

QUEENS COLLEGE OF THE CITY UNIVERSITY OF NEW YORK

INTERNET TRAINING OF CUNY LIBRARIANS

**SUBMITTED TO
DOCTOR KAREN SMITH**

**BY
WILLIAM JIANG**

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TABLE OF CONTENTS

Chapter

INTRODUCTION	
Abstract.....	3
1. The Problem	
Introduction.....	4
Background of the Problem.....	4
Purpose of the Study.....	6
Hypotheses.....	8
Limitations and Delimitations.....	8
Definitions.....	9
2. Review of the Literature	
Introduction.....	10
Historical Perspective.....	10
History of the Intel Microprocessor.....	14
Archaic Internet Features.....	15
Netscape Battles Internet Explorer.....	16
The Current State of Search Engines.....	17
The Future of the Internet.....	19
Internet2.....	19
Tim Berners-Lee.....	20
The Role of Computers in Libraries.....	20
Use of the Internet for Library Service.....	21
Barriers to Training.....	21
The Training of Librarians.....	22
Libraries Becoming Current with the Internet.....	27
Computer Based Training (CBT).....	28
Internet Based Training.....	29
"Traditional" Internet Training.....	31
CD-i as a Training Medium.....	34
Summary.....	35
3. Methodology	
Introduction.....	37
Specification of Variables.....	37
Pilot Studies.....	38
Selection of Subjects.....	38
Data Collection and Recording.....	39
Assumptions.....	40
Hypotheses.....	41
Testing of Hypotheses.....	41
Conclusion.....	42

4. Findings: Analysis and Evaluation

Introduction.....	43
Findings.....	44
Year of MLS Acquisition Among 113 CUNY librarians.....	46
CUNY Librarians and the "Information Society".....	47
Initial Internet Training of CUNY Librarians.....	49
Sources of CUNY Librarians Ongoing Internet Training.....	50
Ability of CUNY Librarians to Web Publish.....	51
Search Engine Preference among CUNY Librarians.....	52
Browser Preference among CUNY Librarians.....	53
Frequency of E-mail Monitoring by CUNY Librarians.....	54
Number of E-mail Accounts Held by CUNY Librarians.....	55
Online Activity of CUNY Librarians.....	56
Interpretation.....	57

5. Summary, Conclusions, and Recommendations

Summary.....	60
Conclusions.....	61
Recommendations.....	62
Works Cited.....	64

ABSTRACT

This paper chronicles Internet learning and usage habits of a sample size of 113 of the total universe of 320 CUNY academic librarians as of the fall 1998 semester. The respondents to the survey represent a random sample of the eleven senior colleges, six junior colleges, the graduate center library and the law school library.

The Internet usage and learning habits of CUNY librarians demonstrate the proactive approach that CUNY library management took to the technological training needs of its employees. The survey results show that work-led training consisted mostly of mentoring by colleagues and in-house workshops. Self-directed learning (SDL) was also an important component of the total Internet learning picture for these CUNY librarians. In the course of this paper's completion it was noted that despite the wide array of technological training methods available that use multimedia and other electronic mediums, human training, either peer to peer or workshop methods, were the most widely used modality.

The sample of librarians surveyed was a heterogeneous sample in that five decades of librarians were represented; however, it was a group of individual librarians which were united by showing their dedication through service to the CUNY mission of offering access to a quality education regardless of the student's race, religion, or ethnicity.

CHAPTER 1

THE PROBLEM

Introduction

According to the 1997 Statistical Abstract of the United States one in four people is on the Internet. The Internet has become a social phenomenon. In today's information society, either you are on it or you are not connected.

Now, more than ever, librarians need to be "electronically aware" or be outstripped in knowledge by their patrons, thus becoming in danger of becoming irrelevant in today's information society. This especially holds true for the CUNY academic librarians. They are expected to be at least on par with the electronically savvy students they serve.

The information resources that CUNY librarians choose to use and become familiar with are in large part determined by the institutional choices of software and hardware.

Background of the Problem

The training of librarians to meet the electronic demand of the Internet has occurred in library schools since 1995, about the same time the rest of American society started going online. Also, this was about a year after Netscape broke off of Mosaic and offered itself in the stock markets. Before this time the Internet was recognized as important, but often overlooked because of its not very appealing command-prompt interface. With the advent of the World Wide Web in 1994, the Internet became a very used resource. The booming popularity of the Internet had something to do with the

graphical content and multimedia appeal of the World Wide Web. Netscape rode that information wave and became the most widely used browser by 1995 commanding over sixty percent of the browser market. However, since then, Microsoft, led by Bill Gates, has forced its way into the browser market, so now the ratio is about one-to-one. About fifty percent of all browsers are Netscape and about fifty percent are Internet Explorer. Netscape still has more of the browser market than IE, but the question is-- for how long? The Internet Explorer uses the easiest language that has ever been created—Visual Basic. This is directly opposed to arguably the most difficult language ever created, Java, for the Netscape browser. If the ease of application becomes the deciding factor between Netscape and Internet Explorer, then Netscape leads a doomed existence.

Library students were trained on command-prompt e-mail systems on the VAX and UNIX systems such as VMS Mail, PINE, and ELM. These were thought to be useful exercises because if one could master the command prompt interface, it was thought that just about any computer system could be learned. These days, computer literacy is taken for granted at most library schools. One is expected to know a bit about operating systems, word processing, and graphical programs. Indeed, some web page design publishing ability seems to be required of people even in the introductory library science classes. There is a steep learning curve to overcome for many students who have not had much computer experience. They are expected to be able to hold their own in this electronic environment. These exercises, though still used, are not very appropriate these days because of the availability of free e-mail accounts on the Excite, Yahoo!, and Hotmail servers. This researcher believes that these command prompt interfaces are still

used by some library schools to “weed out” some of their less technologically able students.

For the CUNY librarian, the Internet is a vital way to keep in touch with various online services to which CUNY subscribes such as CUNY+, Britannica Online, InfoTrac Search, and Lexis-Nexis. Knowing how to use these powerful resources is part and parcel of being a CUNY academic librarian. The CUNY librarian must know how to use these databases because of the need of the students to master CUNY’s information resources.

Purpose of the Study

The review of the literature in chapter two shows that there is much information available on Internet training that applies to academic librarians. This study of Internet training for CUNY librarians is unique in that it targets a specific population, and it chronicles the status of a select population of academic librarians after the first few years the World Wide Web has been introduced. To show the information habits of CUNY librarians is the most part of this study. How they initially received their knowledge, how they update their knowledge, and the particulars of what information resources they use are the information retrieval goals of this study.

In order to discuss how the Internet will has changed the position of today’s CUNY librarian, it is important to discuss today’s technologies and compare them to the technologies that existed during the introduction of the World Wide Web, so we can see how far we have come technologically. In 1993 Intel came out with the 60 MHz Pentium processor. Today, Intel, which has the most commonly used microprocessor chip, has a

Pentium II clock speed of 450 MHz. The microprocessor speed has increased almost eight-fold in just five short years. Back in 1994 a large hard drive would have been one gigabyte, today harddrives with 10gigs or more are not very much more expensive than the workhorse 4gig drives. Also, telephony has improved greatly. Back in 1994 the fastest modem (short for MODulate, DEModulate) was a 14.4 kbps modem. Today the best modem would be the 54.4kbps modem. The way that the modem companies improved upon the 33.6 limit on the analog lines was by using data compression technologies.

The average RAM on a PC back in 1994 was 8MB today RAM can be up to 128MB. That is, a lot of information that can be stored in RAM (Random Access Memory) that was not possible before.

What can be inferred from this discussion is that Web technologies can be accessed faster, things can downloaded and uploaded much faster, thus certain technologies will be more feasible now than in the past. With developing technologies coming into existence the limits that do exist will be broken down.

Hypotheses

To effectively apply the scientific method, the researcher has created the following four hypotheses:

- A) CUNY librarians have received most of their technical training after completion of their formal MLS education.
- B) CUNY librarians regularly participate in continuing education to update their knowledge of electronic resources.
- C) CUNY librarians are actively involved in web publishing.
- D) CUNY librarians prefer Netscape for personal use above other browsers.

It is not known if these three hypotheses will be proven true or not, as is the case of any hypotheses in their initial state. This being the case, all results gained through the survey introduced in chapter three will be examined by chapter four and discussed at length in chapter four. If the hypotheses are proven false by the collected data, then the scientific method will have been followed, and the hidden truth will be made plain.

Limitations and Delimitations of Study

This being a scientific paper in the field of library science, the limitations and delimitations of this study must be addressed. Herein, a limitation is defined as a shortcoming of the paper, i.e. weaknesses of statistical techniques or inadequacies of technical knowledge. The delimitations of the study are conscious boundaries that the researcher has deemed fit to use to circumscribe the goals of the paper. No work of importance is without its delimitations stated or implied. If a paper is to have goals it

must concentrate on certain germane topics. Two delimitations of the immediately follow:

- A) Target audience includes only CUNY academic librarians.
- B) Both full-time librarians and part-time librarians are included in the study.

One limitation of the study is included here:

- A) Target audience is restricted to CUNY academic librarians only, so the population is limited to a particular set of academic libraries and librarians in the New York City metropolitan area.

Definitions

The term "CUNY librarian" refers to an employed librarian who has a knowledge base in more than one discipline and is currently employed by the CUNY library system. CUNY librarians are, for the most part, not only information professionals holding advanced degrees in library or information science, they are specialists also in one or more subject areas, often with advanced training and a double masters.

CHAPTER 2

REVIEW OF RELATED LITERATURE

Introduction

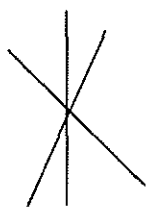
There has been a lot of information published about the Internet in the past four years, since the popularization of the World Wide Web. There is not a significant amount of information concerning the Internet training prior to 1989 (Chang 1993, 8). This could be because before 1994 the Internet was not very popular with librarians and the general public. It is theorized by the researcher that this is because using the Internet then entailed using an awkward command-prompt interface that was not in the least bit intuitive or powerful to use. The WWW brought a powerful, appealing multimedia component to the Internet. Soon afterwards, librarians became involved in Internet training and Web publishing. How librarians received and are updating their Internet knowledge is the focus of this paper.

