefits of her “privilege” in gaining Course-builder level access (equivalent to the Librarian role described), noting that asking for the level below Instructor was key to persuading an academic colleague to agree. Other libraries have simply set up their own “organisation” (dedicated area) within the VLE to gain access to the desired functionality (Smale and Regalado, 2009; Robertson, 2010).

Implications of JISC projects

The eLib programme resulted from the Follett report’s recommendations for the exploitation of IT in UK higher education (Joint Funding Councils Libraries Review Group, 1993) and aimed to achieve significant change in the area of e-resource management. Brophy (2005), Pinfield (2001b) and Powis (2004) acknowledge eLib’s contribution in providing e-resources

at a national level that academic libraries could exploit locally. Maccoll (2001) and SCONUL (2004) highlight the importance of managing copyright clearance in this context and note the key role of the eLib Higher Education Resources on the Net (HERON) project in assisting librarians with clearance. Hedges and Secker (2010) confirm the continuing value of HERON, reporting widespread use by UK practitioners to manage digitised course readings. eLib aimed to develop the SL's role in e-resource management by creating national "subject gateways" (which evolved into the Resource Discovery Network (RDN) and later Intute), but these resources were generally organised into broad subject areas, rather than individual academic disciplines (Law and Dempsey, 2000), which meant that SLs therefore needed to address resource provision at a subject-specific level (Feldmann, 2006; Pinfield, 2001b).

Some JISC-funded VLE projects arguably had a greater impact on e-resource provision. In addition to integrating e-resources, several projects were specifically intended to support the learning and teaching roles of SLs through the use of VLEs (Bonthron et al., 2003; Brown and Currier, 2001; Maccoll, 2001). eLib also had a substantial impact on the development of the teaching and learning support roles of SLs through the national EduLib and NetLinkS training initiatives, which aimed to develop their pedagogical competence and expertise in the educational uses of information and communication technologies in relation to computer-mediated information skills training for the e-environment (Levy, 1997; Powis, 2004). Linking Digital Libraries with VLEs (DiVLE) addressed the inefficiency of VLEs as repositories by using software solutions to create links with library resources (Harris, 2005). The Providing Online Resources to Online Learning Environments (PORTOLE) project enabled SLs to create mini subject gateways providing access to quality resources via the national gateways (Stanley et al., 2004). The Digital Electronic Library Integration within Virtual EnviRonments (DELIVER) project provided tools for course designers to link relevant e-resources managed centrally by the library to learning resources in subject-specific VLEs (Laurillard, 2002; Secker, 2005). The INFORMS and BRUM projects supported the development of repositories to store information skills tutorials authored at particular institutions for re-use by others (Franklin and Stubbings, 2004; Graham and James, 2007).

Factors affecting VLE use

The JISC projects identified the VLE as the main way for academic institutions to reach students with e-learning materials, but this was an intensively-debated area. Thus Bonthron et al. (2003) identify the VLE as the relevant route for accessing learning materials, but others such as Pinfield (2001a) promote library websites as a "channel" for online delivery. UCISA identifies time and finance as key factors impacting VLE use (Jenkins et al., 2005). SCONUL (2004) also identified time as a significant limitation and suggested the outsourcing of VLE developments as a potential solution. However, Stubley (2002) argues that one of the factors driving the delivery of information skills tutorials via VLEs has been limited time in academic schedules for SLs to have contact with students for face-to-face information skills instruction, i.e. time constraints have had a positive impact on VLE use.

Cipkin (2002) and Patalong (2003) both identify a significant need for SLs to receive tailored training for their VLE tutorial role. Powis (2004) describes the provision of teaching courses specifically designed for librarians as "patchy" since the EduLib programme ended, with relevant skills generally learned in the workplace, rather than via courses; however, Bent et al. (2010) report the development of a new online course, SirLearnaLot (based on EduLib), that aims to promote effective teaching, learning and assessment of information literacy in technology-rich environments. Patalong (2003) describes how institutional resources such as help files, online discussion forums and peer support have been used for this purpose.

Some commentators (e.g. Eales and Scantlebury, 2007; Stiles, 2007) argue that Web 2.0 technologies such as RSS feeds, wikis and blogs are key resources that can potentially increase VLE activity by improving the library's ability to reach distance students with timely resources and a wider array of learning approaches. However Roberts and Davey (in Markland, 2003) express more caution at advancing for the sake of using new technologies, arguing that "the development of relationships within the new academic team is the major critical success factor, and not the technological advances, which are simply the tools to make it happen". Nevertheless, several library course-page projects describe current or planned incorporation of Web 2.0 technologies into their resource pages, including RSS feeds and social bookmarking tools (Daly, 2010; Solis and Hampton, 2009). In addition, Dale and Cheshir's (2009) case studies from Bournemouth University report library involvement in using Web 2.0 tools (including social bookmarking and blogs) through the institutional VLE.

