

# **User Education in a Virtual Library Environment : Challenges and Opportunities at the Institute for Research in Construction**

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## **Abstract**

This paper discusses the concepts of bibliographic Instruction at the Institute for Research in Construction, National Research Council Canada. The introduction of a world-class Virtual Library, including top scientific databases, journals and electronic current awareness tools, offered IRC's engineers an end-user access to a variety of bibliographic and full-text information. While LIS (Library and Information Services) at IRC has always provided these services for engineers in a mediated fashion, the Virtual Library afforded IRC librarians an opportunity to introduce a Bibliographic Instruction process which has improved the self-sufficiency of users for their research. With a combination of 1/2 day group training sessions and one-on-one technical support training, LIS is accommodating user needs at IRC. The paper introduces the initiation of IRC's Virtual Library bibliographic instruction program and subsequent challenges and opportunities. As a point of closure, the paper examines the future challenges for LIS in terms of continuing effective Bibliographic Instruction at the Institute for Research and Construction.

## **Introduction**

The Institute for Research in Construction is Canada's national research agency for civil engineering in the construction sector. As part of the National Research Council, the Institute performs valued research in building codes, urban infrastructure, indoor environment, building envelopes and fire risk management. Library and Internet Services, a small group of three, is responsible for both the IRC library and the external website. The library houses a specialized collection of civil engineering materials yet, receives supplemental support from the resources available on NRC's Virtual Library. The Virtual Library, coordinated by NRC's Canada Institute for Scientific and Technical Information, offers employees electronic access to a significant portion of the world's scientific, medical and technical information. While the details of this system have been discussed elsewhere,<sup>1</sup> it is essential to note that all IRC staff have access to thousands of electronic journals, databases and other resources.

The significance of Virtual Libraries in a corporate setting can not be underestimated and training is an essential component of their success. Recognizing this fact, libraries and information centres have implemented a plethora of bibliographic instruction programs. For example, Universities have made a significant and growing effort at institutionalising the role of bibliographic instruction within university curricula. Programs in these university libraries range from a single class introduction to full-credit courses on information seeking.<sup>2</sup> In many cases, university students are leaving science programs

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<sup>1</sup> Scott Mellon, "Creating a Virtual Library at the National Research Council of Canada" INFIRE 2000, Ottawa, Canada, May 9-12, 2000.

<sup>2</sup> There are many cases of such initiatives, see for example, Rob Morrison and Betty Dance, "Effective Library Research in High School Students: The Challenge of the Engineering State," *Reference Service*

with advanced information seeking behavior.

The evolution of the CISTI Virtual Library and its migration towards digital information stimulated an immediate response from IRC's Library and Internet Services. In the summer of 1999, LIS decided to introduce a bibliographic instruction program focussing upon the desktop utilities of the Virtual Library. Although instruction classes had been formerly offered at IRC, the introduction of the Virtual Library necessitated a reengineering of the program. With only two information professionals at IRC, responsibility for this initiative fell logically upon myself, the reference librarian. Having an interest in bibliographic instruction and believing that it falls within the knowledge base of a reference librarian, I regarded this as a learning opportunity for myself and IRC staff. This paper explores the challenges and opportunities encountered during the implementation of the Virtual Library training program at IRC.

### **Engineer as user**

Before the design of the Virtual Library training program could begin, I had to take time to examine the target audience and information culture at IRC. LIS has a client base of engineers, a group recognized as possessing inadequate information seeking skills.<sup>3</sup> At IRC, there are still researchers who can be considered at best, peripheral users of library services, relying upon a strong connection with the invisible college and journal routing for their information needs. This fact notwithstanding, IRC's information culture seems to be shifting towards the *proactive user*. Coinciding with the growth of online media and the explosion of scientific information, IRC researchers are now seeking the necessary skills to become information savvy in the digital world. Staff reaction to Virtual Library training is the most obvious example of this new information culture at IRC. Response to the initial advertisement was far above the expectations of LIS. Similarly, one-on-one training sessions have become increasingly popular with IRC research staff.