Historical Perspective

The history of the Internet begins with the creation of ARPANET (Hafner 1997, 23), the network created by the government agency ARPA (Advanced Research Projects Agency), in the Eisenhower administration just after the launch of the Soviet Sputnik

satellite in 1957. President Eisenhower wanted “his scientists” to break the lead the Soviets had on the space race. Unlike many, President Eisenhower believed in basic research.

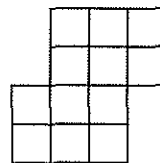
The scientist that invented the structure of ARPANET was Paul Baran. He believed that “...redundancy is the key to network survival.[in case of nuclear war].” (Hafner 1996, 52) This way a node could be destroyed and the network would still be operative. To do this he wanted to create what he called a distributed network.



Centralized



Decentralized



Distributed Network

Paul Baran’s second idea was to fracture the messages and reassemble them at their destination. He wanted a packet-switched network, as opposed to the circuit-switched networks of the telephone company. The information would be broken up into packets and then routed in such a way as to be reconstructed at the target point. This would make the network more robust. An English physicist named Davies had similar ideas. The English physicist called the chunks of information that were to be moved around “packets”, coining the term. Bolt Beranek and Newman based in Cambridge, Massachusetts, got the job of building the ARPANET. Their engineers decided that there would be intermediary computers between nodes, hence their name—IMPS. The

backbone of ARPANET would carry up to 1,000 bits per second on dedicated lines between nodes. The specs of the actual IMPS follows- they were Honeywell 516's with 12K ferrite core memory, and the IMP program (programmed in Honeywell 516 assembly) was 6,000 words long. The reason they decided on using the Honeywell was that they were relatively small, fast, and built to military specifications. To demonstrate to potential buyers how sturdy these computers were at computer expos the Honeywell salesman would use a crane to lift the computer above the floor, and then the salesman hit it with a sledgehammer to show its robustness. This appealed to the military to no end. They used "checksums" in their data transmission at a 24bit checksum. It was no wonder these engineers needed late-night work breaks at their nearby Chinese restaurant. Telnet was born in 1969. In late 1970 BBN started using a 50 kilobit line. FTP was born in July 1972 (then known as RFC 354). The emoticon was first used on April 12, 1979 by a newcomer to the MsgGroup(later, becoming newsgroups),Kevin Mackensie who was inspired by a Reader's Digest article.

In 1978 there were a few networks that were accessible to ARPANET users, and these networks were all joined by the TCP/IP protocol. Thus, the Internet, in a form that was familiar to us was born. "TCP shifted the reliability from the network to the destination hosts. TCP would be responsible for breaking up messages into datagrams, reassembling them at the other end, detecting errors, resending anything that got lost and putting packets back in the right order. IP(Internet Protocol) responsible for routing individual datagrams." (Hafner 1996, 207) In 1989 the NSFNet backbone was upgraded to 1.544 Mbps. Today the backbone is 155 Mbps.

In order to understand the exponential growth of the Internet it is necessary to understand three things: one, the exponential growth of the microprocessor, two, the increased speeds of modern telephony, and, three, the increasing vastness of secondary storage equipment.

The first computers did not have the advantage of integrated circuits, the advantage of the microprocessor. They relied on vacuum tubes for computation, this made the computers huge and terribly inefficient because the tubes took an inordinate amount of electricity to operate, and every time a tube blew the whole computer would have to be shut down to replace the vacuum tube. Thus was the world of the first computers such as ENIAC and their ilk. The history of the microprocessor is the history of the Intel microprocessor chip. Even their first chip which operated at 108 kHz meant that the clock speed operated at 108,000 cycles per second. This was a great leap forward for computational technology. The microprocessor has increased in speed on an order of four hundred thousand percent in less than 30 years. This is an increase of more than ten thousand percent in processor speed each year. It was in a New York Times article that IBM has a working prototype of a one gigahertz processor. Some theoreticians did not believe that silicon technology could achieve these speeds. The amazing speed of the IBM prototype dwarfs even the Intel Merced which is projected to run as fast as an 800MHz in 1999. We haven't even begun to use gallium arsenide to construct computer chips. When we do, they theoretically should run on an order of about four times faster than their silicon counterparts. This means that there is a possible speed of about four gigahertz that is possible on a single microprocessor!

Parallel computing on personal computers has been available since 1997. A single microcomputer in the future could theoretically run at a clock speed of 8,000,000,000 hertz. That is eight billion cycles per second.

Secondary storage has improved drastically over the years as well. The initial technology centered on large spools of magnetic tape. Seek times were horrendous, and they weren't able to save very much on each bulky tape. The first CD-ROMs came about in 1985. Medline was one of the first databases that was transferred to CD-ROM technology. In 1990 a large hard drive could hold 250 kilobytes of information. Today, a personal computer system from Dell with a 400 MHz Pentium with a 10 gigabyte hard drive retails for under \$2,000.

The first modems that were produced ran at 200 baud. Today, because of data compression technology the 33.6 thousand bits per second limit along analog lines has been transcended by the 54.4 thousand bits per second modem. That means that the connection speeds to the Internet have increased over fifty times.

The researcher has capsulized the history of the Intel microprocessor below.

History of the Intel Microprocessor (from Intel's website at <http://www.intel.com/intel/museum/25anniv/Hof/tspecs.htm>)

Model of Intel Chip	Clock Speed	Year Introduced
4004	108 kHz	November 15, 1971
8008	108 kHz	April 1, 1972
8080	2 MHz	April 1, 1974
8086	Up to 10 MHz	June 8, 1978
8088	Up to 8 MHz	June 1, 1979
80286	Up to 12.5 MHz	February 1, 1982

Intel 386 DX	Up to 33 MHz	October 17, 1985
Intel 386 SX	Up to 33 MHz	June 16, 1988
Intel 486 DX	Up to 50 MHz	April 10, 1989
Intel 486 SX	33 MHz	April 22, 1991
Pentium	Up to 166 MHz	March 22, 1993
Pentium Pro	Up to 200 MHz	November 1, 1995
Pentium II	Up to 450 MHz	May 7, 1997

Archaic Internet Features

Gopher was a very popular Internet feature prior to the introduction of the World Wide Web. "Gopher originated at Minnesota University and is defined as a distributed document delivery service for electronic publishing across the TCP/IP network. It is a client-server protocol which accepts queries from clients and responds by sending a document which may be viewed on the screen, saved to a file, or printed". (Chang 1993, 15) After the advent of the World Wide Web, it has fallen by the wayside as a feature of the Internet that is almost never used anymore along with Jughead and Veronica, the two searching utilities that search Gopherspace for documents: "As the files on Gopher servers are gradually converted to HTML files, Gopher (and therefore Veronica and Jughead) will become less important."(whatis.com)

Besides being Archie's (the popular cartoon character's friends) Archie and Veronica are acronyms for, respectively, Jonzy's Universal Gopher Hierarchy

Excavation And Display (Jughead) and Very Easy Rodent-Oriented Net-wide Index of Computerized Archives. "Veronica was developed in November 1992, by a team from the University of Nevada at Reno... Veronica is only capable of searching words (titles)... Veronica supports Boolean operators (words such as AND, OR, and NOT)." (Serdar 1995, 1) Jughead is a lot like Veronica. The main difference is that it searches only a confined area of gopherspace.

LYNX is antiquated. It's defined as "... full screen-text only Web browser"(Pfaffenberger 1997, 303). It was created by Lou Montoulli of the University of Kansas. The reason for LYNX's downfall was that it couldn't display images.

Netscape Battles Internet Explorer

In 1995, Internet Explorer (IE) wasn't even an option. At the time this paper is being written, it commands about half of the browser market. Back in 1995 the two major two Web browsers were Netscape (75%) and Mosaic, a distant (13%). Internet Explorer wasn't even on the scene. Windows was the major platform used (46.6%), followed by Macintosh (28.6%), and third was Unix (18.1%)(Jayfar, 1995, 1). By bundling IE with its operating system in 1996, Microsoft has incurred anti-trust litigation against itself by doing this. Microsoft Internet Explorer, today, has 45.6% of the browser market. Netscape Navigator has 52.2% of the market as of July 7, 1998. (Woods 1997, 1) The fact of the matter is that IE has forced its way into the browser market.

The Current State of Search Engines

The simple search engines are anything but simple. They are complex, powerful Web searching tools that include but are not limited to Alta Vista, AOL Netfind, Excite, HotBot, Inktomi, Infoseek, LookSmart, Lycos, Northern Light, Search.com, Snap, WebCrawler, and Yahoo! The oldest have been around since 1994. A lot of people use Yahoo! It is a "well-known and well-respected search engine." It sports the largest directory (as opposed to search engine), listing 750,000 web sites as of Dec. 1997. (Major 1997, 8) If you wish to find anything on the Web, these search engines are your first stop.

A search engine named Coronado automatically translates Web documents from English to one of three languages: French, German, and Spanish. In the future they will also have translator programs for Chinese, Dutch, Italian, Japanese, and Portuguese. (Bethoney 1998, 27) There are knowledge 'management packages' that use statistical probabilities to refine search criteria, and tries to predict future search strategies by understanding the user's past search strategy. (DeMocker 1998, 16) There is a book price search engine called Acces. This search engine searches twenty-five online book stores including Amazon.com and Barnes&Noble for the same book, and ranks the book stores prices. This German-based company also has an advanced feature that enables the user to find the best prices of books in lots of ten at a time. (JC 1998, 40)

What follows on the next page is a chart that summarizes the searching features of the various Web search engines as of October 27, 1998.

