Internet access and use in reference services in higher education institutions in South Africa

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Abstract

This paper is based on part of a survey that investigated the impact of the Internet on reference services. An electronic survey was conducted using the Web and e-mail to distribute the questionnaire. The target population was the heads of reference services at large libraries and the directors at smaller libraries of the 36 higher education institutions in South Africa. The response rate to the questionnaire was 28 (30.4 %); two returned questionnaires were spoilt. The following results are therefore based on the 26 (28.2%) un-spoilt completed questionnaires. These results showed that all libraries surveyed have Internet access, and all but one provided access to their users. Librarians had access to the Internet for a longer period than their users. User Internet training tended to be on a one-to-one basis at the point-of-use. The majority of librarians had attended formal Internet training programmes. While the majority of libraries had Web sites, only a small number of librarians had individual pages that they updated and maintained. The majority of libraries provided electronic reference via e-mail and the library Web site, but these were characterised by low usage. Libraries lacked adequate computer facilities and, consequently, provided

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limited Internet access to students. Librarians have integrated the Internet as an information tool, but have not fully exploited what the Internet offers.

1. Introduction

Society has progressed to the Information Age, also called the Information Society. The Information Society has been described as a society in which `the service by information and communication technologies (ICTs) underpins human activities' (European Commission, 1995). In South Africa's position paper to the Information Society and Development Conference (ISAD), recognition and high priority were given to educating and training South African citizens not only to survive but also to thrive in the Information Society (South Africa. Department of Arts, Culture, Science and Technology, 1996). Institutions of higher learning in South Africa must prepare their graduates to compete globally in the Information Society.

Internet access has become an indicator of a country's socio-economic status in the Information Society. Libraries of higher education institutions support their institutions' objective to produce graduates able to function in this society. To this end, libraries collect information resources and provide services to support teaching, research and learning. This also requires collecting and making available a number of electronic resources as the Internet brought about a revolution in `information generation, access and use' (Abdoulaye & Majid, 2000: 382). Access to the Internet has therefore become an imperative in higher education libraries.

As the Internet has become an important source of, and vehicle for information retrieval, reference librarians must be well versed in searching the Internet as well as instructing users in selecting and searching the Internet and electronic information resources available via the Internet.

This study investigated the access and use of the Internet in reference services in libraries of higher education institutions in South Africa. The aim is to describe the reference services of higher education institutions in South Africa before the

implementation of the mergers as spelled out by the Minister of Education, Kader Asmal, in 2002. The aim of this research project is to:

1. Establish to what extent students at higher education institutions have access to, and are given training on how to use the Internet in the library.
2. Assess the use of the Internet as an information tool and how well it has, or has not, been integrated with the other tools that reference librarians use.
3. Establish to what extent reference librarians possess the necessary training and knowledge enabling them to give Internet instruction and guidance to their users.

The term 'Internet' has been used to refer to both the worldwide system of computer networks and the information that is made accessible by this infrastructure (Leiner, Cerf, Clark et al, 1998). Thus, for the purposes of this study, the term 'Internet' refers not only to the system of networks, but also to the information contained, communicated and disseminated by the networks.

Higher education libraries may also be referred to as tertiary education or academic libraries. This refers to libraries that form part of educational institutions at tertiary level, such as universities and technikons. Technikons are South African institutions of higher education that provide professional and vocational programmes that are more technical and vocational in nature. They can be compared to the polytechnics and institutions of technology in other countries. At the time the study was conducted there were 15 technikons and 21 universities. The mergers, as announced by the Minister of Education, in 2002, would result in 21 higher education institutions, consisting of 15 universities and six technikons. These mergers are intended to address the imbalances between historically disadvantaged and advantaged (Department of Education, 2002). In October 2003, the Minister announced that the techikons would be designated as Universities of Technology (Department of Education, 2003).

Historically Disadvantaged Institutions (HDI) refer to those institutions that previously,

> Under Apartheid were designated to serve the various ethnic groups of the black (African, Indian and coloured) population through a restricted

> range of teaching programmes and very limited research … They consequently suffered various disadvantages with regard to funding, location, facilities and developmental opportunities. (Human Sciences Research Council, 2002)

In contrast, the Historically advantaged institutions**,** refer to institutions that were advantaged with better resource allocation, facilities, infrastructure and access to developmental opportunities and were intended to serve the white population.