There seems to be two reasons for the change in IRC's information culture. First, researchers have little time to spare during working hours. Desktop access to the latest engineering information through a Virtual Library is perceived as an essential component of successful time management for their work routine. Second, many of the new staff and students arrive at IRC with an existing level of information literacy. Once arriving at IRC, new staff seek out both the Virtual Library and training for its use. It is clear that researchers at IRC are now willing to supplant traditional information seeking patterns for current methods.

### **Course Selection**

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Review, Fall 1994; Sue Hollander, "Assessing and Enhancing Medical Students Computer Skills: A Two Year Experience At the University of Illinois at Chicago," *Bulletin of the Medical Library Association* 87 (1), 1999; 67-73.

<sup>3</sup> Maurita Peterson Holland and Christina Kelleher Powell, "A Longitudinal Survey of the Information Seeking and Use Habits of Some Engineers," *College and Research Libraries*, January 1995; 7-15; Morrison and Dance.

The Virtual Library includes databases, electronic journals, alerting services electronic reference tools, competitive intelligence sources and quality-vetted hotlinks. With so many tools available to the user, the challenge became the selection of the material to teach. An exhaustive training program for the Virtual Library was never contemplated and a focussed approach was adopted for a variety of reasons. First, LIS wanted to guard against *user overload*, one of the most disruptive features of training programs.<sup>4</sup> Secondly, IRC researchers would be interested only in relevant materials which, could help them in their job - nothing more. Finally, the VL training session was scheduled for three hours and time constraints dictated that a finite amount of materials be covered.

With this in mind, what was to be taught? Reference librarians in special libraries have to be cognizant of the information needs of their clientele. Having an intimate knowledge of both the Virtual Library and the IRC staff, I had to make an "educated guess" on the resources that would both be well received and fulfill course objectives. The training program was structured with a prejudice towards the instruction of article-level searching, alert services and access to electronic journals. Conversely, this prejudice leaned against other the types of information such as competitive intelligence / business related information, web-hotlinks etc. Fortunately, the products and services selected for the course garnered the most enthusiasm from those participating in the class.

### **Course objectives**

The Virtual Library training sessions had three pronounced and obvious objectives which migrate from the general to the specific: 1) introduce the broad concepts of Virtual Libraries / electronic information and explain how it can add value to work ; 2) introduce general information seeking skills in the online world ; 3) show users how to navigate NRC's Virtual Library and locate the specific information required. A discussion on how these objectives were met is discussed in greater detail further on.

### **Manual writing**

With the objectives clear and the subject areas selected, the development of the manual remained. Although there was a general concept in mind, converting the concept to a deliverable item proved to be a tremendous challenge. Having no existing manual at IRC for Virtual Library instruction, the process began from scratch. Considering the exponential growth of NRC's Virtual Library in 1998-1999 any existing manual would likely have been outdated in any event. The creation of this training manual required a great deal of thought, patience, organization and above all, time. Taken in its 30 page aggregate, the IRC Virtual Library Training Manual is a step-by-step instruction document on how to navigate NRC's Virtual Library and search available resources. It is

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<sup>4</sup> Collin Orions and Laurie Sabol, "Using the Web to Teach Library Research Skills in Introductory Biology: A Collaboration Between Faculty and Librarians," *Issues in Science and Technology Librarianship*, (Summer 1999), 1-7. <http://www.library.ucsb.edu/istl/99-summer/article2.html>

designed to be didactic during class instruction, yet, function as a working tool once participants return to their workstations. It contains a high visual content, inspired by basic DIALOG manuals. Since the manual was structured to offer step-by-step instructions for the participants, the visual component is a central characteristic.

The initial and of most fundamental step in creating the manual was the examination of the course objectives. To achieve the goals of the VL training, each module has an introduction to the topic, an instructor demonstration and practical exercises for participants. The practical aspect of the manual is of paramount importance. Trainees are more likely to absorb material in which they have practical or hands-on exercises.<sup>5</sup> The more time afforded to the trainee, the more they will practice and eventually understand. Practice time grants users the occasion to organise their search strategies, test them out on a database, refine them, and obtain an immediate feedback from the instructor.