Research methodology

An online questionnaire survey was used to gather mainly quantitative data from a selected population of seven UK university libraries. A review of related literature was used to inform the questionnaire design and contextualise the findings, supplemented and updated as necessary to relate the results to current research and practice.

Universities were chosen for the sample on the basis that they had an interesting and varied involvement with VLE projects and practitioners working there would have views to share on their experiences. A purposive sampling strategy was used because it was seen as the best way of collecting the desired data in the short timescale available for the project and a means of allowing comparison between different institutions. Universities involved in VLE projects were identified through the literature and invitations to participate in the study were sent to library/information service heads, who all agreed to take part. Table 1 categorises participating institutions by the period when university status was granted (pre- or post-1992) and the size of their student populations. (Participants were anonymised to comply with institutional research ethics policy.)

Table 1. Characteristics of participating institutions ($n=7$)

Institution	Date established (University status)	Size band (Student population)
A	Post-1992	Medium (11,000–20,000)
B	Pre-1992	Large (21,000–30,000)
C	Pre-1992	Large (21,000–30,000)
D	Post-1992	Large (21,000–30,000)
E	Pre-1992	Medium (11,000–20,000)
F	Pre-1992	Very Large (31,000–40,000)
G	Pre-1992	Medium (11,000–20,000)

Permission was obtained from the service heads to distribute questionnaires to their staff and institutional websites were used to identify SLs at each university. The Survey Monkey tool was chosen as an efficient means of distributing the questionnaire and generating data in a form ready for analysis. It was assumed that all participants would be capable of completing

an online questionnaire. Individual personalised e-mails with a link to the survey and covering letter detailing the ethical procedures of the project were then sent to 132 staff. Respondents were sent reminders at regular intervals leading up to the deadline set by the investigator in order to encourage responses and where appropriate these e-mails were distributed via the head of particular SL departments.

The questionnaire design was based on a review of relevant literature to identify areas that would be valuable to explore. The instrument was piloted on volunteer practitioners who gave feedback on its layout and approach. The majority of the closed questions in the survey were presented as specified responses, asking participants to select relevant categories that were applicable to them, but also enabling them to provide individual responses via text boxes attached to an “other” category. A few open-ended questions were included to add a qualitative dimension to the study, providing an opportunity to gather opinions that otherwise might not have emerged.

The questionnaire was designed around the study objectives. The main areas being addressed were the extent to which SLs were involved with managing e-resources and e-learning in their day-to-day roles; their experiences with the particular VLE that had been adopted by their institution; and the impact of external and internal factors such as eLib, the JISC-funded VLE projects, training schemes, departmental recognition, academic collaboration, or the type of VLE used. The data were assigned codes and themes, using a systematic process of qualitative data analysis, which helped to group related responses together and facilitated the interpretation of the results.

Fifty-seven of the 132 surveys were returned, achieving a response rate of 43% (although some respondents did not answer all the questions). Table 2 shows the distribution of survey participants by institution and the different subject areas that they supported. In the following discussion of the results, individual responses are identified first by the letter assigned to the institution and then by a number; for example, RD4 denotes Respondent 4 at institution D.

Table 2. Subject responsibilities of participants ($n=57$).

Subject area	Institution							Total
	A	B	C	D	E	F	G	
Arts & Humanities	1			2			1	4
Social Sciences	4	1	2	3		1	2	13
Health & Medicine	1		1	1		2	1	6
Physical Sciences			1	1	2	3		7
Cross-disciplinary	6	3	5	8	2	2	1	27
Total	12	4	9	15	4	8	5	57

Results and discussion

VLE activities and roles

Participants were asked to assess the relative importance of specified technology-based competencies for the day-to-day work of SLs on a four-point scale. Figure 1 shows that using VLEs to deliver subject-specific resources was generally viewed as either “very important” or “the most important” technology-based activity.

