International Library Cooperation Symposium

Digital Academic Content and the Future of Libraries: International Cooperation in a Networked Age.

Ingrid Parent
University Librarian
University of British Columbia

May 14, 2010

Outline

Introduction
General trends
- Information seeking in a Google world
- Open content
- Technological impacts on teaching and research
- Public access policies

Implication for academic libraries
- Dissemination of university research
- E-research
- Learning commons
- Information literacy
- Advocacy

Enhancing the value of academic libraries through collaboration

Introduction

The university library has always been a focal point of university life: A place for students and faculty to do their research and advance their knowledge.

Over the last decade, digital technologies have revolutionized the way libraries provide access to information and also how users seek information.

Most major journal publishers now provide their entire portfolio in digital format and the transition by libraries from printed journal holdings to electronic journals has been rapid.

Scholarly book publishers increasingly publish both print and electronic versions of their books and in the last year or so we have seen a dramatic upswing in consumer acceptance of e-books. If we also include the huge amounts of research materials being made available online by digitization initiatives- like through the Google book project- the vast scale of rich information resource available to students and scholars is staggering.

The sheer volume of information that can be searched, browsed and printed from the convenience of a library user's desktop machine is now almost unimaginable. And users can access it all without stepping into the library building.

Despite these huge strides in the provision of and access to information by

academic libraries, they are struggling to keep their place as a major source of inquiry. Indeed, the monopoly academic libraries once had as the sole access point to information has been greatly eroded.

In this rapidly evolving digital environment, libraries must reposition themselves in terms of resources, operations, services, and skills.

General Trends

Today I want to talk about some general trends with research and education and the implications of these trends for academic library services.

Information seeking in a Google world

The first trend involves the way people find information

We are entering an era of ubiquitous information, with powerful search engines, wireless connectivity, online communities, and handheld devices.

Our students- many of them ‘digital natives’ who grew up with the internet- are at ease with online, collaborative technologies. Whereas a notebook and pen were the school supplies of prior generations, today’s students come to class armed with smart phones, laptops and iPods.

Information seeking is being fundamentally changed by previously unimaginable 24/7 access to scholarly material and hugely powerful search engines.

Academic libraries, with their somewhat “clunky” interfaces, cannot compete. Although libraries offer an enormous range of valuable publisher content to users, library systems are far less intuitive than the ubiquitous search engines. As a result, users are more comfortable using search engines than library catalogues.

We know that researchers and students do not use the range of resources made available through the library and tend to use the same small set of information resources no matter what question they have. It is questionable therefore whether our users get the “right” information or “enough” information to truly meet their research needs.

(Sources: University of Washington Information School. Project Information Literacy: A large-scale study about early adults and their research habits. http://projectinfolit.org/- Google and the Google Generation; OCLC Review)

Open Content

There is a strong trend towards the re-use and repurposing of information.

Its foundation comes from the idea that equitable access to high-quality education and research resources is a global imperative. Over the last decade there has been much discussion about the merits of open standards, open source software, open access to scholarly publications, and most recently open data.

The “Open content” movement has evolved out of this perspective. It is rooted in the idea that users don't just want to find information, they want to reuse it, manipulate it, and repackage it to meet their individual needs.

Creative Commons and other open content licenses have been developed to enable users to reuse content. These licenses are becoming more widely used across sectors, including some scholarly publishers such as BioMed Central, Public Library of Science, and Hindawi Publishing.

In addition, open data initiatives argue that research data should be part of the public domain and not be restricted by copyright or license. Access to, or re-use of, the data can be controlled through access restrictions, licenses, copyright, patents and charges for access or re-use. Advocates of Open Data argue that these restrictions are against the communal good.

And similarly, there has also been a lot of momentum for open educational resources. This content is made free to use or share, and in some cases, to change and share again, through the use of open licenses. MIT in the US has been a leader in this area and has made the university’s entire curriculum, over 1,800 courses in 33 academic disciplines, freely available online.