Reference librarian in this study refers to all those librarians providing an information, including, librarians with subject or faculty specialization. The literature on the role of reference services is plentiful. The following is a discussion to further explore the role of the reference librarian.

According Faries (1994: 12) reference services began to develop from the 1870s. While definitions of reference work have expanded, the basic motivation has been to provide assistance to the user in finding information that s/he needs to satisfy an information query. Lynch and Robles Smith (2001) analyzed job advertisements in academic libraries between 1979 and 1998. They found that the duties of reference librarians in the early 1980s included orientation and later instruction in some job advertisements. However, by 1990 all job advertisements included instruction. Rockman (1999: 255) argues that at the end of the 1990s Web-based resources placed electronic information into the hands of end-users directly. Users are no longer dependent on reference librarians as search intermediaries. The role of reference librarian has changed from search intermediaries to `information competence teachers' (Rockman, 1999: 255). Wilson (2000) argues that with the emergence of electronic reference and 'ask-a-librarian' services, the information that was once provided at the reference desk is now being offered on the library homepage. Although the context has changed, there are two functions of references librarians that are of increasing importance in a reference service. These are training users to access and evaluate information sources, and, the `invisible function', the reference interview to identify and clarify the information needs of the user.

(Wilson, 2000: 389 – 390). Reference librarians themselves see the instruction of users and guiding users to the most appropriate sources as the current most important roles (Braun, 2002: 48).

2. Literature Review

The introduction of the computerised catalogue, the OPAC, started the electronic revolution in libraries. In the space of two decades the resources available in the library have evolved from just print based to networked CD-ROMs and dial-up access to online information services, to Web-based OPACs and databases. Libraries can therefore, offer access to information in an array of resources in both electronic and print form.

Tenopir and others conducted a series of investigations on the effect of the Internet on reference services in the United States and Canada (Tenopir & Neufang, 1992a; 1992b; Tenopir & Neufang, 1995a; 1995b; Tenopir & Ennis, 1998a; 1998; Tenopir & Ennis, 2001). While work has been done in other developing countries, such as Pakistan (Saeed et al, 2000) and Malaysia (Abdoulaye & Majid, 2000), no such investigation has been carried out in South Africa. It is important that the availability and use of the Internet in South African higher education libraries is investigated, because graduates should be prepared for an increasingly technological and electronic working environment.

In 1992 Tenopir and Neufang first reported on a survey done in 1991 among the Association of Research Libraries (ARL) in America. The member libraries consisted mostly of university libraries, with some public, government and special libraries (Tenopir & Neufang, 1992a: 23). These libraries were surveyed again in 1994, 1997 and 2000. Tenopir and Neufang (1992a; 1992b) studied these libraries to investigate what electronic information products they offered in their libraries and how these products had impacted on the work of the reference librarians. They found that all the libraries surveyed offered online intermediary, CD-ROM, and end-user searching on online and locally loaded databases. The vast majority had online catalogues. Their in-depth interviews with reference librarians revealed that the use of electronic products by their users had also increased the need for user instruction. In addition,

the instruction techniques and content of the training programmes had also changed. The librarians interviewed also reported that the perception and expectation of users had changed as a result of the immediate access users had to information. At this time the Internet was not widely used in libraries.

In 1995 Tenopir and Neufang reported on their follow-up survey conducted in 1994. The four main electronic resources used in ARL, namely, tape-loaded databases available via the OPAC, CD-ROM, end-user online and intermediary online had been expanded. The use of these electronic options by the users had increased. The majority of the libraries also offered Internet access to their users. They reported an increase in the time librarians spent on user instruction; this led to an increase in librarians' workload. At this time, Tenopir and Neufang (1995a) found that `[t]hese electronic resources are the first resort for patrons and staff, and their use has become integral to reference work'.

