

# Are digital library resources useful for learners and researchers?

*Updated from a paper presented at the 25th UKSG Conference, Warwick, April 2002*

The UK is in many ways ahead of the game in providing access to electronic information in its colleges and universities. But this is no reason to be complacent! Mounting evidence suggests that many students and staff members are having great difficulty finding and accessing the wealth of high-quality published materials available online, and that digital library resources are not yet well integrated with the learning and research systems that are increasingly used. Librarians and publishers will need to work together, and both will need closer working relationships in future with lecturers and researchers.



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*Alicia had an important delivery date to keep to in the autumn so we delayed publication of her article until the spring*

## **Introduction**

Colleges and universities around the world are experiencing rapid change in the use of information technology in learning and research. There are many drivers for this change. Some of the drivers are political. In Europe, for example, governments put a great deal of emphasis on distance learning, lifelong learning, and widening participation in learning. Other drivers are technological. Institutions are investing in instructional management systems, teachers are putting their courses online, and a growing number of students gain part of their education through virtual learning environments. Other drivers are financial. An ever-growing and more diverse student population is generally accompanied not by generous new funding lines, but by clear demands for efficiency gains from funders and better services from fee payers. It is a challenging time to be in the business of further and higher education.

It is also a challenging time to be an information service provider in a college or university. Along with the pressures already outlined are opportunities to work in new ways with learning and research colleagues – but the rub is that those colleagues may not appreciate the relevance of the knowledge and skills of information professionals.

There are some hopeful signs that collaboration is possible. For example, scholars and information professionals worldwide are acting decisively to regain some control over scholarly communications. An increasing number of teaching teams now also include representatives from library and information services.

There are also some signs that suggest challenges remain. Researchers, especially in the physical and life sciences, demand new tools to cope creatively with the massive amounts of data now produced. These demands resonate with governments and a growing number of them invest substantial sums in developing Grid tools to support e-science. Many senior information service providers are now actively engaging with the Grid community to advocate that shared tools and a single shared infrastructure would be desirable. Sometimes the problems shared by the digital library and e-science communities can go unrecognised as each community has its own culture for discussing and dealing with challenging technical issues.

The key technical challenge for librarians and publishers is simple: how is your content going to be serviced in new e-learning and e-science

environments? If your content is not integrated into the new virtual learning and Grid tools with which they are working, will students and staff members continue to navigate their way to your services?

### Some information about user behaviour

Sit back for a moment. Imagine a user of online information and what their information-gathering experience might be like. Many visions are possible, but the one that occurred first to me is of an excited web surfer discovering lots of useful stuff with a quick, simple, free search engine. The evidence, however, is mounting to suggest that reality is much more complex and rather less rosy.

An evaluation and monitoring framework (Rowley, 2000 and 2001) for student and staff use of 'educational information systems' has been carried out in the UK for the last three years. The framework has several parts, but key for the UKSG audience are two projects. One is called 'JISC Usage Surveys: Trends in Electronic Information (JUSTEIS)', and is conducted at the Department of Information and Library Studies at the University of Wales, Aberystwyth. It is an annual survey to measure and evaluate the overall awareness, uptake, usage and usefulness of information technologies and information services in higher education. The second is called 'JISC User Behaviour in Information Seeking: Longitudinal Evaluation of Education Information Systems (JUBILEE)'; this is a linked programme involving ongoing, longitudinal monitoring of the information behaviour, needs and opportunities of academics and students.

The evidence from this framework suggests that using online information is actually a pretty daunting task, and that high-quality information resources are relatively under-used. Users in UK colleges and universities typically do begin their hunt for information with free search engines. Unfortunately, many of them stop there (see Table 1). What this means is that librarians and publishers are spending a lot of time, money and energy providing access to content that is relevant to learning, teaching and research activities, but it is not being used by many in the intended audience.

The evaluation and monitoring framework has produced a number of compelling quotes from those interviewed about their actual experiences of searching for high-quality academic information. The following scenario is pieced together from some of their experiences. Does it resonate with your experiences?

*A third-year undergraduate is asked to do a research paper on a new cancer drug, and it is suggested that BIDS and Medline are good starting places. The student is logged on when she receives this assignment, but cannot immediately use resources in either BIDS or Medline because relevant information from those services is not embedded in her university's learning environment. Instead, she logs off the virtual learning environment, navigates to her university's library OPAC, searches the OPAC, then navigates first to BIDS and then to Medline. Although she searches both resources, she finds nothing. Feeling desperate she goes to her tutor for advice, and is directed to use the paper copy of Chemical Abstracts in the library. This proves a little too challenging to use, so she gives up and goes in search of a friendly librarian. Unfortunately, it is the*

Source	Undergraduates N = 300	Postgraduates N = 178	Academics N = 87
Search engines	77%	76%	53%
BIDS, etc	11%	10%	37%
Local OPAC	29%	21%	37%
<b>E-journals</b>	<b>5%</b>	<b>3%</b>	<b>34%</b>
Local cd-roms	18%	18%	23%
Web databases	12%	13%	15%
Subject gateways	0%	0%	9%

Table 1: Figures are from the JISC's User Behaviour Monitoring and Evaluation Framework, First Annual Report, August 2000. There is, however, some evidence of an upward trend by the Third Annual Report, July 2002.