### **Facilities**

In an effort to adapt to the digital revolution, the setting for bibliographic instruction has shifted from the library to electronic classrooms.<sup>6</sup> For IRC's training session, LIS selected of the computer classrooms available at NRC's onsite training facilities. Each of the twelve terminals was equipped with current versions the two most widely-used Web browsers, Adobe Acrobat, and Microsoft Outlook, NRC's current Email system. While the idiosyncrasies of the training room are not important, it is crucial to note that there were no technical disruptions during the four courses. With time restrictions and a course designed to display the value of digital information, this fact was not trivial. A technically sound classroom will facilitate any course, reducing any potential frustrations for both users and teacher, a fact that should be considered when selecting venues.

### **Fulfilling Course Objectives**

The training consisted of four half-day sessions and a total of 39 researchers took part in the program. As previously outlined, the first objective of this course was to introduce the concepts surrounding Virtual Libraries and electronic information. Virtual Libraries are familiar to information specialists, but not necessarily to the average searcher. In all four training sessions, it was clear that participants were unanimously confused about the capabilities of NRC's Virtual Library and thus, I was careful to delineate what the Virtual Library was and what it was not. Finally, I fielded all subsequent questions, ensuring that the concept was clear.

Once I was comfortable that the class had a grasp on the concept of Virtual Libraries and electronic information, we shifted towards the second objective. Since most participants

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<sup>5</sup> Nancy Dewald, "Web-based Library Instruction: What is good Pedagogy?" *Information Technology and Libraries*, March 1999, 26-31.

<sup>6</sup> Keith Gresham, *Experiential Learning Theory, Library Instruction, and the Electronic Classroom. Colorado Libraries*, Spring 1999; 28-31.

were novice searchers possessing minimal search skills, the course covered the general search strategies required in today's online world. For example, there was a basic introduction to databases, what they are and how to search them. Most new database users do not apply many of the search tricks available to them.<sup>7</sup> For this reason, I wanted to instill general searching skills such as fielded searching, boolean logic and truncation so that they could be applied on any search interface.

The bulk of the session was dedicated to the third objective; teaching participants how to navigate through the VL and locate information to satisfy specific requirements. Put simply, participants were there for this type of information. For example, researchers wanted to learn how to locate articles on fire-detecting software or access electronic full-text articles from *Fire Safety Journal*. IRC's Virtual Library training was heavily slanted to fulfilling this objective and this proved to be the bulls-eye for most participants.

## **Challenges of Virtual Library Training**

### *Diversity of User Skills*

While proving to be a rewarding experience for both user and instructor, the development of a bibliographic instruction program had its' challenges. With any group of students, there will be a variety of bibliographic, computer and analytical skills. Once the training sessions began, the skill disparity of users became apparent. Some participants had visited the Virtual Library prior to the course, others had never and in one case, there was a researcher for whom this training session was his first experience with the World Wide Web. At the time of the course, the new millennium was only months away and I automatically, yet, wrongly assumed that all participants would possess the basic commands of the web. In hindsight, making web skills a prerequisite would have improved the quality of the session for all participants.

Trying to deal with diversity was a arduous task. Admittedly, during the practice exercises, a disproportionate amount of time was spent with those participants who had little experience with electronic resources. This is not surprising and was basically expected. It was a pleasure to accommodate those students with less web experience, however, I am certain that I missed opportunities to help the information savvy students take advantage of some of the more advanced features of the Virtual Library.

### *Diversity of VL Resources*

Other limitations to the training existed in the nature of the Virtual Library itself. First, like most Virtual Libraries, the NRC system houses information from a variety of publishers, database vendors and website hosts. Despite some common elements, many databases display different features and interfaces. In the case of e-journals, the differences are even more acute. The e-journal section of NRC's Virtual Library is simply

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<sup>7</sup> Diane DiMartino, William Ferns and Sharon Swacker, "CD Rom Search Techniques of Novice End-users; Is the English-as-a-Second-Language Student at a Disadvantage ?" *College and Research Libraries*, January 1995; 49-59

a repository of hyperlinks to licensed journals which reside on publishers' and thus, NRC maintains no control over those sites. Since publishers have designed so many different ways to access e-journals, instruction on this topic posed a challenge. Acknowledging the diversity of e-journal access, I reserved a large question period for this particular module, something that all instructors should be prepared to do.