Tenopir and Neufang (1995b) also found that a third of the libraries were increasingly providing Internet access at all OPAC terminals. Librarians corresponded and answered queries via e-mail. Users looked for Internet access and information about the Internet in the library. Internet training for the librarians and library staff were done in a variety of ways, including an Internet training team to run Internet workshops for other library staff members. Internet training for users included dedicated training classes and informal one-to-one instruction at the point-of-use.

Tenopir and Ennis (1998a; 1998b) reported on a further survey conducted in 1997 on the impact of electronic resources on reference services. They found that the libraries surveyed had increased the number of workstations available to users. These workstations were not dumb terminals but higher-end computer and client servers. Intermediary search services had decreased, while end-user online searches increased beyond their expectation. CD-ROM and locally loaded databases were beginning to dwindle as libraries were moving to the Web version of commercial databases, or databases available remotely via consortia. Many of the libraries provided the Web version of these commercial end-user services. Almost all the libraries were also providing user access to the Web. Half the libraries provided

Internet training to remote users (Tenopir & Ennis, 1998a). Tenopir and Ennis (1998b) also found that librarians reported greater user expectations and greater job satisfaction, a greater need for instruction at every level of computer skills and a greater workload as more resources were added without an increase in the number of staff. They also reported that reference interviews took longer and that user instruction had increased.

Tenopir and Ennis (2001) reported on the 2000 survey amongst ARL libraries. They found that the majority of these libraries offered more than 100 workstations/terminals to 10 000 or more students. While most libraries still offered some resources in all formats, the preferred format was the Web, while CD-ROM was being phased out. Intermediary searches decreased both in the number of libraries offering this service and number of searches being done. The majority (90%) provided end-user searching to an increasing number of online subscription databases that offer both bibliographic and full text articles on the Web. The librarians reported that users needed help with navigating the multi-faceted databases, e.g., finding a reference on the bibliographic database and using another database or e-journal to find the full text. Instruction on how to use the Internet and online databases was an integral part of reference services, with two-thirds (44 of 70) also providing remote instruction.

The pace of change continues to be a challenge to librarians, but many feel the new technologies have given librarians greater job satisfaction and updated the image of librarians amongst users and campus administration. Tenopir and Ennis (2001: 44) found that the technologies that make real-time virtual reference possible were having the most impact on reference services in 2000. Many libraries were receiving increasingly more reference questions electronically from online reference forms, `ask a librarian' links on library Web sites, direct e-mail to the reference desk and real-time chat reference.

However, the above research was done in developed countries. South Africa is a developing country and has a history of separate and inequitable development amongst its institutions. Studies on the Internet and its impact on reference librarians

in developing countries would be more comparable. Abdoulaye and Majid (2000: 383) studied the effect of the integration of the Internet in Malaysian academic libraries on reference services in particular. They looked at the librarians' computer skills, Internet skills and training, and the use of the Internet for reference services. In addition, they explored the perceptions of the effect of the Internet on the job performance of reference librarians. They found that fewer than half of their 40 respondents from nine academic institutions had good Internet skills, more than half had Internet training, and those with good Internet skills used the Internet more frequently. The librarians they surveyed used the Internet less than 10% of their time per day to answer reference queries, and assisted users to search the Internet less than 10% of their time daily. However, Abdoulaye and Majid (2000: 388) noted that the Internet had been introduced as a tool in the reference services of these libraries only recently.

Saeed et al. (2000) investigated Internet use in the university libraries of Pakistan. They found that only half of the libraries had Internet access. These libraries used e-mail and the Web frequently. The librarians used the Internet for reference services, acquisitions, cataloguing and classification, collection development, inter-library loans and document delivery. Saeed et al. (2000: 147) also investigated the obstacles to further Internet use. They found that the universities lacked adequate computer terminals, connectivity and sufficient staff training. They also found that only two of the 20 libraries that responded had their OPAC on the Internet.

In South Africa, Herholdt (1987) studied the development of online bibliographic resource systems and services offered to library users. Swanepoel (1989) looked at the other category of electronic databases, namely, source databases and found that source databases exist in sufficient numbers in South African universities and technikons to be used as a source of information for research. Thus, while investigation into electronic databases in South Africa has been and is being done, no research has been done into the use and impact of the Internet on reference services.