Search Engine Comparison Chart from <http://www.kepl.lib.mo.us/search/chart.htm>
 And from <http://search.yahoo.com/search/options>

	Yahoo!	AltaVista	Excite	HotBot	Infoseek	Lycos	Northern Light	Webcrawler
Default Word	intelligent	Or	And	Pop-up menu	Or	Or	and	or
Boolean Connects	And, or, not	And, not, near	Or, and, not	And, or, not	And, not	And, not, adj., near, before, far	Or, not	And, Not, adj
Phrase Search	Quotation marks	Quotation marks	Quotation marks	Quotation marks	Quotation marks	Quotation marks	Quotation marks	Quotation marks
Truncation	Use '*'	Use '*'	automatic	No, type in variant spellings	yes	no	Use '*'	no
Capital Letter	insensitive	Exact matches	Matches	insensitive	matches	insensitive	insensitive	insensitive
Words Included	Use '+'	Use '+'	Use '+'	Use '+'	Use '+'	Use '+'	Use '+'	Use '+'
Word Exclusion	Use '-'	Use '-'	Use '-'	Use '-'	Use '-'	Use '-'	Use '-'	Use '-'
Duplicate Detection		Grouped under one title	yes	Grouped under one title	yes			
Special Features		Limit by date, language, or format and field followed by:	Concept searching suggests terms	Limit by date, media type, file type, by suffix location		Search for image and sound files	Custom folders	

The Future of the Internet

At this point in time, the Web is essentially a two-dimensional medium because HTML (HyperText Markup Language), the language that is the building block of a Web page, is a two-dimensional page layout script. The third dimension is the wave of the future with VRML (Virtual Reality Markup Language). Right now the connections are quite slow, ISDN being the fastest reasonably priced connection at 128Kb/sec. That 128 Kb/sec. speed could reasonably support a two-dimensional world, but what about the third dimension? VRML worlds, loaded with today's market technology, would take forever to load. Basically, they aren't an option for today's web designers. However, 10Mb/s cable-modem technology does exist for faster connection speeds. That's almost five times faster than T1 technology, right in your own home! There are a few VRML browsers that are already available: Community Place, enReality, Oz Virtual, Pueblo, WebOOGL, and WorldView.

Internet2

Today's Internet is fast—a T1 is 1.544 megabits/second, a T3 can carry 44.746 megabits/second, and the vBNS backbone of the Internet can carry 155 megabits per second. The vBNS can hold 3,100 54.4 KB/sec modems simultaneously. Though fast, this speed is like a crawl compared to the Internet2's mBone capabilities: 622 Megabits/second, about four times faster than today's fastest Internet component. Congress has allocated 142 million dollars for Internet2 funding, so it's definitely going

to happen. Internet2 will be reserved for academic uses until about the year 2002. Internet2 will have more video capabilities than the Internet because of its faster connections. (Izarek 1998, 239)

Tim Berners-Lee

Tim Berners-Lee is the man who was the driving genius behind the creation of the Web. He created the World Wide Web in 1989 while working at CERN, the European Particle Physics Laboratory. Presently, he is the head of the W3C (World Wide Web Consortium), the organization that is concerned with WWW standards, located at MIT. He also invented HTML (HyperText Markup Language).

(<http://www.geo.web.ru/Mirrors/www.w3.org/People/Berners-Lee/Longer.html>)

The Role of Computers in Libraries

Before the Internet, librarians had experience with computers. "Computers in libraries, first introduced in the 1970s, began with library systems designed to serve the needs of library staff by replacing such cumbersome processes as manual circulation, filing, and record keeping" (Carew 1995, 8). As time passed, computers became even more integrated into the library systems: "In the 1980s card catalogs in public libraries were gradually replaced by on-line public access catalogs (OPACs) which facilitated the use of online indexes, full text searching and retrieval facilities, and automated record

keeping computer-based decision making. OPACs have further enhanced the quick retrieval of information electronically for both reference staff and patrons.” (Carew 1995, 10)

Use of the Internet for Library Service

The Internet opens possibilities for asking reference questions on various automated mailing lists and newsgroups. Generally, chat rooms are not used for any kind of academic work. “Using the Internet for reference service also includes the transmitting of requests and answers via the Internet to and from remote users... Obscure questions can be asked within the various newsgroups.” (Chang 1993, 20)

The Internet has had competition from NREN. However, with the advent of the WWW, the Internet is a much-more used resource. “A perusal of the ERIC database resulted in location of numerous citations to articles or research reports dealing with Internet or its proposed successor, the National Research and Education Network (NREN).” (Hickox 1994, 21) So far, the Internet reigns supreme as the world’s premier information network.

Barriers to Training

Some librarians look at today’s technology as a barrier, others as a challenge. “Technology itself can contribute to the creation of barriers. When information was only contained in written form, anyone possessing literacy skills could obtain access. But now some forms of information needed require the possession of electronic equipment and

special access accounts.” (Pulliam 1996, 42-43) Librarians must look at it as a challenge to be overcome, if they are to succeed in this information age.

A lot of the problems that people have in this information age are psychological. “In addition to the technological barriers, there are obstacles created by the need to understand and use complex systems without clear instructions. The largest network of all, the Internet, is mostly an uncharted area that yields its secrets only after practice and study.” (Pulliam 1996, 43)

Another barrier to training on the Internet is not allowing enough hands-on experience for students in a class. One good exercise in “Internet literacy” would be to “team build” a web page for the library. “Training is very important, but hands-on experience is truly the only way to learn the Internet.” (Garofalo 1995, 86)

The Training of Librarians

There are many ways that librarians are being trained on computers and on the Internet. Most of the training of tomorrow’s librarians that is going on today is in the library schools. At Queens College, today, we have many such training classes. There are online and optical database searching classes, an Internet class, web-page design and evaluation class, and a virtual library class. In addition to these very timely and useful classes our library school has an introduction to library science class (701) is being taught online this semester for the first time.

The two modes that are most commonly used in the field today are, firstly, the management perspective to training, that is, that management is responsible for the development of staff, and, secondly, there is the perspective that librarians themselves are

responsible for their own training. "The lifelong process of professional development in librarianship can be initiated by the individual librarian, but creating the opportunity and facilities for training is the shared responsibility of the librarian themselves and their employer." (Carew 1995, 15)

Today, the terminology referring to the people who get information is changing. Some would contend that "...a more appropriate term ...[for reference librarians of this day and age]... would be 'access engineers' because it encompasses the new activities demanded from reference librarians: filtering of electronic information so that it may be synthesized into knowledge and creating knowledge maps to allow the uninitiated to navigate in unfamiliar academic areas." (Silva 1994, 161)

Use of the Internet raises many ethical, legal, and cultural issues. "It is probable that a component of in-depth training should embrace ethical issues and legal aspects of network use as they pertain to the academic environment." (Hickox 1994,23) Netiquette is very necessary. For example, if one is writing an e-mail message to a LISTSERV, it behooves the writer to NOT WRITE IN ALL CAPS because that would bother the people on the list to no end. Just as people don't like to be yelled at verbally, the same holds true to their loud writing.

Often, librarians are trained on the job: "...the bulk of training for both new and established librarians occurs on the job, or in continuing education programs." (Carew 1995, 15) However, computer skills are expected modern librarians. "The reference librarian of the future must be proficient in using the virtual library." (Stephenson 1994, 212) The better the computer skills, the more probable their employment from library school: "...libraries look for prospective reference librarians who possess computer

skills.” (Carew 1995, 12) Indeed, today’s entire society is being educated on computers, so librarians must stay ahead of the learning curve or be out of a job: “Students from elementary through graduate school are receiving greater exposure to the use of computers. Students entering graduate library programs in the future will have sophisticated understanding of computers.” (Carew 1995, 12) Not knowing computers is a definite minus to a prospective employer. It is essential to have “...online searching skills ... at today’s reference desk.” (Stephenson 1994, 219)

Management-led training is the most frequent type of training. “Examples of staff continuing education include vendor-provided programs, participation in professional associations, access to courses offered at firms, and courses offered by other sponsors.” (Carew 1995, 17) Indeed, sometimes, the hiring library intends to train their librarians on the latest and greatest library methods: “...many library managers in special libraries planned for staff development through continuing education at the time of hiring a staff member. A library must account for the hidden cost of continuing education for staff when calculating their budgets. Libraries that follow such a management style are loudly stating their commitment to a high level of library service.” (Carew 1995, 17)

A planned approach to training is preferred to haphazard training of the library staff. “Surveys have been found to be a good method for needs assessment.” (Carew 1995, 20) Once the surveys are completed and digested by the management, they can concentrate on the particular areas of improvement that are necessary. “Random participation in continuing education by staff members is not as productive as a planned approach.” (Carew 1995, 18)

Management must keep in mind that vendor's training programs are generally offsite, which means travel time for the librarians, and also follow-up should be offered by the vendor. This way assessment of the librarian's mastery of the subject may be ascertained. Another type of organization that offers training is the professional organization.

The "in-house" training program can be less expensive than the outsourcing approach. For this to work, you must have a few knowledgeable librarians in-house. "[In house training programs]... are designed to serve short term and long term needs. They can take form as a result of a librarian's attending a vendor training session and returning to share the fruits of the session with other members of the staff. These programs can also be designed around videotapes, workbook training, online training files, and user aids designed by vendors." (Carew 1995, 21-22) This idea is further explained by Carew: "Many organizations train staff by informal methods, consisting of on-the-job instruction by more experienced colleagues. Mentoring, cooperation with other librarians is a practice used in the training of librarians. Designated groups and task forces can be especially valuable when the initiative comes from the staff." (Carew 1995, 23-24)

Individual librarians taking responsibility for their own education on the newest technology and methods happens often: "...continuing professional education should not only rest with management but should also include the individual. This is referred to as self directed learning (SDL)." (Carew 1995, 24) What are some examples of SDL? "[Examples of SDL]... include: courses, conferences, seminars, workshops, and visits; reading professional journals, distance learning, special project work or assignments,

undertaking research, writing or training activities, sabbaticals and paid educational leave, and membership in related professional associations.” (Carew 1995, 25)

Some of the older librarians are computerphobic. They view the computers as alien and strange. “Resistance to new technology can cause librarians to fail to effectively learn how to use electronic sources. This resistance coupled with the current diversity of online services and rising public demand for information which is only available electronically can generate tremendous stress for a librarian.” (Carew 1995, 26) Carew believes that “...Regular staff training can be used to overcome these fears. Training should be continuous, using a simple hands-on approach.” (Carew 1995,27)

In 1994 McClure, et.al. wrote “...the Internet is still not user-friendly in many regards. There are inadequate tools and guides to access and use it, and its organizations often chaotic. Working with it can sometimes be frustrating and intimidating.” (McClure 1994, 29) Back then, the Internet was dominated by Gopher and Lynx and a host of other difficult to use, non-graphical interfaces. They were very difficult to use mostly because they required you to work with a command-prompt without graphics. This environment was not user friendly at all.