Impacts of technology on teaching and research

Another important trend involves the impacts of technology on research and teaching.

“E-Science, e-research, cyber infrastructure”- these are the concepts at the heart of research in the new century.

Scholarly practices across a wide range of disciplines have been profoundly changed by the application of advanced information technology.

This trend, which is broadly referred to as “E-research”, has been characterized as “the systematic development of research methods that exploit advanced computational thinking” (Professor Malcolm Atkinson, e-Science Envoy).

e-Research involves the use of computer-enabled methods to achieve new, better, faster or more efficient research and innovation in any discipline.

Similarly, for education, technologies are having an irrevocable impact on teaching and learning at the university.

Technology is enabling multi-modal teaching, changing curricula, interdisciplinary studies and spawning rich forms of online collaboration.

According to an international 2008 survey published by the Economist, online-collaboration tools, software that supports individually paced learning, and learning-management systems are among the communications technologies most expected to improve academics over the next five years.

(http://www.nmc.net/pdf/Future-of-Higher-Ed-(NMC).pdf)

In addition, online learning and distance education is gaining a firm foothold in universities around the world. Many universities offer online courses and consider online learning key to advancing their mission.

Public access policies

The last trend I want to highlight is the growing number of Public Access Policies being implemented in the research community.

According to ROARMAP, a UK service that monitors these types of policies, there are now over 100 such policies at funding agencies, universities or research centres worldwide.
(http://www.eprints.org/openaccess/policysignup/)

Driving these public access policies is the perspective that most university-based research is publicly funded, and therefore the public should have free access to the results.

Generally, these policies require that authors make their articles freely available to anyone over the internet within a certain period of time after they have been published.

Public access policies are most common in health sciences. For example, one of the most wide reaching policies is the one implemented by the National Institutes of Health in the US. The NIH annually invests over $28 billion in medical research through almost 50,000 competitive grants to more than 325,000 researchers. The policy requires that all NIH funded researchers make their papers freely available through PubMedCentral, a full text repository of biomedical literature.

Similarly, the Canadian Institute for Health Research (CIHR), the only granting council to do so, requires that all its funded research be deposited in an open access repository within a year of its publication, provided that the publisher agrees. In most cases, this works well.

Universities have also begun to implement open access policies- for example Harvard, Stanford, MIT and others. In the case of universities, policies usually require that authors deposit their content into the university repository. However, while many universities have repositories, experience so far has shown that deposit rates by authors are low if they are not accompanied by a university policy.

So, how can libraries remain relevant in an environment where they are no longer the prominent access point for access to information?

Academic libraries must begin to redefine themselves, by developing services that position them at the centre of this complex and evolving landscape.

I would like to highlight some examples of how libraries are already doing this and should continue to do so:

Dissemination of university research outputs

In a recent report on university publishing, the Association of Research Libraries posed the question, “To what extent should the institutions that

support the creation of scholarship and research take responsibility for its dissemination as well?”

Universities are re-evaluating their role in regards to the dissemination of their research output. Similarly, academic libraries are rapidly moving away from the role of acquiring publications and other material in support of research to becoming active contributors to knowledge production and dissemination. Librarians are moving away from a traditional custodial role to one of being an intermediary or moderator to not only find information but to interpret it.

Clifford Lynch, Executive Director of the Coalition for Networked Information contends that the shift to digital technologies “demands that universities take on a much more active role in ensuring dissemination of the knowledge produced by their institutions – both now and in the future”.

(http://www.arl.org/news/pr/universities-12feb09.shtml)

Libraries, by providing support for digital repositories, university publishing, and digitization programs, are central for universities wanting to strengthen their role in disseminating research.

Digital repositories

Electronic theses and dissertation repositories are becoming ubiquitous and many academic libraries have set up institutional repositories to provide open access to the journal articles written by faculty.

The huge increase in the amount of research data being produced has given way to a growing demand for libraries to expand their repository activities to include data.