### *Gaps in Coverage*

NRC's Virtual Library offers many of the scientific, medical and technical resources, however, there are gaps in coverage. As a subject, chemistry is currently underrepresented in the Virtual Library. Chemical information is essential for experimentation in the composition of concretes, fireproof materials, sealants, etc. Similarly, IRC performs critical research in behavioural sciences such as human reaction during fires. Multidisciplinary databases such as Current Contents or CISTI Source Table of Contents Database provide a degree of relief, but, the caveat remains that these are general databases and do not offer comprehensive indexing of any one subject. In many cases, research of this nature requires mediated searches from LIS, a fact difficult to explain during a course designed to stimulate self-sufficiency of users.

Dates of coverage is another limitation of the Virtual Library. Within the 3,500 electronic journals and over thirty databases, the dates of coverage range between 1970 and 2000. Licensing, resources and publisher variation are all contributing factors to this lack of consistency in coverage. For these reasons, it would not be possible to create uniform dates of coverage, but such realities did not preclude user frustration during the course.

### *Challenges from Murphy's Law*

During presentations and training sessions one should always reserve time for the fact that what can go wrong, will go wrong. In some cases PDF files would not open. In others, certain journals were temporarily out of service. During our database training, the number of users licensed to access Engineering Index was exceeded. These type of problems will arise during every training session however, the true challenge for the instructor is to respond to these issues responsibly. In an effort to appease participants and maintain their trust in the system, I tried to suggest possible reasons for such problems, explain the limitations of the Virtual Library and make note that any such problems were atypical, which they were.

## **Concluding the Session**

In closing the training session, I reiterated three major points. First, I made it clear that the benefits of the Virtual Library instruction would only emerge with practice and familiarity. Second, I guaranteed IRC staff that technical support will always be available by email, telephone or in person for questions regarding all aspects of information seeking. Finally, I expressed the reality that the Virtual Library concept may not be for everyone. I assured participants that LIS will continue to offer literature searches, article ordering and other services in the event that any IRC staff wished to

revert back to mediated services. While some information professional could argue that this was copping-out or giving in, I offered this solution to ensure that LIS did not alienate any of our clientele.

## User Response

User response was plentiful and LIS has been careful to draw accurate conclusions regarding the Virtual Library training sessions. These conclusions came from a variety of sources; class discussions; class evaluations; technical support and ordering patterns. LIS ascertained valuable ordering information for a sample of 19 participants who took part in the in the Virtual Library training sessions.<sup>8</sup> Using these forms of feedback, it is clear that IRC employees have obvious information seeking behavior.

The IRC Virtual Library training was successful as a whole, but there were certain areas that were more popular than others. Quite simply, the participants in the training session wanted to learn how to search the Virtual Library for articles, technical reports or conference papers. Database searching for article-level citations was extremely popular and users were quick to discuss the value of electronic access these resources. Within the limited time span of the course and without exception, each participant was able to find citations relevant to their current research. Since the databases searched are integrated to an automatic ordering system, staff found articles and ordered them during training sessions. Both the class discussions during the session and the evaluation forms revealed participants' pleasure at locating the articles necessary to improve their work.

Surprisingly, the electronic delivery of Tables of Contents were the most popular service. I use the qualifier "surprisingly" because I had assumed that it would be the database searching. For engineers, scanning through the TOCs of key journals is an integral way of acquiring articles.<sup>9</sup> Through the CISTI Source Select Table of Contents service, IRC staff can register to receive electronically delivered TOCs. Like the databases, the TOC service allows IRC staff to order documents directly through the Virtual Library. As part of the practice exercise for this module, each participant registered for the TOC service and subscribed to journals in their field.

Again, both the class discussions and the evaluation forms unanimously revealed the importance of this service for engineers. Additionally, statistics from our test group of 19 participants, show that from December-March, there have been there have been 436 articles ordered through this mechanism, an average of 22.9 articles per user, more than all other forms of ordering combined. The reasons for its success lay in the fact that such a system requires little effort apart from the initial registration. The key is the *push factor*. The process goes as follows; IRC staff receive an email notification, click on a web hyperlink, browse the tables of contents and order - very user friendly.

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<sup>8</sup> The introduction of CISTI's new Intellidoc service limited the number of participants that could be examined and the dates of the information. For this study, the report could only generate statistics for December-March, 1999-2000.