*subject librarian's lunch hour, so she goes back to her hall of residence and writes a letter to the drug company asking them to send her the relevant information in the post.*

One could argue that the solution lies with users: investment is needed to improve their information literacy skills; inducement is needed to motivate them to do more thorough searches. It is also fair to argue that some of the solution lies with service suppliers, as there are many barriers to discovery, access, and use of digital library resources that defeat even motivated and skilled users.

We, as information professionals, currently provide information in an environment that is challenging for users. To find information, we expect users to navigate numerous opaque sources. Some are printed, some are online, others are living. When online, resources are hidden behind different interfaces and navigation or search mechanisms: some free, some paid for, some authenticated, some not. Each resource has a different structure, and using each resource involves climbing an associated learning curve. Users may not discover the best resources anyway, because many high-quality resources are not adequately indexed on general search engines.

Most resources stand alone on the web, competing with each other for users' eye time and brain space. Only a limited number of these will be successful. All the information from the JISC's evaluation and monitoring framework suggests that the winners will be either free search engines or systems that staff and students are obligated to use. Staff and students are not obliged to use publishers' systems or library systems, even the OPAC. They are obliged to use institutional portals, virtual learning environments, or e-science grids.

Again, the key challenge for librarians and publishers is simple: how is your content going to surface in the resources that staff and students will use?

### **Tailoring the web to support learning, teaching, and research**

JISC is funding a number of exciting development projects in UK colleges and universities that are intended to tailor the web to support learning, teaching, and research. Interestingly, these projects have resulted from different JISC funding initiatives over the last few years championed by

the e-learning, e-library, or e-science communities. JISC committees and officers are now working toward an integrated development strategy that can harness these initiatives together to best unleash their power and ensure their interoperability.

The projects are now under way and will produce reports, content, software, services, and tools over the next three years (JISC, 2002). Many are informed by a single architecture that is intended to make all kinds of content easier to find and use (Powell and Lyon, 2001) and that is relevant to publishers (Baldwin, 2002). Key objectives for this work are to:

- a) Develop a shared middleware infrastructure and other online services, based on standards, which enable users to identify the information they need and to access it easily, safely, and in a consistent manner. Content and applications of importance to learning, teaching, and research will require a single, shared, invisible middleware infrastructure, and will continue to be delivered via a single shared network.
- b) Ensure that the infrastructure is not of use only to UK further and higher education, and that it can work well for other publicly-funded initiatives and, through them, assist the creation of a unified resource base to support the operation of a learning society throughout the UK (DNER Vision Statement, 1999).
- c) Shape environments designed to deliver all types of content and applications. This means journals and books plus images, videos, sound, databases, maps, learning materials (JISC Collections Development Policy, 2001). It also includes the wider variety of resources of interest to the e-science community (e.g. computational platforms, models, remote sensors).
- d) Tailor knowledge. Personalisation is one feature of good tailoring, so knowledge environments will require facilities for individualised and subject-based presentation of resources.
- e) Be 'content agnostic'. It cannot matter where the content is from, if it is of high quality. Sources of content will continue to include publishers, aggregators, e-print archives, etc.
- f) Ensure that content created for one purpose must be capable of being repurposed.

Automated tools and new standards will be required to support this requirement.

- g) Adhere to international standards. Knowledge environments can only be shared and extended if their building blocks are compatible.
- h) Be distributed. Systems designed on absolute centralisation of content do not scale. We need intelligent tools to manage distributed content while presenting a seamless search experience for users.

### Conclusion

The situation is not bleak, but neither is it time for complacency. Staff and students in UK colleges and universities are using online books and journals available to them through their digital library services, and there appears to be a gentle upwards trend in use. This gentle upwards trend is quite subtle, which is in marked contrast to the graphs showing the rise in prices for digital library resources. More attention to ensuring that users can easily access content, and benefit demonstrably from this access, is warranted from both librarians and publishers, if for no other reason than to justify the amount of public money invested in providing online content.

A concerted effort is also required to develop mechanisms for embedding digital library resources in e-learning and e-science environments. For e-learning, there is a key suite of standards developed under the IMS umbrella. Without IMS, it is virtually impossible that digital library resources will be embedded or retrievable through virtual learning environments. So, if you would like staff and students to find and use your journals or books easily, IMS is a standard you should explore in greater depth. The second annual PALS conference will focus on new learning environments and the challenges of embedding digital library resources in them. This

event will take place on June 27, 2003, and IMS will be a key issue addressed on the programme.

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