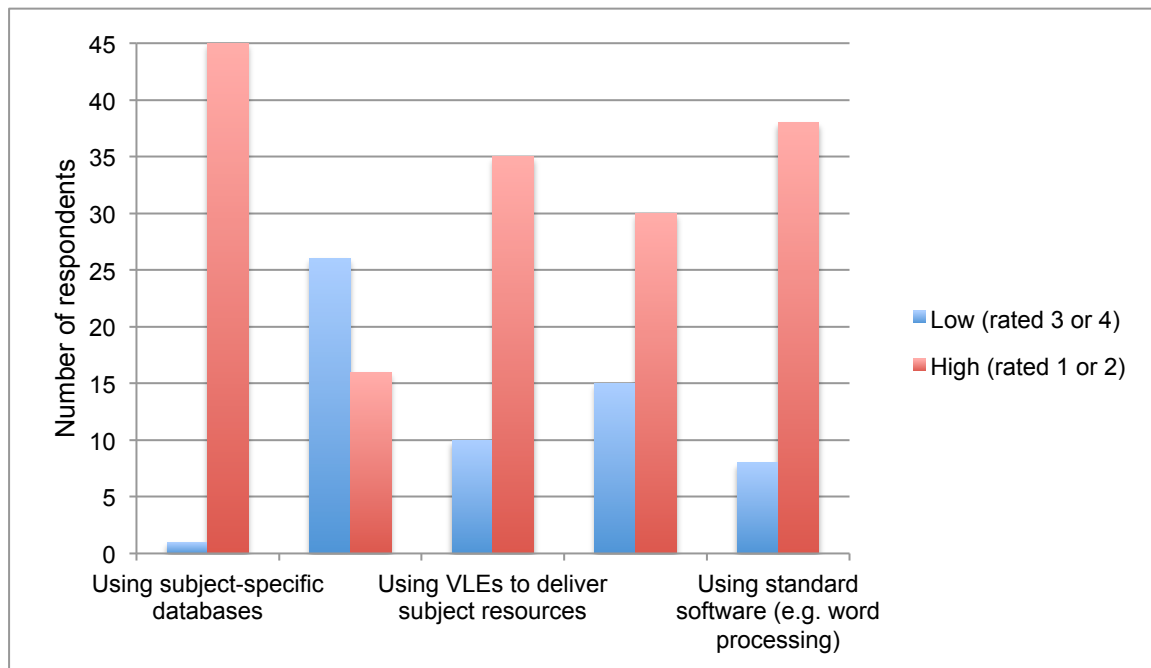


Figure 1. Importance of technology-based competencies ($n=48$).

However, to put this in perspective, while almost three-quarters of the respondents to this question assigned a high ranking to VLE-related activities, that was some way behind the number giving this rating to the use of subject-specific databases, which shows that VLE-related tasks were not yet as well established as this traditional area of SL practice.

Nevertheless, VLE work was seen as more important than website maintenance, which was the lowest ranked of the tasks specified. The other high-scoring technological competence here was using standard software, a rather different type of activity, but useful as a point of comparison indicating the significance of VLEs in the daily work of SLs.

Figure 2 shows the extent to which survey participants fulfilled the VLE-related roles specified.

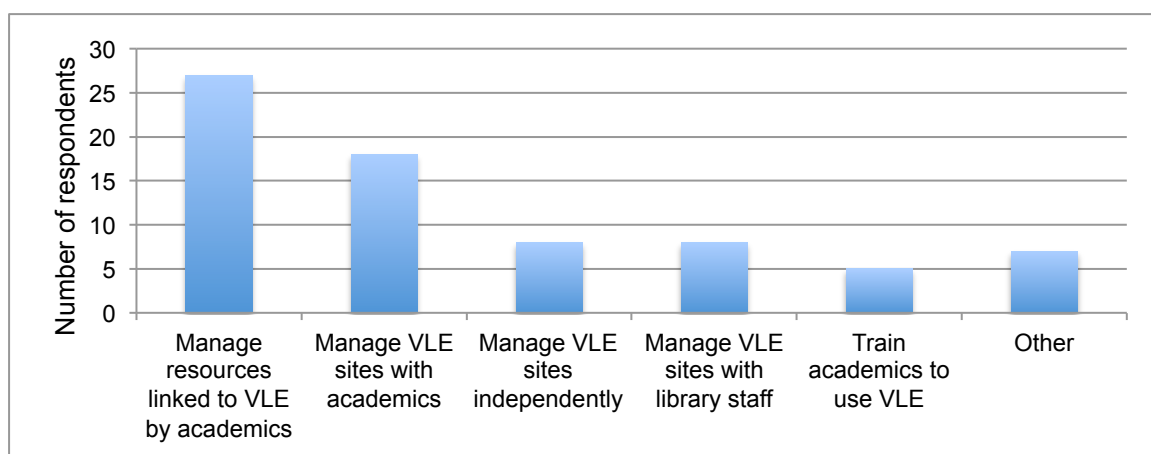


Figure 2. Prevalence of VLE-related roles ($n=48$).