To teach a user how to type in a bunch of keystrokes to get their answers may not be the best approach. A more creative approach is required, which challenges the information seeker to think abstractly with Boolean logic. “Cognitive learning can be associated with the formulation of a mental picture or holistic conceptualization of the working of the system. Behavioral learning is reflected in the performance of specific tasks, which demonstrate that a user understands the principle or the model for which the tasks are applicable (Baker 1980, 92) Cognitive learning is stressed in the Internet

environment because it can get one out of unfamiliar terrain if it is understood holistically. "Where the Internet is concerned (and computers in general, for that matter), technologies change too quickly for traditional training to apply. Instead of constant and rote practice to learn a specific system until tasks become second nature, training must include a conceptual component that allows learners to shape their general understanding of how a system works." (Brandt 1997, 51)

Libraries Becoming Current with the Internet

Libraries, are now based both in print and in electronic resources. "In just a few years... great universities will be measured, at least in part, by the quality of their campus information infrastructure. Libraries, computing centers, and networking and telecommunications units must come together to create a logical, effective system of information provision for teaching, research, and service support. The library needs to assert a leadership role in the organization of the overall campus information structure." (Dougherty 1993, 346) Truly, the electronic age has affected our libraries in a positive way. "The new methods of communicating by way of the Internet in addition to the resources and services available will have an ongoing impact on both how we work and live." (Pulliam 1996, 18) Traditional library issues about reliability of resources remain in the electronic format. "The future of electronic library services seems bright, but only if we are able to [maintain] the library's traditional high level of user support and the reliability of older types of library services." (Pulliam 1991, 32-33) "Issues to consider in an electronic environment are 1. Don't believe everything you read, 2. Who is the

author?, 3. Is the source credible? These are the same issues that librarians have faced in the past—only the format of the information has changed.” (Pulliam, 1996, 42)

Computer Based Training

CBT (Computer Based Training) is not a new concept. As early as 1989 CAI (Computer Assisted Instruction) was available for MEDLINE. (Perkins 1989, 201) With the increasing power of computers, though, the multimedia aspect of the computers has become much stronger. “Numerous studies have shown that the use of videodiscs in training substantially improves learning for the user. Moreover, videodiscs are highly durable, and can withstand repeated use without suffering picture degradation like videotape. Indeed, training as a whole is by far the largest market for videodiscs.”(Mascioni 1988, 184) With multimedia CBT the only limit is the imagination of the instructor: “The nice thing about multimedia training is that there are a lot of ways to implement it.” (Fritz 1997, 130)

Back in 1996 there were no generic multimedia training packages, and the only way to get a multimedia package was to have one custom designed. This has changed with the introduction of the MPEG video standard and with the growing power of computers. (Allen 1996, 36) “When Sigma Designs released the RealMagic MPEG decompression boards, Clarity committed to this de facto MPEG standard and today continues to act a Sigma Designs reseller... In time, Clarity will move to MPEG-2 as DVD becomes more popular and “pushes” MPEG-2 technology into the mainstream.” (Fritz December 1997, 130-1)

The advantages of CBT are many. Because it is learner-driven the retention rates are much higher than instructor-driven learning. Also, it is a lot less expensive in the long run by saving many instructor hours. "Good CBT is not only faster than classroom training—and nearly always cheaper over two or three years—it is also better. People learn better with multimedia training; they remember what they learn more accurately and longer, and they are better able to use what they learn to improve their performance." (Allen 1996, 44)

An example of how a library has used CBT in training its personnel is the example of the University of Tennessee, Knoxville. The University of Tennessee, Knoxville (UTK) utilized CBT training for staff training, with very positive results. (Bayne 1994, 78) One hundred percent of the staff thought that CBT was an essential new technology: "100 percent believed that CBT could be effective for some staff training, and 96 percent would support CBT for all new staff." (Bayne 1994, 79) Not only was it supported on a theoretical basis, but it was also supported on a very practical level by the ensuring of uniform orientation of all library staff to the UTK library system.

Internet Based Training

It seems that the majority of the librarians on the Internet are self-taught or mentored by a colleague... "Sixty-two of the seventy-five respondents to a recent LIBREF-L survey reported being at least partially self-taught. Thirty-six respondents acknowledged having learned, at least in part, from colleagues while thirty-five

respondents reported having used guides as part of their Internet learning experience.”
(Stephenson 1994, 213)

One of the innovative approaches to Internet training combines a mixture of CBT and WBT...“When designing training sessions don’t overlook multimedia and interactive options. Computer based training (CBT) and Web based training (WBT), although in their infancy, are becoming practical and cost efficient alternatives to traditional instructor led training and are becoming popular.” (Bell 1998, 20) Web-based training bring up a lot of issues concerning how one is to pay for the services: “...Web delivery of training also brings up all kinds of dilemmas about how to charge for the training...”(Fritz 1997, 131) However, WBT is growing as an option for training: “The area of Web-based training (WBT) is moving incredibly fast.”(Hawkins 1998, 55)

A very practical opinion about the feasibility of WBT for newbies is given by Brandt: “..if people have had Windows training (or if they’ve taught themselves), they should be able to use a mouse to point, click, and scroll. And that’s all they need to do to interact with a Web-based tutorial, for instance. At the beginning, they don’t need to understand a Web browser to learn how the Web works.” (Brandt 1997, 51)

There are good e-mail introductions to the Internet: “[One good introduction to the Internet is]...through Patrick Crispen’s Roadmap Workshop. Distributed through e-mail, these 27 lessons teach new users about the Internet. Because each lesson is devoted to only one topic, and is deliberately brief, new users are not overwhelmed with new information.” (Balas 1997, 43) Also, BACK2SKOL is another good introduction to the Internet. It consists of 30 lessons and they can be accessed from their web site. (Balas 1997, 43)

An Internet resource for Internet trainers is NETTRAIN. It is a LISTSERV that deals specifically with the issues that arise for an Internet trainer. (Balas 1997, 44) It is useful for a new Internet trainer, or an experienced trainer.

“Traditional” Internet Training

Even in the age of computers competent instructors are needed to guide students along a fruitful line of inquiry. A few rules of thumb for instructor-led classes are—keep the classes small (no more than ten students), allow as much “hands-on:” experience as possible by the students, and allow feedback from the students. “Successful training programs are 50 percent material and 50 percent presenter. Just because you know it and wrote it, doesn’t mean you’ll (initially) be great at teaching it. Acting as a trainer is a new and difficult role for many information specialists. Don’t give up. Practice makes perfect.” (Bell 1998, 20) One example of a Internet training program follows: “[Our Internet training program]...consisted of six one hour sessions covering the Internet: Introduction to Networks and the Internet, E-Mail, OPACs, Non-bibliographic Resources, Transferring Files: FTP and Usenet, and using the Internet at the reference desk.” (Stephenson 1994, 215) The various protocols are covered without too much time devoted to the actual architecture of the Internet.

Some tips to Internet instructors regarding their students: “[When training someone to use the Internet]...be patient, avoid the overuse of jargon, and train people to think, not just to do.” (Stephenson 1994, 221)

The smaller the class, the more individual attention the students get. “Will the training be interactive, one-on-one, small group, classroom, self-instructed, videotapes,

computer or Internet based, job aids, or a combination of these? Will the program be instructor led?(facilitator) or learner led (computer/Web based) training?" (Bell April 1998, 18) Generally, tutorial was the best option: "The reaction of the faculty and staff to one-on-one Internet training was generally positive." (May 1998, 34)

Training sessions ranged from one to three hours. The longer the class, the fewer sessions needed to complete it. However, retention would suffer the longer the class was held.

As an example of how a library could get a tutor, in the summer of 1995 Maryville College's Computer Department and Library staff got a grant from the NSF to get a node hooked up to the Internet. The Library administration seized this opportunity to train a graduate student from a nearby library school; so she in turn, could spend 150 hours training some of the faculty and high level administrators of Maryville College on a one-to-one basis. This is a very good example of outsourcing because the student doesn't need to be paid. She taught Lynx, Netscape, Pegasus E-Mail, FTP, and telnet in a one hour training session. Primarily, she taught Netscape. The library, in effect, created a demand for training that it could not fill. The training was so in demand that not everyone who wanted the Internet training could get it. (Nugent 1998, 15-25)

A medium that human trainers can use these days to reach many individuals is a distance learning medium. "Last year over 500 IBM employees in North America were taught online skills via satellite as part of a program... As the year progressed many changes were made to the way the course was taught, as Roberta Ferguson, a librarian at the Thornwood Education Center, explained: "The students' evaluations consistently showed they were overwhelmed by the amount of information given in a one-way course.

Some of them even stopped listening at the most critical times. We decided to take a hard look at what we were teaching, and realized we could cut the class down by setting the introduction, and the two other sections as pre-reading... 'We also needed greater interaction,' she said, 'so we introduced more activity—we put an exercise that allowed students access to the online databases so they could make actual searches. We set them questions, such as "Which database did you select and why?"...this activity generated genuine excitement among the students and prompted an enormous amount of follow-up questions amount nuts and bolts search techniques and use of terms."

(Blake 1993, 189)

In the business world of a few years ago... "A series of seminars was offered to introduce all Parke-Davis colleagues to...the Internet... they mostly addressed the theoretical concepts of the Internet and all that can be done, but not how to do it." (Zorn 1994, 60) This lack of hands-on training was a flaw in implementation of this Internet training class.