To date, most university repositories have struggled to attract content. However, as universities take on greater responsibility for disseminating their research outputs, it is expected that the relevance of library repositories will grow.

Example of repositories:
Australian Repositories Online: http://research.nla.gov.au/
Digital Repositories Federation Japan: http://drf.lib.hokudai.ac.jp/drf/index.php?Digital%20Repository%20Federation%20%28in%20English%29

Publishing programs

University libraries are also becoming more involved in supporting the digital publishing activities of their faculty members. In Canada, for instance,

almost all of the large academic libraries are hosting journal publications, and some are also looking at supporting monograph publishing as well.

Libraries have been able to enter into these activities with the advent of publishing management software, like the “Open Journals System”. These systems manage the journal’s workflow from manuscript submission to publication and make it significantly easier and less expensive to publish.

Library digital publishing services will typically include hosting the journal, and providing technical assistance and training in the use of the journal publishing software to editors.

The University of California has one of the most well-established publishing support programs run by a university library. (http://escholarship.org/publish_overview.html)

Their eScholarship program supports the publication of open access journals, books, working papers, conference proceedings, and seminar series. Library staff work with editors to establish the look of the journal, while all editorial activities are the responsibility of the participating academic unit or publishing program.

Digitization

Library digitization projects could also be considered as part of a university’s mandate to more broadly disseminate their research assets.

Many academic libraries are digitizing portions of their rare and/or out of copyright materials and making these materials freely available on their website or through aggregators.

Several libraries in North America and Europe have been involved in the Google Book program, which is digitizing and making available millions of out-of-copyright books, as well as providing snippets of information from in-copyright books.

Some libraries are also implementing fee-based digitization and print on demand services.

McMasters University in Canada, for example, owns a robotic book scanner and has begun a program to digitize out-of-copyright books in the collection. As books are digitized, records for the electronic version will be added to the library catalogue, integrating them with the full collection of print and electronic resources available through the library. The books are available to the McMaster University Community, and can be downloaded for a fee by others via a commercial book seller (Kirtas). The library's digitization services are also complemented by a print on demand service being offered by the campus bookstore. The bookstore owns an Espresso Book Machine which prints digital books quickly and inexpensively from a digital file. http://digitalcommons.mcmaster.ca/mcmastercollection/

Digital preservation

Along with these burgeoning dissemination activities, comes the need for preservation.

Preservation has long been considered a fundamental responsibility of academic libraries. However, digital preservation poses serious challenges for libraries.

Digital content is very fragile and can be easily lost through hardware degradation, software obsolescence, or simply a lack of capacity and resources to capture the growing volume of digital information.

Libraries and others have been slow to develop the full range of services needed to ensure ongoing access to digital resources because of the costs and complexity of tasks involved, as well as devoting attention to other digital priorities.

However, clearly we must improve our capacities to do so if we are to expand our role in terms of managing the universities digital research output.

E-research

A number of libraries are testing the waters in terms of their role in supporting e-research.

Academic libraries have traditionally supported research by selecting, organizing, and making text-based materials available for research purposes.

However, data is the major currency of e-research, not text.

According to Tony Hey, former Director of the e-Science Core programme in the UK, over the next 5 years, e-science will produce more scientific data than has been collected in the whole of human history.
http://www.rcuk.ac.uk/escience/default.htm

Data curation

Data curation is the most commonly discussed role for libraries in terms of e-research support. Data curation refers to the active and on-going management of data through its lifecycle. It involves the selection of data, creating metadata for discovery, creating documentation related to data; and offering preservation services.

Although there are some disciplines that are well served in terms of data curation- like genomics and astronomy- these disciplines are in the minority and there are severe gaps in data management infrastructure and services in many domains.

In *No Brief Candle,* Rick Luce, director of Emory University, recommends that initially, research libraries could best contribute by assisting with the preservation of smaller-scale data sets that arise from the work of local or domain-specific research groups. This data tends to be somewhat

unorganized, disparate and heterogeneous.