Most respondents (27 of 48 answering this question) indicated that they were involved in VLEs indirectly through maintaining resource lists with software such as Talislist, which were linked to their VLEs by academic staff. However 18 respondents (around one-third of the sample) reported that they had a shared responsibility for managing one or more VLE sites with academics. SLs who commented further individually described a limited role contributing to VLEs that were essentially “owned” by academic staff, indicating how the VLE remains the “domain” of academics, with the library providing access to resources through other systems, for example:

I contribute to academic staff's modules; they are the owners of those modules. Generally the VLE is seen as the domain for [academic] staff and students – the library isn't central to the VLE. The library has developed its own portal, MetaLib (RA4).

Some respondents expressed their frustration about limited library access to their VLE, explaining that they wanted to maintain information skills resources:

In our institution the VLE is a separate dept and we seem to have very little input, except for our systems librarians. I as a subject librarian would like to have access to have input and edit privileges to update guides, video, quizzes and learning skills (RB3).

The perceived academic dominance of VLEs and apparent marginalisation of the library reported here is consistent with many accounts in the literature (e.g. Daly, 2010; Hedges and Secker, 2010; Maccoll, 2001; Markland, 2003; York and Vance, 2009), although others shows that some practitioners have formed strategic alliances that have addressed the issue (e.g. Black, 2008; Dale and Cheshir, 2009; Giles, 2004).

Other VLE-related roles were also described, for example:

[I act as a] mediator between academic staff and e-readings co-ordinators” (RD3).

...past exam papers [are stored] in the VLE” (RD5).

Only a small minority of respondents reported involvement in training academic staff how to use the VLE. One respondent observed:

Subject librarians have an opportunity to help academic staff use the VLE properly; some librarians are doing good things and lecturers would do well to learn from them! (RE4).

Views were divided on how to remedy this missed opportunity. Two respondents stated that SLs need to be more proactive in initiating collaboration, but some felt this responsibility should lie with academic staff. The limited role in providing VLE training to academics confirms the argument by Brophy (2005) and Markland (2003) that academic staff do not turn to SLs for help, even though they are well situated to be using VLEs and offering such support, as noted by Biddiscombe (2002).

VLEs and access to resources

Participants were also asked to indicate how students in their subject areas typically accessed subject-specific resources. Figure 3 shows a mixed picture, with widespread use of separate

library websites and library electronic resource management (ERM) systems rather than VLEs for this purpose, in addition to VLE sites maintained by library or – more often – academic staff.