What follows is an example of a three-hour Internet Training class called

Internexus:

Internexus outline (3 hour session)

- I. INTRODUCTION (20 minutes)
 - A. Introduction of speakers
 - B. Objectives of Internexus
 - C. Introduction to the Internet: physical and logical structure, history, size/traffic, netiquette

- II. FUNCTIONAL ASPECTS OF NETWORKING

- A. Messaging (E-MAIL) (35 minutes)
 - 1. What it is
 - 2. How it works
 - 3. Potential uses: conferencing, discussion groups, USENET, etc.
 - 4. Demonstrations
 - 5. How to find what's available: listservs, etc.

- B. REMOTE LOGONS (TELNET) (35 MINUTES)
 - 1. What it is
 - 2. How it works
 - 3. Potential uses: databases, OPACS, CWIS, etc.
 - 4. Demonstrations
 - 5. How to find out what's available

- C. File Transfer (FTP) (35 minutes)
 - 1. What it is
 - 2. How it works
 - 3. Potential uses: archives, full-text files, etc.
 - 4. Demonstrations
 - 5. How to find out what's available, Archie etc.

- III. Conclusion (10 minutes)
 - A. Present and future developments that affect networking
 - 1. Gopher
 - 2. Sonoma State Internet access program available through online catalog
 - 3. NREN
 - B. What to do/who to contact if you need more information

- IV. EVALUATION (5 minutes)

A model for Internet instruction developed at Penn State by the University Libraries and Information Systems departments.

(Kalin 1994, 205-206)

CD-i as a Training Medium

Ask someone who is in the training field about CD-i, and you'll probably get a puzzled answer. CD-i isn't a well-known training resource. "CD-i could also have a significant impact in areas of the training market that do not require the use of full motion video but could benefit from its capacity for simulation and providing individualized

learning. Users could more easily set their own learning pace with CD-i...CD-i would be particularly well-suited to technical training applications. For instance Ford sees CD-i working well in offering "technical training, like fixing a car or a computer, and starting an engine." Buam believes the manufacturing training market might be a "big market" for CD-i." (Mascioni 1988, 187) This was back in 1988. Obviously, CD-i hasn't caught on in a big way among Internet trainers. "Most other course vendors either provide no customization at all or offer to do it for the client for an exorbitant price." (Fritz 1997, 130) "Because of its portability, CD-i has gained some modest success in the training field...CD-i's problem is that it doesn't have the tracking capabilities that networked CD-ROM equipped PCs do... "CD-i as a medium for video training...never even started simmering." (Fritz 1997, 130)

Summary

Today, Internet training comes in a large variety of mediums for librarians: WBT, CBT, distance education via satellite, mentoring, on the job training, in school, in a traditional classroom type setting, instruction via e-mail, and tutoring. Basically, it boils down to this: one can learn from a computer or a person.

No matter how good computers get, they will never reach the level of a professional human instructor when it comes to troubleshooting and answering questions. There will always be a place for the human element in Internet training and other types of training.

The future of training will deal with developments from the W3C, VRML, and the growth of the Internet2. Respectively, this organization, modeling language, and network will impact many aspects of learning in general. The last thing that we must look at is the continuing improvement of our personal computers: the microprocessors, the telephony, and the secondary storage. The future looks promising for the age of computers and the American information society.

CHAPTER 3

METHODOLOGY

Introduction

The investigator will conduct a survey to investigate the current Internet learning patterns and using habits of CUNY librarians. The survey methodology was chosen to ascertain the current status of Internet training of CUNY librarians all over the CUNY system because the current status of their Internet learning behavior is to be ascertained. The historical mode would not have been the correct modality to use because what the researchers want to ascertain is the current status of Internet training in the CUNY system, not the past status. Content analysis would not have been an appropriate method either because the researcher is not trying to create a guide to any type of literature.

Specification of Variables

The survey methodology is the preferred method of data acquisition in the case of this study because there is no other way to ascertain the current state of Internet training of CUNY librarians without it. The number of years ago the librarian got their MLS is the only independent variable because that is the variable that will cause the effects of the dependent variables. All other variables are dependent variables: how the librarians received their Internet training, how librarians update their computer knowledge, whether or not they have any Web pages up on the Net, search engine preference, browser

preference, the monitoring frequency of their e-mail, the number of e-mail accounts, and the activities that librarians do online are all dependent variables.

Pilot Studies

Before the researcher can continue with the results of this Internet survey of learning methods and usage habits, the past research should be reviewed. In December 1993 Wendy Chang, Lisa Dettling, and Karlene Fyffe, graduate students in the Queens College Graduate Library School, did a survey titled: "Use of the Internet by Reference Librarians in the Academic Environment". They mailed a total of 113 questionnaires and 79 were completed and sent back. They were interested in whether or not the academic librarians in New York State used the Internet or not. Because of the times we live in, it would be ridiculous to try to see whether or not they are on the Internet. The question now becomes: "What features of the Internet do these people use most often and are most comfortable with?"

Selection of Subjects

The subjects of this project were chosen by virtue of the fact that being CUNY librarians; age, race, and gender were not constraints. The fact that only CUNY librarians were included in the survey is both a limitation and a conscious delimitation on the part of the researcher. The purpose of this delimitation is to get a homogenous sample of academic librarians that work in New York State. The researcher will use the

1997 edition of the LACUNY Directory for the contacts that the researcher needed to complete this survey. The researcher will mail out approximately 285 surveys. Every librarian in the CUNY system will receive a survey. The researcher will use the mail questionnaire as the chosen data collection mode. For the purposes of this study, mailing is thought to be the only workable vehicle because this way the anonymity of the subjects can be preserved.

The mail will be the exclusive vehicle through which investigator and researcher will have contact. All subjects will be asked to fill out identical surveys based on their knowledge and opinions. Confidentiality of the subjects is ensured, each will be asked to mail responses in provided self-addressed stamped envelopes supplied by the researcher.

All subjects will receive a personal letter from the researcher describing the project and requesting that they become subjects of the study. The researcher promised that after the project was completed that anyone who wishes to obtain the results of the survey would receive them upon request.

Data Collection and Recording

The research involved in the survey of related literature, as discussed in chapter 2 of this project, was done electronically. First, the researcher searched Lexis/Nexis for articles relevant to ARPANET using the search string "arpanet". This is how the researcher found the book When Wizards Stay up Late. Then, **LIBR** on the CUNY+ OPAC was consulted for keywords on "Internet and training", "Internet training", and "computer training". Also, **DISS** on CUNY+ was consulted for keywords on "Internet

and training". Two dissertations were seemed to fit quite nicely with the researcher's project, so after finding them on DISS the researcher went to the UMI Website and ordered the two dissertations for a total of sixty dollars because no library had them for access to the general public. The dissertations were copied from microformat. The source of the most recent information on Internet technologies was the Internet itself. Information on VRML worlds, Internet2, and VRML browsers were the subjects that were covered by the Internet found in the Yahoo! index. Finally, the short biography of Tim-Berners Lee was found on Infoseek by the search string "tim-berners lee".

Assumptions

It is assumed that all CUNY librarians have an MLS. It is assumed that all CUNY librarians have expertise in an area other than library science, and they are either currently working on or have already have a second master's degree. Furthermore, it is assumed that all CUNY librarians have Internet literacy. That they have e-mail is assumed. That they know the difference between a browser and a search engine is assumed. That the librarians are familiar with chatrooms is assumed. In effect, everything that is being asked of the librarians is assumed by the researcher that the librarians have knowledge of.

Hypotheses

As stated in chapter 1, the following four hypotheses will be tested:

- A) CUNY librarians have received their technical training after their formal MLS education.
- B) CUNY librarians regularly participate in continuing education to update their knowledge of electronic resources.
- C) CUNY librarians are actively involved in Web publishing.
- D) CUNY librarians prefer Netscape for personal use above other browsers.

Testing of Hypotheses

Checking if more than half of the respondents received their initial Internet training from someplace other than Library School will test hypothesis 'A' that "CUNY librarians have received their technical training after their formal MLS education".

Hypothesis 'B' that "CUNY librarians regularly participate in continuing education to update their knowledge of electronic resources" will be tested by checking if more than fifty percent of respondents use some kind of computer training outside of the work environment.

Checking if more than a quarter of the respondents both know how and also do have Web pages up on the Net will test hypothesis 'C' that "CUNY librarians are actively involved in Web publishing".

Hypothesis 'D' that "CUNY librarians prefer Netscape for personal use above other browsers" will be tested if more than half of the respondents choose Netscape as their favorite browser.

Summary

This survey is expected to provide insight into the Internet using habits and Internet learning habits of CUNY librarians. While it is not known what hypotheses will be proven true and which will be proven false, seeking the truth that therein lies will be a useful exercise for the researcher. The interesting point to consider here is that the results that this survey comes up with might mirror Internet training practices of other academic library institutions across America.

CHAPTER 4
FINDINGS: ANALYSIS AND EVALUATION
Introduction

To show the information habits of CUNY librarians is the most part of this study. How they initially received their knowledge, how they update their knowledge, and the particulars of what information resources they use are the information retrieval goals of this study.

This chapter is the analysis of selected data collected by a mailed questionnaire to Academic CUNY librarians regarding their Internet use and training. The researcher chose this topic to ascertain whether the academic librarians were as electronically savvy in their training techniques as they should be and to freeze in a moment of time the Internet training and use of CUNY academic librarians. The study focused upon the following four hypotheses:

- A) CUNY librarians have received their most significant technical training after their formal MLS education.
- B) CUNY librarians regularly participate in continuing education to update their knowledge of electronic resources.
- C) CUNY librarians are actively involved in Web publishing.
- D) CUNY librarians prefer Netscape for personal use above other browsers.

To test these four hypotheses, 320 confidential questionnaires were mailed to academic CUNY libraries in all five boroughs of New York City. The researcher received 129 responses by November 23, 1998. Of these 113 were usable in the survey.