This is what they are trying to do at the Digital Data Curation Center at Purdue University in the US.
http://d2c2.lib.purdue.edu/

The aim of the centre is to address curation issues and work on problems related to unorganized, disparate, heterogeneous and distributed data, data workflow and environments.

The majority of projects involve working in partnership with domain scientists and information technologists to address the data needs of a specific research community.

In Canada the Canadian Association of Research Libraries has published, both online and in print, a guide called Research Data: Unseen Opportunites which assists academic libraries in managing data through its life-cycle.
http://www.carl-abrc.ca/about/working_groups/pdf/data_mgt_toolkit.pdf

Data training for researchers

There is growing evidence that researchers worldwide need to have access to training resources in the area of of data management as well. A recent UK survey, for example, found that “although there are disciplinary variances, data management competence of researchers is generally poor” (Mind the Gap, Liz Lyon)

Researchers need advice concerning data management plans, technical standards, data cataloguing, metadata standards and processes, and preservation management.

Academic libraries could assist the research community by providing access to training resources.

MIT Libraries, for example, is trying to address knowledge gaps by publishing a website explaining to researchers how to manage their data. http://libraries.mit.edu/guides/subjects/data-management/index.html

The website is very comprehensive. Among other things, it contains sections on metadata, data documentation. It contains a "Data Management Checklist" and offers advice for developing data management plans.

Virtual research environments

Libraries can also support e-research by developing and hosting Virtual Research Environments or "VREs".

VREs provide a framework of resources- such as datasets, analytical tools, publications, and so forth- in support of research.

VREs have the potential to benefit research in all disciplines at all stages of research. By providing access to data, tools, computational resources and

collaborators, VREs lead to faster research results and novel research directions.

A landscape study of VREs undertaken by the Joint information Systems Committee (JISC) asserts that libraries can be instrumental in the development of VREs given their existing role in data and resource management.
(http://www.jisc.ac.uk/publications/reports/2010/vrelandscapestudy.aspx)

One of the most difficult challenges faced by VREs is their sustainability. VREs are often built with research funds and lose their funding at the end of the research project. In addition, VREs often cut across institutional and national borders making it difficult to find appropriate funding. Academic libraries could play an important role in ensuring their sustainability.

The University of Prince Edward Island Library in Canada has developed open source VRE software, called Islandora that can be downloaded and used by libraries (and others).
Islandora: Virtual Research Environment at University of Prince Edward Island
http://islandora.ca/

At UPEI they are using the software to support research and the library has set up 16 VRE communities: http://islandora.ca/VREsites

One example is the Marine Natural Products Group (http://upeikerrlab.ca/). The VRE contains data, images and analytical tools that enable researchers to document and share information discovered through their research.

Learning Commons

New educational technologies are having the impact of moving higher education away from a teaching culture, toward a culture of learning. In a learning culture the focus is on helping students become independent learners rather than on the passive transfer of information from teachers to students.

The Learning Commons concept has evolved out of the thinking that libraries can create dynamic and collaborative environments that foster the culture of learning in new and creative ways.

The 'Learning Commons' is not a static computer lab, but rather, it incorporates wireless communication and flexible workspace clusters that promote interaction and collaboration. It combines individual and group study space, new technologies, reference services, and instruction from librarians and other information technology staff.

One example of a learning commons can be found at the University of Victoria in Australia: http://w2.vu.edu.au/library/LearningCommons/

They have developed a new service model that extends beyond the administrative boundaries of the library. The learning commons is physically

housed in the library, but services are provided by several other campus partners as well as the library: Information Technology, Student Careers, and Teaching & Learning Support.

They have also included a peer mentoring service called Student Rover Program to improve engagement with students. Student Rovers provide on the ground support to students and also assist them through referrals to more experienced discipline specialists.