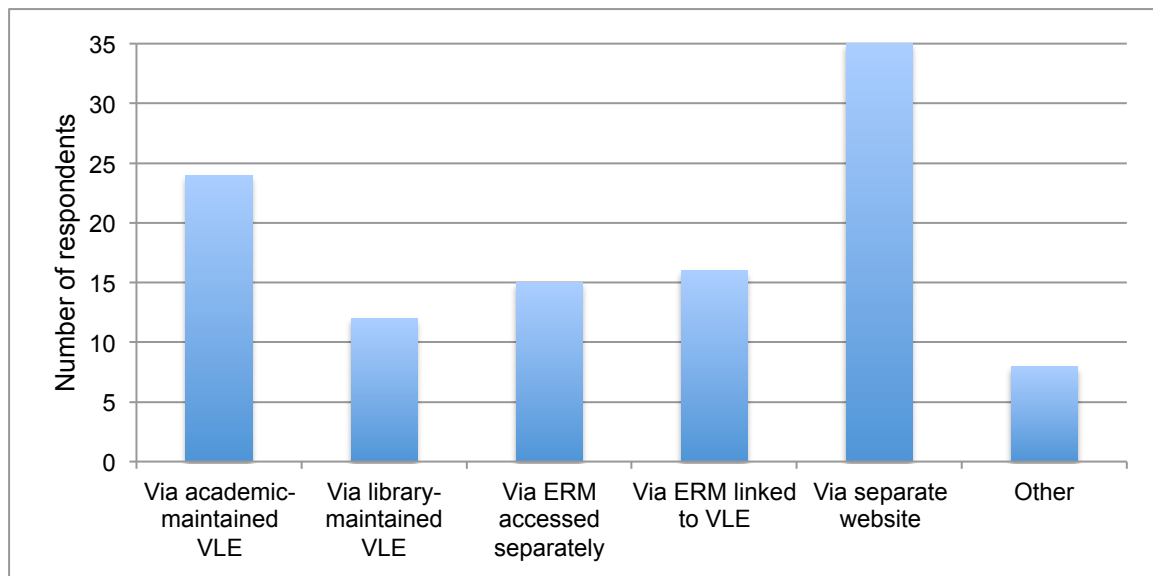


Figure 3. Access to subject-specific resources ($n=50$).

SLs who were making less use of VLEs explained that they created links to online tools, including learning objects and other information skills resources, via separate ERM systems that were integrated into areas of library-maintained websites. For example, one respondent made the following comment:

[I] use the ExLibris systems MetaLib and SFX to distribute learning material, not the VLE (RC9).

The respondents who were distributing material through other channels, including ERM systems, such as MetaLib and SFX, reinforce the argument of Pinfield (2001a) and Rieger et al. (2004) that the library website or portal would continue to be an important access route for students wishing to access their subject-specific resources. The findings here reinforce the notion that in some institutions SLs face barriers in accessing course VLEs that leave them no choice but to use separate websites to deliver their subject-specific materials. However, those who made more use of VLEs in their day-to-day tasks argued the benefits of using VLEs, emphasising that the majority of students expected to find their supporting resources there, particularly students on placements (as shown in the next section) – a view that is in line with current professional opinion that libraries need to present their resources in the places most often visited by students (Daly, 2010; Donaldson, 2010; Kellam et al., 2009).

VLEs and information skills education

Participants were asked about their use of VLEs to provide subject-related support for students. Figure 4 shows that the most common activity selected was linking to electronic resources (21 responses), but there was also substantial use of VLEs for information skills education, with 18 respondents (around one-third of our total sample) reporting involvement in interactive learning activities and eight involved in delivering online courses with formal objectives and assessment.

Respondents were questioned further about how they delivered information skills education and the most common methods selected were subject-specific tutorials and quizzes (18 responses in each case), which feature prominently in published studies (e.g. Black, 2008; Donaldson, 2010; Franklin and Stubbings, 2004; Robertson, 2010; Smale and Regalado, 2009; York and Vance, 2009). Additional comments explained particular circumstances influencing decisions to use VLEs for information skills teaching:

The expansion of students going on placement means that SLs find that [the VLE] is their only or main method of delivering information skills sessions, especially with teaching sessions becoming more packed and lecturers being unwilling to give up their time for face-to-face teaching (RA5).

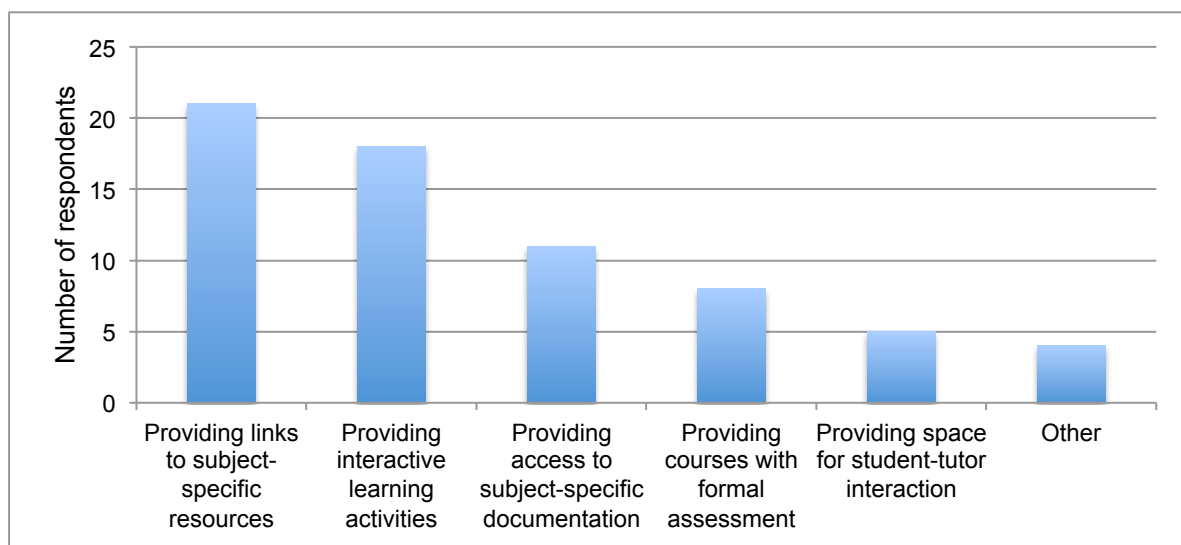


Figure 4. Delivery of information skills ($n=29$).