The subsections to follow will include:

- A) A discussion of the findings
- B) Responses to questions found in the questionnaire
- C) An interpretation of the findings as they relate to the research hypotheses.

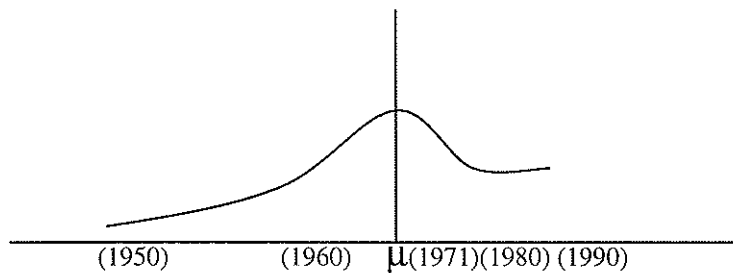
Findings

The survey was well received by the CUNY library community. Just about one in three completed the survey and sent it back to the investigator. This was just enough to construct a meaningful analysis of the findings.

On the whole, the training of the CUNY librarians seemed to be more through the job than self-directed learning. The primary two vehicles of training through work were through workshops or mentoring by colleagues. This means that the managers are working hard to educate and keep their librarians abreast of current technology. This is not to say that the librarians are not vigilantly keeping up of current trends and technology on their own as well. The gap between the work-related training and the self-directed learning is minute. However, there is a more substantial gap between self-directed learning and the work-related training for the keeping current on Internet technologies part.

The distribution of librarians was not perfectly normally distributed, in a mathematical sense. It had two tails on the upper quartile and the lower quartile, the 1950s and 1990s respectively which would correspond to a normal distribution. Only, there seems to be more people in the 1990s because of recent hires making up more of the sample. Also, the 1960s and 1980s were nearly equal in respondents, which also would correspond well to a bell-shaped normal distribution. The capstone of the normal distribution should be that the mean would be the most represented. This is the case here. Most natural phenomena does follow this bell-shaped curve. However, because of the increased number of hires in the 1990s this perfect bell curve is not presented. For a look at an approximate curve look on the following page.

The Distribution of Librarians



The librarians seemed to be very arbitrary when asked whether or not library school had prepared them well for today's "information society". Roughly one third said that it "didn't apply", roughly twenty percent indicated among each of the following choices: "not adequate", "adequate", and "good". Finally, the least common choice was that roughly ten percent indicated "very good".

There were two very distinct major overwhelming questions in the findings of the investigator: the e-mail monitoring and preference of Netscape over all other browsers. A staggering number of CUNY librarians check their e-mail at least once per day. This is nearly all of them. The other thing that was astounding to the investigator was that there was so much support for the Netscape browser. Only time will tell if the recent acquisition of Netscape by America On-Line for \$4.2 billion will place Netscape into a position of disfavor with the CUNY librarian community.

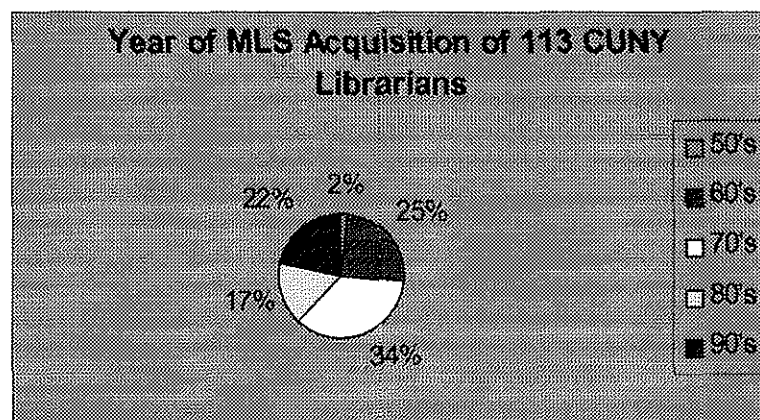
The major issues of the questions raised by the survey have just been discussed. The details concerning the individual questions are flushed out in the following pages.

Responses to questions found in questionnaire

Question number 1: When did you receive your MLS?

The researcher received a total of 129 responses by November 23, 1998. Of the total 129 responses 16 of these the first question incorrectly or had not as of this date received their MLS. The major type of mistake in answering this first question was the respondents putting in the place they received their MLS rather than the date.

The average year that these CUNY librarians graduated with their MLS is 1971. The median, or middle age if ranked, year of graduation is 1975. The mode, or most



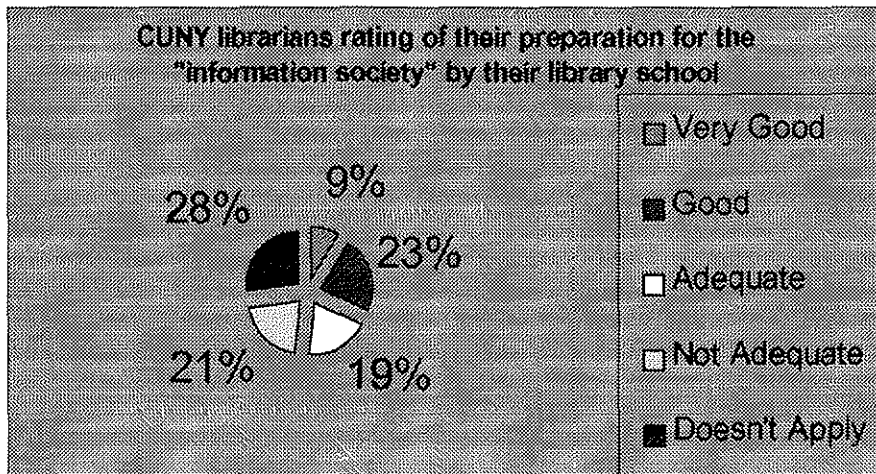
common year of graduation is 1970. Eight people graduated in 1970.

From the graph it may be inferred that the most common years for graduation were the 1970's, with thirty-four percent graduating in total. The second most popular years to graduate were the 1960's, and the third most popular years would be the 1990's. The 1980's were a distant fourth, and the 1950's a miniscule two percent of the total.

Year of graduation and number of people who graduated in this year

Year of Graduation	Number of people that graduated in this year
1950s	2
1960s	27
1970s	38
1980s	18
1990s	24

Question number 2: Please rate the preparation you received for today's information society while in library school.

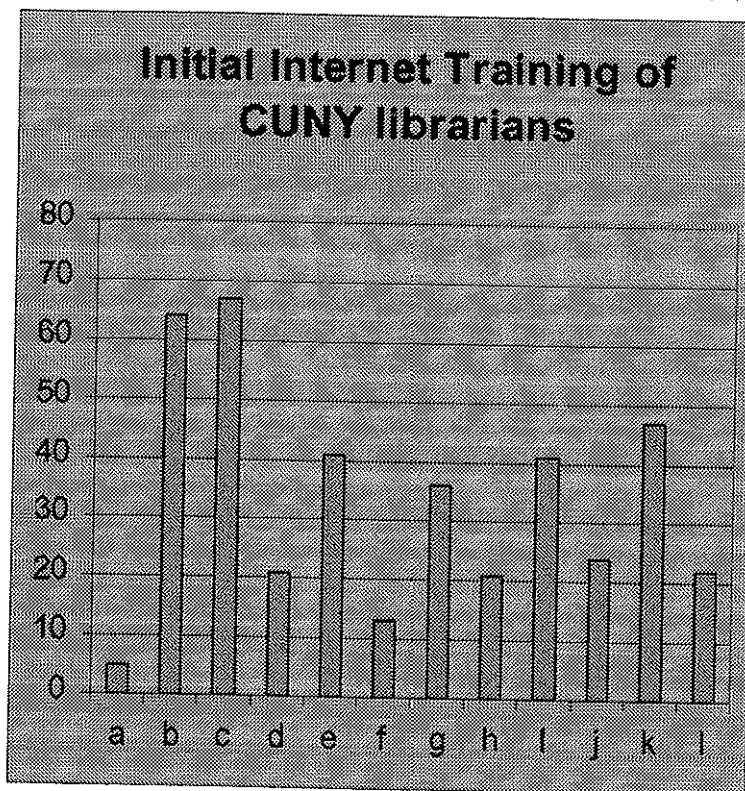


The most common response to the question about Library School being preparing the library school students was "Doesn't Apply". Only ten of 113 respondents said that library school chose "Very Good" to characterize their library school education for today's information society. Nearly fifty percent responded that library school either didn't apply or was not adequate training. This is not a surprising statistic considering that only 5 out of 113 indicated on question number 3 that they received their Internet training from Library School.