The Learning Commons at the University of Victoria has proven to be very popular. “The addition of learning and career support services and friendly student rovers has made it the number one choice for students to learn and study together. At peak times the space is at capacity and there has been a strong demand for longer opening hours.”

The University of British Columbia, through its Irving K. Barber Learning Centre, takes the concept of a Learning Commons one step further by also incorporating outreach activities to communities, both near and far, within British Columbia. These activities include digitizing local archives and smaller collections, as well as partnering with faculties on campus, to take academic research guides, such as in the Business faculty, and “translating” them for use by non-academic users such as small businesses.
http://clc.library.ubc.ca/

Information Literacy

In the digital world, academic libraries are expanding their work in the area of information literacy.

The library profession has long worked to promote the knowledge and skills required to be effective consumers of information.

As the sheer volume of information and the methods of accessing, organizing, and utilizing it continue to increase, the skills necessary to find and use that information are also increasing in complexity.

User studies have consistently found that information literacy is not improving with widening access to technology.

A global study of library users perceptions of library and information resources confirms this. The study, conducted for OCLC, found that the vast majority of college students use search engines to begin an information search, while only 2 percent start from a library web site. They also found that despite massive investment in digital resources by academic libraries, students still associate libraries mainly with print books.

(Perceptions of Libraries and Information Resources, 2005)

Meanwhile, digital literacy is cited as one of the most important professional skills that employers are looking for in potential employees.

Training in information literacy is a role that is unique to libraries and is increasingly relevant in the digital environment.

Students need the skills to help to find information, select and assess information. They need knowledge of copyright and increasingly they need to be trained in the use of new technologies.

For example:
University of New England Library (in Australia) Library has a very comprehensive program addressing information literacy.

eSKILLS UNE
(http://www.une.edu.au/library/eskillsune/)

eSKILLS UNE was launched in early 2001. The core content is strongest in library skills areas of information literacy. The suite links extensively to content elsewhere in order to provide a single point of access for those needing to build information literacy knowledge and skills.

The website provides instruction for each stage of a research project: Assessing the project, finding information, selecting and sorting information, putting it together, keeping track, and using information appropriately.

Advocacy

Academic libraries have an interest in promoting laws and policies that foster global access and fair use of information for research, teaching and learning.

Intellectual freedom is one of the most closely held core values of librarianship and academic librarians have long championed the cause of intellectual freedom on their campuses.

Academic libraries have also becoming increasingly active in promoting fair copyright and open access policies.

Copyright laws in many countries are undergoing major changes in response to the digital environment. These laws could potentially have substantial impacts on the nature and extent of information services libraries provide to their users.

Libraries and library associations represent the users perspective and can work to ensure that countries implement balanced copyright regimes and counteract the strong lobby for more restrictive copyright laws.

The Library Copyright Alliance is a good example of this. (http://www.librarycopyrightalliance.org/)

The Library Copyright Alliance consists of three major library associations — the American Library Association, the Association of Research Libraries, and the Association of College and Research Libraries.

The purpose of the Alliance is to work toward a unified voice and common strategy for the library community in responding to and developing proposals to amend national and international copyright law and policy for the digital environment. The LCA's mission is to foster global access and fair use of information for creativity, research, and education.

At the international level, IFLA, the International Federation of Library Associations and Institutions, has excelled in the area of advocacy for equitable access to information through its Copyright and other Legal Matters committee (CLM). It is having a major impact in discussions with WIPO and other international legal committees.
http://www.ifla.org/clm

Open access is another area where libraries have already made great strides in terms of effective advocacy. Library associations, as well as organizations like SPARC, SPARC Japan and SPARC Europe, have been very effective in raising the visibility of the issue of open access and the articulating the benefits that will be accrued.

Challenges

So, as you see, there are numerous opportunities for academic libraries to develop creative and useful services in the digital environment, and to take back a leading role in providing information to users.

It is worth mentioning that there are some inherent challenges for libraries in implementing these types of new services.