3. Methodology

This study investigated what Internet facilities were offered in higher education libraries in South Africa and the impact on the reference librarians. The research was exploratory in that it aimed to gather information to create an understanding of the current situation in South African libraries with regard to Internet use. The survey method was, therefore, selected as the most suitable.

A self-administered questionnaire was used as the primary data-gathering instrument. The questionnaire was based on the instruments used by Tenopir and Neufang (1995a; 1995b).

Two weeks were spent consulting the Web sites of the 36 higher education institutions, in particular the library Web sites and pages, and corresponding via e-mail, to identify the most appropriate persons to send the questionnaire to and obtain their contact details. The most appropriate persons would be those deemed to either have or have access to the data required to answer the questionnaire, since some data would not necessarily be readily available. A total of 94 librarians were identified, consisting of heads and unit leaders of reference services, vice-directors and directors. The questionnaire was distributed to 94 librarians, 21 at the 15 technikons and 73 at the 21 universities, using e-mail. The questionnaire was posted on the Web at http://www.capewebdesign/library. The Web questionnaire page included an MS Word and plain text version that could be downloaded. The e-mail message to the potential respondents inviting them to participate included the URL of the Web version of the questionnaire and included the MS Word and plain text version as attachments.

The questionnaire was divided into six sections. Each section dealt with a specific sub-area of the librarians' work. Five of the sections included an open-ended question at the end of the section giving respondents the opportunity to add anything further pertaining to the particular topic the sections dealt with. It also provided the respondents with the opportunity to qualify questions they may have perceived as ambiguous. The rest of the questions were close–ended, structured questions. According to Powell (1991: 87), the fixed response options take less time to answer

and thus discourages non-response. This format was chosen to increase the response rate by making it easier to complete the questionnaire. This format also increases reliability because there is less variation between responses (Powell, 1991: 88). The structured questions also facilitated the analysis of the questionnaire.

Respondents were given a two-week period to respond. After the two weeks, a reminder message, with another two-week response period was given to those who had not yet responded. A final total of 28 questionnaires were returned via electronic mail, fax or submission from the Web. Two members of the sample population, one from a technikon and one from a university, could not be reached by e-mail despite using the most recent contact e-mail addresses. Further investigation to discover the contact details, during the period that the survey was conducted, proved fruitless. These two were thus excluded from the survey. This yielded a response rate of 30.4% from 92 potential respondents. Two returned questionnaires were spoilt and could not be used.

The responses were composed of 18 university and seven technikon library respondents, and one of unknown type. It was possible to have more than one response from an institution. The following figures represent the response for individual institutions: 13 universities were represented, of a potential of 20 universities; and seven of a total of 14 technikons were represented. Thus, the response represented 20 institutions (or 21 with the response of the unidentified institution) of the possible 36 institutions in South Africa. This yielded a response rate of 58.3% from individual academic institutions. Eight (30.8%) of the 26 respondents were from HDIs.

The low individual response rate is typical of electronic surveys. While there are many benefits to electronic surveys, several studies have found the response rates of electronic surveys are lower than traditional mail surveys (Schaefer & Dillman, 1998; Sheehan & McMillan, 1999; Cook, Heath & Thompson, 2000; Shannon & Bradshaw, 2002). Since the respondents in this study had already had a reminder and another two week period to respond, further follow-up via telephone were considered to be intrusive and harassment. Instead, interviews were conducted with reference

librarians in the Western Cape. The results of the interviews are however, not discussed in this paper.

4. Results and discussion

This study aimed to explore the extent to which the Internet is accessible to and used in South African higher education libraries by reference librarians and users. The results were analysed to discover access, use and training of the Internet to users in higher education libraries, and the access, use, training of reference librarians and assistance to users.

In the analysis the median average of the distributions were used to describe the central tendency because it gave a truer reflection of the middle value and distribution.

4.1. User Internet Access

All but one of the 26 respondents provided Internet access to their users. Table I below illustrate the responses to how long the respondents' libraries had provided access.

