

TO DISSECT A FROG OR DESIGN AN ELEPHANT: TEACHING DIGITAL INFORMATION LITERACY THROUGH THE LIBRARY GATEWAY.*

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I. Introduction

Derrick de Kerckhove, the Director of the McLuhan Program at the University of Toronto, states that the parameters of the digital society are bits and connections. He asserts that everything in a digital society will be reduced to bits and that all bits will be connected.(1) In this emerging digital world , teaching and learning will take a quantum leap from the present print based culture. In a humorous comment that supports this argument, Negroponte suggests that in a society made of bits and bytes, students should be taught biology not by dissecting a frog but by building or designing a frog.(2) In fact, what they may truly be designing is an elephant.

The bits and connections described by De Kerckhov are best represented by the Internet. The Internet's potential as a research, teaching and learning resource is fast becoming a reality. Libraries now routinely post their portion of electronic information resources on their home pages. These library homepages also routinely serve as gateways that reach out to information resources outside of their own localized collections and services. These library gateways usually contain their own online catalogs and other electronic research and teaching materials. On these library Web sites, valuable collections of texts, images and sounds exist some of these are an electronic version of print or analog versions of materials owned by the library ; increasingly some of these materials will be available only in electronic formats without print counterparts.

Consider the existence of the Internet Public Library (URL: <http://www.ipl.org>). This Internet Public Library organizes its electronic collections in the same way that the traditional library organizes its print collections. The Internet Public Library exists only in the cyberspace serving the Internet community. It does not have a physical counterpart. The IPL Director claims that in 10 months 700,000 users from 88 countries visited (clicked) this public library.(3) To date little is

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known about the IPL users' level of sophistication in the use of the IPL's collections and services, and, more importantly, their levels of satisfaction in the way their information needs were met. While there is much need to study user behavior as well as electronic libraries such as the IPL and the home pages of traditional libraries, the more immediate concern for librarians and users alike is to develop training programs that will teach how rapidly growing electronic collections can be effectively accessed and assessed. For many students and faculty, the library gateways into the Internet world are the first step requiring digital information literacy.

For the purposes of this paper, digital information literacy (or digital literacy) is defined as literacy appropriate for the Internet age; it therefore extends the boundaries of traditional literacy. This paper will briefly review the skill sets that are required for the effective use of the traditional library focused on print collections and those that are now required for electronic library collections. It will then point out the common ground shared by these two literacies and how user training in the library gateway is the bridge to attaining digital literacy.

Because the digital environment provides a new way of communicating and a new way of interacting, and because it is heavily dependent upon evolving technology, the training of users in digital literacy not only requires reinforcement of some of the fundamental attributes of traditional literacy but also flexibility and adaptability on the part of librarians and users alike. Therefore, library training in the post digital age must include a paradigmatic pedagogical shift that will educate users to reevaluate older ways of information gathering even as they learn to incorporate these ways into newer patterns.(4)

The technology that permits the storage of vast amount of information and movement along ever speedier information superhighway brings in its train the difficulty of making sense of what has turned out to be an enormous information glut. The current state of what David Shenk calls "data smog"(5) makes traditional literacy alone inadequate for survival in the digital world. Therefore, while digital information literacy shares some of the critical attributes of literacy in the traditional sense, it requires additional competencies. Technical/computer literacy, media literacy and network literacy are among the prerequisite skills that are required for users to be digitally literate.

II. Library Training in Print based Collections

In an attempt to understand training needs in digital libraries, a quick overview of the requirements for access to print collections is first necessary. In the print environment, the prerequisites for effective use of library resources are reading

skills, knowledge of access tools, and the ability to critically evaluate both the access tools and the materials found by these tools. The emphasis is on teaching users how to interpret the different elements of information used in the card catalog. These include preeminently the controlled subject vocabulary developed by the Library of Congress subject headings system. This vocabulary is one of the most important elements, being, as it is, the print version of hypertextual explorations through its subject tracing. Also critical is learning how to obtain periodical literature through different kinds of access tools such as subject indexes, abstracts and citation indexes.

The increased amount of information available to users through machine aided information retrieval has motivated librarians to expand traditional literacy into more comprehensive information literacy. Information literacy emphasizes the user's ability to critically evaluate the information on hand as to its authenticity, currency and appropriateness to the problem solving process, etc.

Print collections have distinct visual effects due to their physical impact. The traditional card catalog, for example, is imposing by its physical size whereas the online computer catalog (referred to as the online access public catalog) does not have this characteristic. The traditional physical card catalog permits a search by author, title and subject of the books (and journal titles and microforms) that the library physically owns. In contradistinction, the many integrated online catalogs posted on the library gateway are multi functional including information on circulation status, new acquisitions, periodical article indexes and, more recently, the articles themselves. To a student with little experience and imagination, the little computer (the hardware) cannot possibly contain all this information! The size of the computer workstation compared to the enormous wooden card catalog (which is often kept side by side with computer workstations) has significant visual impact. The lack of industry standardization in hardware, not to mention the continuous upgrading of software and the relentless development of new products, further confuses novice library users. Do different looking computers do the same thing? Do all computers perform the same functions? An average user of the library gateway is often misled, believing that all information flows from the same source with the same quality, similar to the card catalog. Using information from diverse sources (e.g., networked sources versus stand alone workstations versus LAN) delivered through a variety of media with varying quality is a mystifying experience for novices. The library gateway is thus the first step in teaching students and users similarities and differences between print and digital collections; it begins the process of teaching how to mine the ever deepening pools of digital information that are available on the Internet