Rating of Library School preparation for today's "Information Society"

Rating	Number of Librarians
Very Good	10
Good	25
Adequate	21
Not Adequate	23
Doesn't Apply	30

Question 3: What were the sources of your initial Internet Training (circle all that apply)

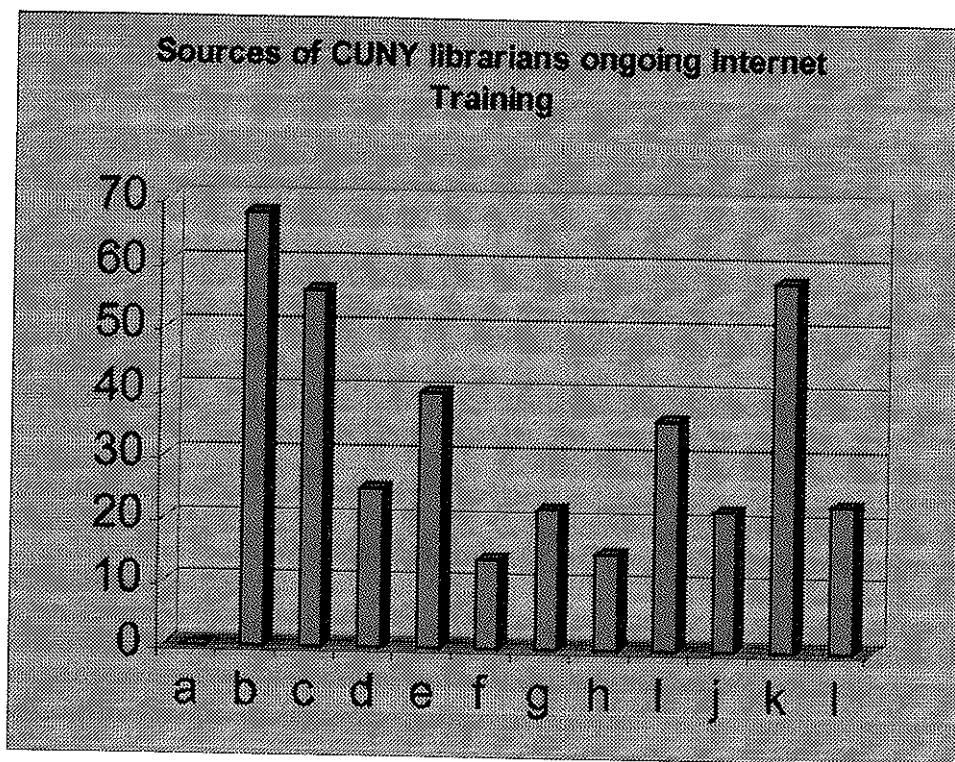


a) Library School.....	5
b) Through the Job: Mentoring by Colleagues.....	64
c) Through the Job: Workshop.....	67
d) Through the Job: Classroom Experience.....	21
e) Through the Job: Attending Conferences.....	41
f) Through the Job: Other.....	13
g) By Self: Continuing Education.....	36
h) By Self: Family/Friends introduced.....	21
i) By Self: Workshops.....	41
j) By Self: Attending Conferences.....	24
k) By Self: Reading Magazines and books in the field.....	47
l) By Self: Other.....	22

The most three most common techniques for gaining the initial Internet training were (c) through the job: workshop, (b) through the job: mentoring by colleagues, and (k) by

self: reading magazines and books in the field. The two least used techniques were (a) library school, and (f) through the job: other. It was very surprising that library school was so low on the scale of where CUNY librarians received their initial Internet training.

Question 4: What are the sources of your ongoing Internet training? (circle all that apply).



a) Library School.....	0
b) Through the Job: Mentoring by Colleagues.....	68
c) Through the Job: Workshop.....	56
d) Through the Job: Classroom Experience.....	25
e) Through the Job: Attending Conferences.....	40
f) Through the Job: Other.....	14
g) By Self: Continuing Education.....	22
h) By Self: Family/Friends introduced.....	15
i) By Self: Workshops.....	36
j) By Self: Attending Conferences.....	22
k) By Self: Reading Magazines and books in the field.....	58
l) By Self: Other.....	23

The graph on the preceding page shows that choice (b) Through the Job: Mentoring by colleagues was the most common source of continuing Internet training. Next was choice (k) By Self: Reading magazines and books in the field. Third in popularity was (c) Through the Job: Workshop.

The three least popular methods of ongoing Internet training are (a) Library School, (f) By Self: Friends/Family Introduced, and (h) By Self: Attending Conferences.

Question 5: Do you know how to construct web pages?

There is a marked difference between those who know how to construct web pages and not along lines of currency of the MLS. Of the 88 people that received their MLS before 1990, 18 know how to construct web pages. That's 20% of those who graduated before 1990. Of the 24 people that graduated from 1990 to present, 11 know how to construct web pages. That's 45.8% of that population. Therefore, there is a significant difference between those who graduated after 1990 and those who didn't. 25 percent of the total population know how to construct web pages.

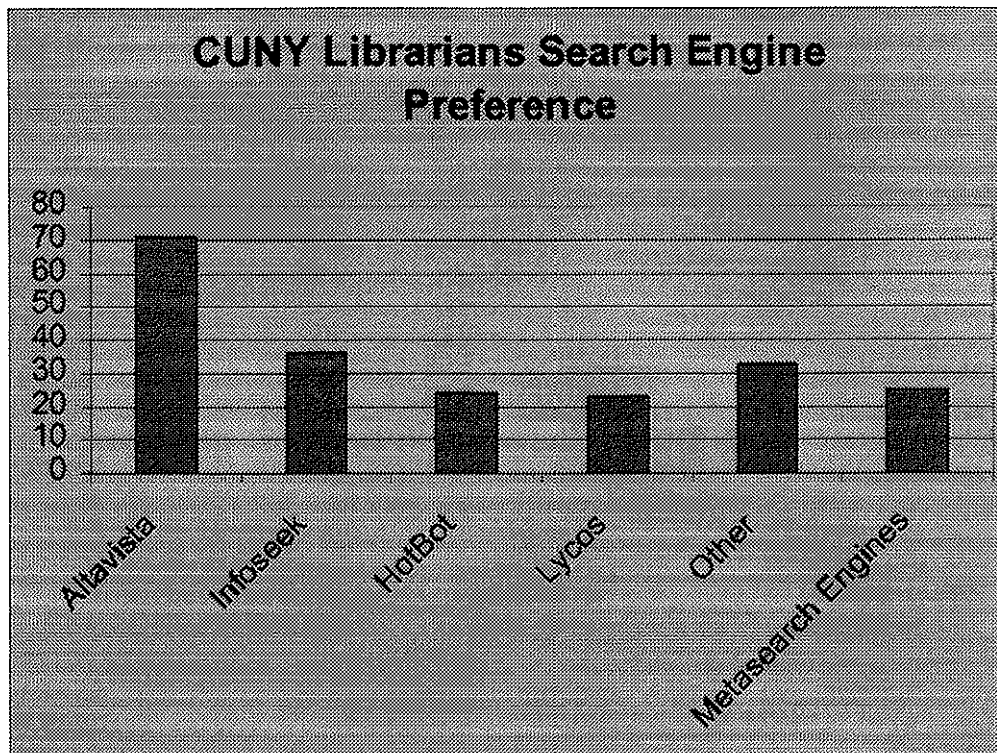
6) Which search engines do you prefer? (circle all that apply)

Question number 6 asked which search engines were preferred. Altavista was the most chosen search engine. Infoseek was a distant second. Third, even though it wasn't a choice on the survey, was Yahoo! The table below numerically summarizes the findings.

Search Engine Preference	Number of people with that preference
Altavista	71
Infoseek	36
HotBot	24
Lycos	23
Other (Yahoo, Excite, Northern Light) et.al.	33 (25 of these are Yahoo!)
Metasearch Engines (Dogpile, Metacrawler, DirectHit, Metafind, Google, etc.)	25

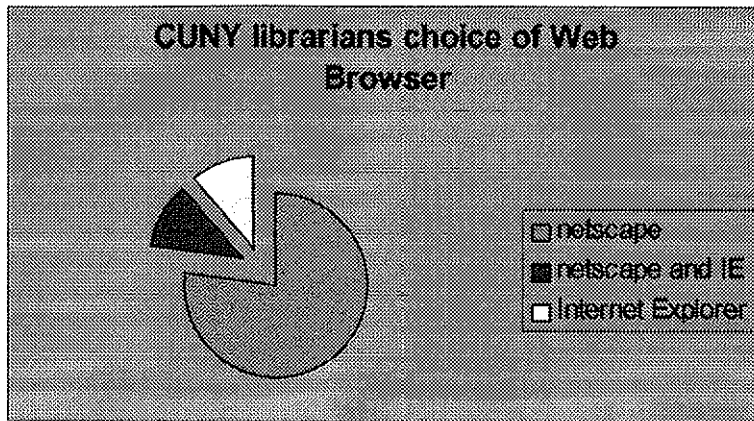
A limitation of the study was not including metasearchengines. Twenty-five people included metasearchengines on the survey. The two most popular metasearchengines were dogpile and metacrawler. The researcher never even heard of dogpile before this survey was administered. This is an example of learning from one's experiments.

Below, the findings of last page's tables are graphically displayed.



Question number 7: Which browsers do you prefer? (circle all that apply)

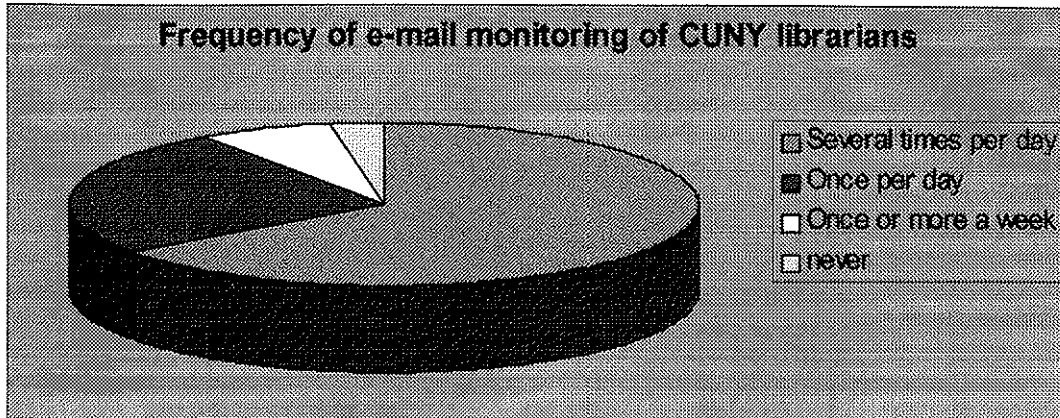
Eighty-Seven CUNY librarians chose Netscape as their Web browser of choice. Thirteen chose both IE and Netscape as their favorite browsers. Finally, only 13 people chose IE as their favorite Web Browser.



Question number 8: How often do you check your e-mail?