<sup>9</sup> A. Korah and G. Devarajan, "Information Needs and Use Patterns of Rubber Scientists," *IASLIC Bulletin* 36 (3), 1991; 89-94.

It was interesting to note that a few of the comments showed the degree to which users' had not only attended class, but learned to think critically about Virtual Library issues. One new user inquired as to the possibility of article-level linking from bibliographic database. At the time of the course, the Virtual Library was in the process of initiating this feature on some of its databases. It was enlightening to observe participants of the course thinking of such issues.

## **The Post-Session Era**

### *Support*

The post-session period has afforded LIS an opportunity to learn more about the bibliographic instruction process. The most obvious lesson learned was that the interaction between teacher and student is not a finite process, continuing long after the training sessions are over. In the weeks immediately following the training course, the requests were more numerous than normal. LIS continues to receive requests for technical support by email, phone calls and personal support visits.

### *One-on-one sessions*

Another trend is the accelerated demand for one-on-one Virtual Library training sessions.

One-on-one sessions have proven to be highly successful at IRC. It would appear that the increased interest in VL instruction is based on a combination of reasons. First, being an institute of only 220, there seems to be a positive word-of-mouth advertisement for both the Virtual Library and the associated training. Second, LIS is making significant efforts to push the Virtual Library in the form of email updates which highlight any new construction related resources. Third, LIS is offering this training at the user's convenience. Finally, one-on-one sessions are of great benefit to both instructor and researcher. From the client's perspective these personal training sessions are valuable because they create trust and familiarity, offer immediate feedback while taking place at their own workstation. For the instructor, one-on-one sessions offer an opportunity to focus on one user's specific subject area and adjust instruction to the user's skills.

### *Professional Relationship, Better Service and Trust*

Another outcome of the training session was the cultivation of a professional relationship between the participants and the "new librarian". Being at the Institute only four months at the time, it was important to mingle with this group of researchers. I would term this *trust* the intangible of the training sessions since it can not be measured, but has been prevalent since the course.

What does this professional relationship mean for LIS ? One of the strengths of a reference librarian in a special library is the ability to know "who is doing what". During the training sessions, I was granted my first exposure to researchers' area of study. As staff performed the practice exercises, I tried to make a mental note the areas covered by some researchers. While it is impossible to recall every participant's area of research, I have had opportunities to practice an informal SDI service sending researchers unexpected citations in their field.



## **Future Challenges**

As discussed, IRC statistics on the ordering behavior of IRC staff are revealing however, they are only useful if they are interpreted thoroughly and generate some type of response.

The numbers reveal that the CISTI Source Select Table of Contents service is the primary avenue from which researchers at IRC order documents through the Virtual Library. This being true, future one-on-one or group sessions will concentrate more heavily upon the registration and selection of appropriate journals for this TOC service. Similarly, LIS plans to adapt to this reality by introducing half-hour coffee-break sessions highlighting the utility of this TOC service and the procedures to register.

The unveiling of Virtual Library Phase II in June 2000 will initiate alterations to the instruction program at IRC. The changes manifested in Phase II will necessitate a new course structure, manual and approach. The Virtual Library has now amassed an impressive collection of e-journals, and publishers have made significant efforts to add retrospective volumes and issues. By the time Phase II rolls around, there will likely be more than 4000 electronic journals in the Virtual Library, augmented by an expanding archive of full-text articles and publisher SDI services. While this was an important aspect of the first Virtual Library training session, the incredible amount of material available via e-journals may require additional attention in future VL training. .

To continue to be a world-class product, the Virtual Library will continue to add new services and advance the wave of new technologies available. The challenge for LIS is to maintain a constant awareness of these changes. For example, future versions of the NRC Virtual Library will allow customization of a user's search interface, a single interface for searching and other alterations. To be able to offer satisfactory technical support in the future versions of the Virtual Library, LIS must stay abreast of any changes.

## **Conclusions**

With the proliferation of electronic media, the Virtual Library as an information source will gain prominence in corporate and research settings. Teaching users to utilize this valuable source of information is a decisive task which information professional must tackle. While challenges exist, the rewards for the student, instructor and larger institution are immense. In today's knowledge-based society, an informed user group is the most potent commodity. Through a systematic user education program, information specialists can foster a positive information culture and cultivate the *critical proactive user*.