However, some participants expressed concerns that this type of VLE use was resulting in too little face-to-face contact with students in their subject area. RA9 argued that students preferred to have human contact face-to-face, especially with problems that are IT-related, while RD14 specifically identified mature students as a group with this preference:

Mature students prefer face-to-face delivery of information skills or resources; the main point is they can ask questions and get answers straight away, some questions/answers are very difficult to describe without seeing 'how to' (RD 14).

The widespread use of e-tutorials and quizzes/self-assessment tools is in line with Laurillard's (2002) conversational framework, which highlights the importance of interactivity and feedback. However, the stated preferences for face-to-face teaching reinforce emphasis in the literature on "blended learning", which combines e-learning with face-to-face methods (e.g. Littlejohn, 2005; Secker, 2004). It is pertinent here to note Laurillard's (2002) observation that electronic tutorials were originally intended to complement, rather than replace, face-to-face methods of achieving learning aims and objectives.

Relatively few SLs reported using e-conferencing tools to promote discussion with students in this context. Further comments revealed their perception of this as an area where academic staff would have to be involved for successful implementation. For example, RF2 stated that

being able to work closely with academic staff was the only way to guarantee that learning aims of such activities were “appropriate” and that information skills were “embedded” in modules. These findings confirm the observations of Cipkin (2002) and Markland (2003) that discussion tools are often under-promoted and under-utilised, with students not being sufficiently encouraged to use chat and discussion forum facilities for learning, but contrasts with expert opinion on the subject (e.g. Britain and Liber (1999) see conferencing tools as central to VLEs). However, other evidence from libraries suggests that they may now be making more use of VLE discussion tools (Giles, 2004; York and Vance, 2009), which could be related to other developments, such as the growth in virtual/chat reference services.

When questioned about how they had gained the expertise needed to design and manage learning activities via a VLE, all respondents indicated that they had developed relevant skills through a variety of methods, with the majority reporting a combination of internal training programmes provided by their institutions and working together with colleagues on VLE projects. Several respondents offered individual comments on the use of help files and best-practice articles, in addition to picking up skills from learning technologists and being self-taught. None of the participants mentioned having a technical background, highlighting the importance of the VLE training and support provided. These findings are again consistent with the literature, which suggests that SLs gain the skills for information skills delivery and other VLE roles through a variety of channels, including institutional support systems such as discussion forums, help files, and internal training programs (Cipkin, 2002; Donaldson, 2010; Hughes and King, 2001; Patalong, 2003; York and Vance, 2009). The limited involvement with training programmes outside the institution reinforces Powis’s (2004) argument and Bewick and Corral’s (2010) findings that teaching-related skills in academic libraries are often learned “on the job”.

Impact of JISC-funded projects

Participants were asked to specify outcomes of the JISC-funded projects at their institutions that had made a significant impact on information skills teaching or delivery of subject-specific information resources. This part of the questionnaire was tailored to individual institutions in order to take account of the different types of projects undertaken, as some were particularly concerned with creating access to national networked resources (such as the RDN) and others focused more on the authoring of re-usable learning objects (RLOs).

Respondents generally reported improvements as a result of the JISC VLE projects implemented at their institution. Exceptions tended to be related to particular subject areas, rather than connected with specific projects at individual institutions. For example:

Use of VLEs is patchy, some staff in specific subject areas choose to make use of them more than others (RA6).

RA9 similarly stated that in their subject area (Engineering), skills were more practical and students did not visit the VLE for information skills.

Because of the limitations on the time that staff could devote to VLEs, there were obvious benefits from projects such as BRUM, INFORMS and PORTOLE, which had developed re-usable information literacy learning materials and tools facilitating the discovery and integration of resources into VLE modules. For example, RC5 observed that subject-specific resources in VLEs required more time to maintain and update, but RLOs had “reduced the duplication of effort” and allowed SLs to create materials for unfamiliar subject areas at short

notice. Other specific benefits cited included skills and understanding gained in relation to LO design, experience of interactive teaching methods and improved collaboration with academic staff. For example, when asked how VLE tools had helped their learning support role, one SL commented:

This concept [LO] is fairly new to me, and prior to the new VLE there were not many ways of providing the interaction (RE3).