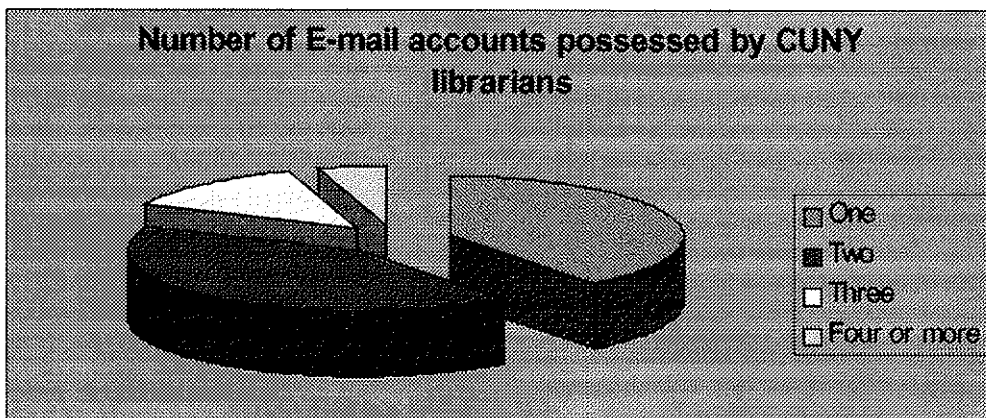
Frequency of checking E-mail	Number of librarians
Seven times per day	73
Once per day	29
Once per week	6
Less than once per week	3
Never	3

A surprising number of librarians indicate they check their e-mail seven times a day. Over one hundred of the 113 librarians check their e-mail at least once per day. These findings are shown graphically below.



Question 9: How many e-mail accounts do you have?

Most CUNY librarians have one or two e-mail accounts. Those who have one e-mail account invariably have it at work. Those who have two e-mail accounts have one at work and one at home. Those who have three or more e-mail accounts have more than one at work or home. One librarian actually had five e-mail accounts. It must take that individual a long time to check mail.



Number of E-Mail Accounts of CUNY Librarians

Number of Accounts	Number of Librarians
One	43
Two	46
Three	15
Four or More	5

Question 10: What do you do when you are online? (circle all that apply)

Online Activity	Number of Responses
Search Dialog	19
Search Lexis/Nexis	82
Search Wilson Online	34
Search Infotrac	56
Search CUNY +	96
Search Dow Jones	9
Search Gopherspace	15
Search the World Wide Web	97
Subscribe to Listservs	55
Subscribe to Usegroups	13

The information culled from this question shows that there most probably a flaw in the respondents' answers. If it is assumed that 100% of all librarians use CUNY+, this 96 figure deserves noting. This means that there are 17 people that neglected to mention

that they use CUNY+. 97 people use the World Wide Web, according to the data, this is one more person than uses CUNY+. Absurd! CUNY+ and the WWW are the two most used Internet resources.

Of the databases other than CUNY+, Lexis/Nexis is the most heavily used. It is more than four times more used than Dialog. This was very suprising! The second most used database was Infotrac, then Wilson Online, then Dialog, and finally Dow Jones. The most heavily used information resource were Listservs. Usegroups were not used anywhere nearly as much. The researcher was dumfounded that there were five times more people using gopherspace than chatrooms due to the obsolescence of gopherspace and relative newness of chatrooms.

Interpretation

The first hypothesis stating that "CUNY librarians have received their most significant technical training after their formal MLS education" has been proved definitively. Only five out of the 113 surveyed librarians indicated that they received their initial Internet training from library school. What was needed was at least 50% of respondents saying that they received their Internet training from other places than library school. There was a total of over 95% that received their initial Internet training after library school. So, it may be said that in the future, a more concentrated effort be given to high-tech training. The theory that underlay this hypothesis was that most employed librarians began their library school career before the hi-tech explosion in the 1990s. Therefore, because the 1990s and the computer boom occurred after their formal MLS education, it stands to reason that they were also trained after their formal MLS education.

The second hypothesis stated that "CUNY librarians regularly participate in continuing education to update their knowledge of electronic resources." This hypothesis was overwhelmingly proved by the fact that almost 100% of the librarians updated their Internet knowledge through a symbiosis of work and self-directed learning. The theory was that they get the training or they would be out of a job very soon. Despite the presupposition by the general public that government workers are lazy, it seems that the professional government workers such as the CUNY librarians are not at all lazy. In fact, the skills they have are very transferable to many different fields of gainful employment.

The third hypothesis stated that "CUNY librarians are actively involved in web publishing". This was proved true by the facts and figures. This question requires more depth than the others. The statement that needed to be proven true was that 25% of CUNY librarians are active in Web publishing for this hypothesis to be true. Of the librarians that graduated with their MLS up to 1990, there are 18 librarians out of 89 librarians that are active in Web publishing. From 1990 to the present there are 11 librarians out of 24 that are active in Web publishing. This means that there are a total of 20% in the group before 1990 and 45.8% after 1990. If one melds these two groups together you come up with 25% of all librarians Web publish—exactly what was needed. The theory that the librarians would be involved in the Web publishing world was hit on by the fact that some library schools are offering web publishing classes and that the professional drift of our avocation is more and more towards the electronic arena which definitely includes Web publishing.

The fourth and final hypothesis was that "CUNY librarians prefer Netscape for personal use over other browsers." The condition that needed to be tested was that over half of CUNY librarians preferred Netscape. This was proved true. 79% of all the respondents chose Netscape as their preferred browser. Where 10.5% chose both Internet Explorer and Netscape. 10.5% chose Internet Explorer as their favorite. The reasoning that underlay this hypothesis was that at work CUNY librarians use Netscape. Therefore, they would most probably be most comfortable with the browser they use most. It seems that the reasoning stood up under the rigors of testing.

CHAPTER 5 SUMMARY, CONCLUSIONS, RECOMMENDATIONS

Summary

The use of the Internet has become nearly universal among the CUNY librarians. I received one anonymous survey that stated that the librarian had no interest in learning about the Internet and that "...the Internet is particularly weak when it comes to obscure 19th century literary works". This librarian is in the minority. Most CUNY librarians are proactive when it comes to Internet literacy.

This study was undertaken to determine how CUNY librarians are using the Internet. The researcher learned that CUNY librarians are currently very actively involved with the Internet.

In summary, the sample of the year of MLS acquisition by CUNY librarians was not homogeneous; however, it generally conformed to a bell-shaped curve that was expected. The CUNY librarians differed widely over whether or not library school prepared them adequately for this "information society. The source of initial Internet training and continuing Internet training of CUNY librarians was primarily through work related experiences. Despite self-directed learning being very important in their initial and ongoing Internet training, it wasn't the major modality used. The study found that CUNY academic librarians are actively involved in Web publishing, especially if they graduated in the nineties. Altavista was the single most favored search engine by CUNY librarians. CUNY librarians overwhelmingly choose Netscape over Internet Explorer as their favorite Web browser. Over fifty percent of CUNY librarians check their e-mail more than once a day, and roughly ninety percent check it at least once per day. Most

CUNY librarians have two or fewer e-mail accounts. If they have one e-mail account, then it usually would be at work. If they had two e-mail accounts, then as a general rule they would have one at work and one at home. The three most commonly used online activities by CUNY librarians are using CUNY+, searching the World Wide Web, and searching Lexis/Nexis.

Conclusions

With all the available high-tech training options: Web Based Training, Computer Based Training, and CD-i. It was interesting to note that the most common training techniques still relied on human teaching through either mentoring or workshop experience. The investigator from the survey of related literature did not predict this outcome. The survey methodology brought to the front the fact that human teachers are still very necessary to mentor, to teach, and to guide students along a fruitful line of inquiry. With computers invading our classrooms on every level of schooling, it is interesting to know that, to this date, interaction between teacher and student is still necessary for the teacher to clarify and focus on individual student needs. No cold computer with its wiring and motherboards can yet take the place of the living, breathing entity that is embodied in the human teacher. Even the most sophisticated computers still have only the seeming intelligence of a pre-teen, so it seems that the problem solving abilities that make us so uniquely human are still needed in today's information society.

One could wax eloquent about the abilities of a computer to do billions of calculations per second, and even this glorified adding machine's power is naught compared to the simple, yet cognizant human being.

Maybe someday scientists will be able to create something that is aware of itself, and give it a soul. Biological scientists have been creating organic computers that are massively parallel. Might one of these simple biological computers gain insight into its own being? The facts are that we can clone life. Scientists have mapped out the human genome. Might we then discover the gene that gives we humans sentience and pass it along to a non-living entity? In this information age, it seems that anything is possible. Our job as librarians is to facilitate our patrons' research and for this the Internet is a powerful tool.

Recommendations

This survey brought some extremely interesting data to the researcher. The Internet usage habits were intriguing to see. It was good to see that the Internet was strongly embraced by the CUNY librarians. For further research, maybe other library systems could be looked at and surveyed. One could survey more than one academic library system and do a comparative study on how they are the same and how they differ in their Internet learning and using habits. Or, maybe medical or law libraries could be queried as to their Internet learning habits. Another thought is that public librarians might be surveyed to see how they learn and continue to learn about the Internet.

As for the CUNY library system, other hi-tech surveys might query how in-depth the other electronic resources are used, such as Lexis/Nexis. Lexis/Nexis was the most commonly used databank in the survey so it might be interesting to ascertain how proficient the librarians are at their database searching. Do the librarians know how to use the proximity operators? Do they know how to use truncation? How advanced is their knowledge of Boolean logic and can they apply their knowledge to practical searching strategies?

Also, the researcher noticed in an internship at Borough of Manhattan Community College that simple limiting solutions to CUNY+ were generally unknown or at least unused by the reference staff. So, a survey that sounded the knowledge of CUNY+ would also be a useful exercise.

One could try to see things from the CUNY librarians' patrons' perspective. How knowledgeable does the library staff seem to the uninitiated? Do the librarians answer Internet technology questions to the satisfaction of the general student body? Do the librarians make the students comfortable when they are asking basic, intermediate, and advanced Internet technology questions?

A computer scientist's opinion on what they notice concerning the librarians choices and habits may also be informative as an "outsider's" viewpoint, a fresh perspective. It would be interesting to see what the people who are building the search engines look for in their liaisons and librarians' viewpoints. The effect on librarians' position concerning the takeover of Netscape by America Online could be delved into as well.

There are as many possible subjects that may be delved into concerning the Internet and librarians as there are sites on the Internet. Each has its own unique access points.

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