Developing expertise will not always be easy for the library community. Many of the new roles- like managing digital repositories, digital publishing, or supporting e-research, for example- require a high level of comfort in the digital domain. These types of services demand new competencies in the areas of digital preservation, metadata, formats, standards, and access and legal considerations.

In addition, many of these new services are not be a good fit with the existing organizational models of academic libraries. A 2008 report commissioned by JISC in the UK argues that support for data-intensive research will require a ‘strategic repositioning’ of the library. Research libraries have traditionally been structured and staffed around disciplines. In contrast, new service models embrace multidisciplinary approaches that require fluid staffing structures and provide support throughout the research lifecycle.

(Alma Swan- Skills, Role & Career Structure of Data Scientists & Curators: Assessment of Current Practice & Future Needs: http://www.jisc.ac.uk/publications/reports/2008/dataskillscareersfinalreport.aspx)

Furthermore, research is increasingly international and support for research must also reach beyond the boundaries of a single institution, making it difficult to develop a institutional business case for some services.

Libraries will have to overcome these challenges if they are to nurture services in the future.

Enhancing our value through collaboration

University libraries are influenced by the contexts in which their parent organizations operate. This environment is increasingly digital, international and interdisciplinary.

More than ever, libraries must cooperate in order to develop effective services that support the information needs of their students and faculty.

In some areas, collaboration is an absolute necessity. Interoperability between systems, content, and access policies is critical for creating seamless access to digital collections across institutional and national boundaries.

Digital repositories, for example, need to operate with common standards and metadata schemas, similar policies, terms & conditions, in order to build an aggregated content resource based on a distributed worldwide repository network.

There are already collaborative initiatives working on these interoperability issues, for example, the Confederation of Open Access Repositories, which has members and partners from the repository community from around the world (including the Digital Library Federation of Japan and the National Institute of Informatics)

Or, DART-Europe- a partnership of research libraries and library consortia in Europe who are working together to improve global access to European research theses.

The next step will be to work together to begin to better integrate the various domain repositories to enable linkages between data, publications and other related materials.

Preserving the world's digital information will also require close collaborations amongst governments, academic and national libraries, as well as other memory institutions. The scope of the digital world is immense and no one institution can tackle this problem alone. In addition, the technical and economic requirements that come with digital preservation suggest that these activities cannot be well managed at the local level. At the international level, IFLA and a consortium of national libraries, the IFLA-CDNL Alliance for Digital Strategies (ICADS) are working to develop and

promote interoperable standards for the preservation of digital information, as well as offering training modules to assist libraries to preserve their digital holdings.
http://www.ifla.org/icads

Institutions will need to work together to define roles and responsibilities. They will need to coordinate with each other to collaborate on content preservation efforts that build on their strengths while minimizing duplication of effort on a national or international scale.

New developments in library service require that libraries work much more closely with academic communities. E-research and data support services must be developed based on the needs of a specific scholarly discipline or research project. Developing VREs, for example, require constant feedback from researchers. According to JISC, “the most effective way of approaching the development process of VREs is a participatory mode of development, with researchers closely involved in generating the requirements and evaluating their implementation.”

(from Virtual Research Environment Collaborative Landscape Study, JISC. http://www.jisc.ac.uk/publications/reports/2010/vrelandscapestudy.aspx)

While each nation has its own unique policy environment, there are an increasing number of common issues that impact libraries across the world. Academic libraries can be much more effective in promoting their values when they act in concert with each other. Library and library organizations

are effective if we work across national boundaries to develop a unified voice and common strategy for the library community in responding to international laws being introduced, or advocating for specific policies.

In conclusion, it is clear that academic libraries must drastically shift their services to meet the needs of students and scholars in the digital world. Some libraries are already beginning to do so. These services tend to be pro-active, and contrast with the relatively passive role academic libraries have played in the past. They also often demand much closer collaborations between librarians, scholars, students, and IT specialists and each other. It is now up to us to demonstrate our value in this evolving landscape.