Another comment shows how the benefits of re-using materials had been recognised:

We need to be there with some quality generic materials that can be grabbed and used... Outsourcing some of the more technical aspects to designing and presenting learning objects (whether in-house or external) can leave subject librarians to focus on content and pedagogy – which seems more appropriate (RF2).

SLs who were making less use of VLEs, had still derived benefits from the projects, reporting that they had created links to LOs and other information skills resources in other ways, for example via separate ERM systems (such as MetaLib), which were then integrated into parts of library-maintained websites. However, those who were able to make more use of VLEs in their day-to-day work saw significant benefits in using this platform, often on the basis noted previously that most students expected to find their resources there.

One respondent stated that after an initial “learning curve” they came to understand some of the options and limitations that VLEs represent, in terms of learning resources and pedagogy, supporting the claims made by Mimirinis and Bhattacharya (2007), who are advocates of e-learning, but assert that it requires a pedagogical approach that is different to traditional teaching, if it is to be effective. Wiley (2000) identifies the sequence and granularity (size) of the LO as crucial in determining the success of online learning, as well as noting that re-usability is key to making e-learning resources affordable. Some participants here also observed that including too much material is likely to put students off using the VLE, also arguing that the presentation of material should make the VLE easy to navigate, which is consistent with Mimirinis and Bhattacharya’s (2007) statement that excessive lists of materials can hinder students’ efforts to understand the learning process.

The majority of participants in the study had thus experienced benefit from being part of a JISC project programme, the exceptions being staff who were new to their role or who were not involved in the relevant areas for various reasons. This finding is not surprising, because the sample population was drawn exclusively from universities actively involved in JISC’s work. However, it is worth noting that overall the types of benefits reported by respondents here are consistent with existing literature on the JISC VLE projects, which identifies the integration of library-managed e-resources of various types with academic VLE sites as central to their aims (Brown and Currier, 2001; Secker 2004).

Different types of VLE

Table 3 shows that the majority of respondents had used one or other of the two leading commercial VLE products, Blackboard and WebCT, and that respondents from institutions A, C, E and F had experience of using more than one brand of VLE.

Several respondents with experience of multiple VLEs stated a preference for Blackboard, on the basis that it was easier and more intuitive to use. Moore and Abson’s (2002) study backs up these positive accounts of Blackboard, describing, for example, how this VLE makes it

easy to create links to databases and to organise online courses into modules. However, others were less enthusiastic. One responded criticised presentational aspects:

Blackboard is clunky and looks old fashioned so many staff and students do not like it or want to use it (RD3).

Another complained about availability:

We are using Blackboard, but it is down quite often (RD14).

Table 3. VLEs experienced by participants ($n=47$).

VLE	Institution							Total
	A	B	C	D	E	F	G	
Web CT	9	4	8	2				23
Blackboard	2		1	12	1	4		20
Bodington						5	3	8
Moodle					4	1		5

Usage of open source VLEs was relatively low among our sample, with only institution E reporting significant use. Only five SLs had used Moodle, but they commented on how intuitive it was, which is in line with findings elsewhere: Eales and Scantlebury (2007) report several benefits in using open source software and comment specifically on how Moodle can be easily modified and how web 2.0 technologies, such as RSS, can be more easily supported. Eight SLs had used Bodington, an in-house institutionally-developed open-source VLE, but one described it as being less user-friendly than Blackboard. The different numbers of users for each type of VLE make it hard to draw fair comparisons and firm conclusions. Two respondents suggested that differences between VLEs were insignificant, once they had become used to how they worked. However, others clearly felt that the type of VLE could have a significant impact.

Other factors affecting use

The UCISA surveys identified finance and time as the main barriers to VLE use across UK institutions (Jenkins et al., 2005) and there was some support for this view in the present study. A few respondents reported that VLE-related tasks required significant investments of time, particularly for ongoing maintenance, for example:

[The VLE] requires a lot of maintenance, so not a 'time-saving' device (RC6).

in the long run, [the creation of subject-specific VLE resources] leads to greater time spent in maintaining and updating modules (RC5).