III. User Training in Electronic Libraries

When CD databases became available in the mid 80s and popularized the idea of end user searching (users do database searching without a librarian intermediary to help construct search statements) , both users and librarians alike began to realize the enormous volume of value zero information (out of context information) being retrieved from machine readable databases. As a result, Nash and Wilson observed that undergraduate students frequently tap CD ROM databases for citations that are unavailable, inappropriate, and ultimately unreadable and irrelevant to the student's needs; they emphasized the necessity of training users in citation evaluation at the micro level and, at the macro level, in training in the relational connections between and among different access tools.(6) While the same basic ability to critically evaluate sources is required for digital literacy as for print collections, digital literacy requires added knowledge of hardware/software use and a whole new set of vocabularies and basic computer skills, particularly the ever popular windows program and certain web browsers.

The library gateway further accelerated the number and variety of filtered as well as unfiltered information sources; the offerings of commercial databases now available through the library gateway as well as other freely available web sites all require enhanced critical thinking on the part of users. Understanding the scope and the nature of the library gateway helps users to explore other web sites. Under these circumstances, ad hoc based training is less effective than establishing a systematic method for judging the reliability of each web site. Gilster suggests the following criteria that are necessary for content evaluation of a website; authorial background particularly through understanding the Internet domain structure (e.g., .com, .edu., .org, .dk., etc.), currency, stability of information and whether the web site provides new content rather than being a mere reflection of old media.(7) On the obverse side, understanding these criteria helps guide users in determining when and what topics are appropriate for Internet search.

The Internet, and the library use of it as a gateway, has introduced a whole new set of vocabularies that users must understand in order to effectively use electronic library collections; some examples of these vocabularies are:

Metadata

Negroponte points out that in the information age, it is often information about information that is more valuable than information itself. As an illustration, he refers to the larger revenue that is garnered by TV Guides versus that of the major networks.(8) Understanding metadata is the first step in capturing the extent of a Web site, just as understanding the scope of the traditional card catalog helped users to find books.; this data about data will play an increasingly important role

as the hyper textual nature of each Web site connects users through its hyperlinks to hundreds of related web sites.

Search Engines

It is important to give users a basic understanding of different search engines and how to use them. Users need to be encouraged to read online instructions and to bear in mind the malleability of databases and search engines. Certain Internet search engines, such as INFOseek, Yahoo, AltaVista, etc., are rapidly becoming household names. Users also need to learn the different interfaces required in each database once they are on a site. The library gateway is a good introduction to the use of different interfaces.

Internet Vocabularies

There are basic sets of vocabularies that digitally literate library users must be able to understand when using electronic library collections through its gateway. They are: hardware and software, work station, LAN, network, web browser, URL, link, bookmark, gophers, telnet applications, link, icons, click, left/right click of mouse, down click and when to place the pointers, and listserv among others. As in any new teaching and learning environment, familiarity with and understanding of these new vocabularies are the first step in smooth communication between the user and the librarian.

IV. Common Ground

To reiterate Glister's definition, digital literacy is gaining the ability to understand and use information in multiple formats from a wide range of sources when presented via a computer.(9) The common characteristic shared by the olders and newer literacies is being able to critically evaluate information sources. Yet while evaluative skills are equally necessary for digital and print literacy, what has occurred is a fundamental transformation in the magnitude of the skills that are needed. The following matrix presents the converging and diverging skill sets required for print and digital literacies.

Literacy	Required Skill sets	Evaluative skills	Access Skills
Pre Internet Information Literacy	read/write	critical thinking within a filtered information environment	catalog vocabulary indexes/abstracts/citation indexes
Post Internet Information Literacy	read/write/type	enhanced critical thinking within a filtered and unfiltered environments engines	computer skills/vocabularies online catalog/Internet vocabulary search

The matrix clearly reveals that literacy in the digital society requires a quantitative growth in the skills needed to locate vastly expanded information sources as well as a proportional qualitative shift in evaluative skills. Due to the increased amount of information that is now available, enhancing evaluative skills is clearly essential for post Internet literacy.

V. Conclusion

This paper has briefly reviewed the different literacies that are required for print and electronic environments. It has argued that training users through the library gateway can lead them to achieve digital literacy. It has also emphasized that the most important personal characteristic needed for the effective use of digital tools is adaptability. The malleable and dynamic nature of the Internet provides users with an opportunity to create and build their own electronic library. The paper suggests that being able to evaluate information sources critically is a competency that is required in both print and electronic environments. They are differentiated, however, both quantitatively and qualitatively. Building digital information literacy is truly analogous in power and sophistication to constructing an elephant.

The Nobel Laureate Arno Penzias stated that both knowledge and technology can become allies and adversaries at the same time. He describes the modern society as the age of knowledge destruction. Because new technology constantly requires adaptation, people need to destroy parts of their existing knowledge in order to acquire new technological skills. The role of librarians in the age of knowledge destruction is not to reinforce existing beliefs or prejudices but to help refresh knowledge.⁽¹⁰⁾ For digital literacy, familiarity with what information is made available, by whom, and how it is made available becomes extremely important. Penzias emphasized the librarians' need to provide users what they need before users know what they need. Training users through the library gateway is one such example.

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