Respondents also reported that the amount of time needed to maintain resources on VLEs had resulted in too little one-to-one contact with students. However, others saw advantages in VLE-based delivery, with contrasting views expressed at the same institution:

It enables us to be flexible in our approach to skills delivery and reach many more students than in our face to face training (RC7).

Several respondents thus recognised that VLEs could actually extend contact with students, particularly (as noted earlier) those on placements and studying at a distance, also arguing the need for SLs to get involved in order to create a single access point to subject-specific resources for students, as discussed before. Some participants were therefore leaning more towards Stubley's (2002) view that limited time for face-to-face instruction is a key driver of online delivery via the VLE.

When asked which technical developments they expected to have the most impact in the near future, a few SLs saw opportunities to improve VLE delivery with Web 2.0 technologies. For example:

The use of Web 2.0 – blogs and wikis may prove to be of more relevance and immediacy for students in the near future (although not within the university's control) and [we need to] develop it so it can be delivered via the VLE and make the VLE material more relevant and accessible (RD3).

This reinforces the positive views put forward by Eales and Scantlebury (2007) and Stiles (2007), who see the use of RSS, blogging, and wikis as highly relevant to the future of online learning environments. Recent literature confirms that librarians are now incorporating Web 2.0 tools in their VLE activities, using them to enhance resource pages and information literacy development (Dale and Cheshir, 2009; Daly, 2010; Solis and Hampton, 2009).

Research limitations

The survey questionnaire method was chosen because of the relatively small timeframe (three months) available to gather data and similarly the mainly quantitative approach was adopted to minimise the time required by participants and encourage responses from a population known to have many commitments. This inevitably limited the detail and depth in the responses to a level below that which might have been achieved through research interviews. Responses to the qualitative open-ended questions varied significantly in length, which limited the scope for comparative analysis. However, an interview-based study could not have covered such a large population, unless conducted over a much longer period or with more researchers. Moreover, the mixed methodology of the questionnaire enabled the investigation both to establish broad trends and patterns of activity in VLE use and also to explore, within the limitations stated, factors impacting and issues surrounding such use, including in some cases the reasons for different responses within the same institution.

Conclusions

Despite the limitations identified, this study has been able to establish some key findings in relation to the use of VLEs by subject librarians. First, despite the assumption that institution-wide adoption of VLEs should involve academic libraries and SLs, this is evidently not the universal situation. One factor that appears to have a bearing on this is that some subject areas seem to have less need for or interest in a VLE than others, although our investigation did not establish definitively which subjects were better suited to or at least more inclined towards VLE use. Another key factor affecting library participation was the extent to which academic staff recognised the SL's role in relation to the VLE and whether they allowed access and permission to update materials. The individual SL's response to technology-driven change also has a significant impact, as some clearly prefer the face-to-face approach for delivering information skills. The JISC programme of VLE projects was shown to be a significant positive influence facilitating the development of learning resources and

pedagogical understanding. Differences between VLE brands such as Blackboard, WebCT, Moodle and Bodington, seemed to have relatively little influence on the use of VLEs by SLs.

Other areas examined by this study included staff training and development related to VLEs and the extent to which VLEs were perceived as a time-consuming or time-saving development. The majority of SL participants gained most of their VLE-related skills through institution-provided training and by working together with other colleagues, with relatively little use of external training provision, which confirmed the picture described in the literature. Although some respondents commented on the time taken up by maintaining VLE resources, others acknowledged the cost-effectiveness and efficiency gains represented by using VLEs to reach more students and by re-using learning objects to create teaching materials for different subject areas with reduced effort. Looking ahead to future developments, Web 2.0 technologies such as RSS feed, blogs and wikis, were identified as having the potential to make VLE resources more relevant and accessible to students.

Finally, this study has thrown further light on the contentious issue of the teaching role of subject librarians in revealing many instances of their potential contribution not being properly recognised and showing how this can restrict their access to VLEs and hence their ability to undertake VLE-related tasks. Literature published since the survey was undertaken shows that gaining access to VLE course sites has continued to be problematic in the UK and North America, although some librarians have resolved this issue, with help from VLE administrators and other stakeholders. It would be useful to carry out a similar survey of academic staff who “own” VLE sites to investigate their perspectives on the issues surfaced in this study and test their reactions to the idea of creating an official Librarian role within VLEs, distinct from Course Builder and Instructor, as trialled in the US. A more in-depth investigation than the present study could also explore further how LOs and tutorials are being authored, which subject areas are more suited to VLEs, and how institutions and their libraries are dealing with limitations in the time and financial resources that they can commit to VLEs.

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