Table 1. Period of User Internet Access

No. in years	No. of respondents	Percentage	Cumulative percentage
0 -0.9999	2	8.00%	8.00%
1 -3	11	44.00%	52.00%
4 -6	11	44.00%	96.00%
7 -9	1	4.00%	100.00%
10 -10	0	0.00%	100.00%
11 Or More	0	0.00%	100.00%
	25	100%	

Using the figures above, the median average number of years that the 25 provided access in their libraries is 2.9 years at the time the data was collected. The one

respondent who indicated no access, as well as the two that indicated less than a year were from HDIs. Three of the 11 that indicated one to three years and only two of the eleven than indicated Internet user access for four to six years were HDIs. Thus, only two HDI's in this study had access for longer than this study's median average of 2.9 years.

The above results compares well to the results of the 1997 study of Tenopir and Ennis (1998a). In their study of 68 ARLs in the United States and Canada, they found that only two of the libraries did not support end-user access to the Web. In an earlier study, Tenopir and Neufang (1995b) conducted in 1994, they found that 77% (74 of 96) ARL libraries provided user Internet access. In the space of three years, therefore, they found a 30% increase in user Internet access in ARL libraries.

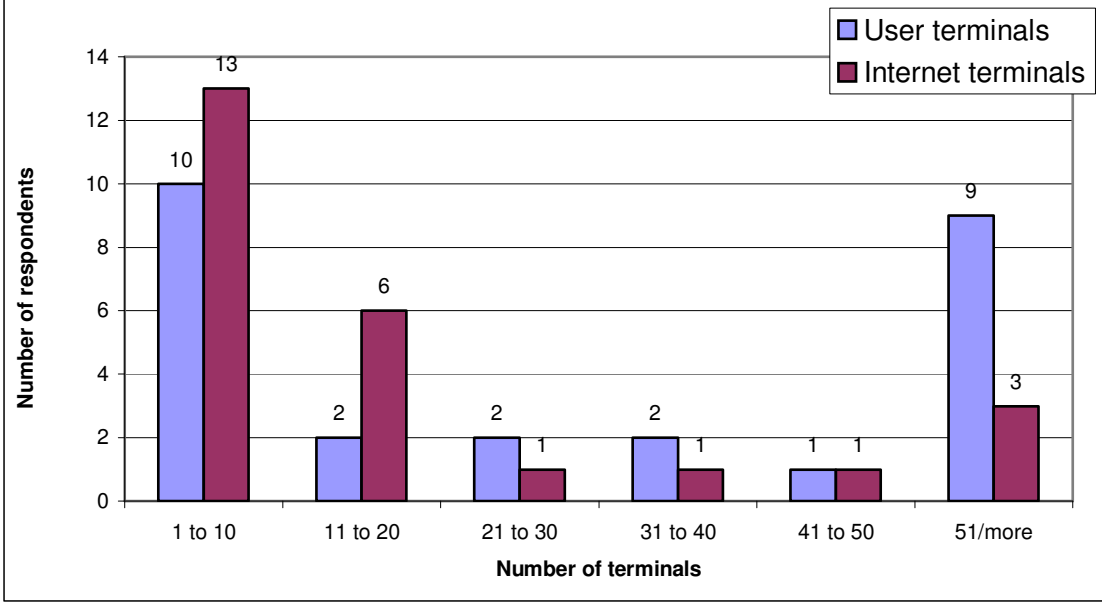
The majority of the respondents in this study provided free access to the Internet to all the students and staff. Table 2 below indicates the size of the student population that libraries provided a service to.

Table 2. Size of Student Population

No. of students	No. of respondents	Percentage	Cumulative percentage
0 -5000	4	15.38%	15.38%
5000 -9999	9	34.62%	50.00%
10000 -19999	12	46.15%	96.15%
20000 -29999	0	0.00%	96.15%
30000 Or More	1	3.85%	100.00%
	26	100%	

Of the nine respondents that indicated 5 000 to 9 999 students, five were HDIs, and three of the four respondents who indicated less than 5 000 students were from HDIs. The median average number of students of the 26 respondents is 9722.2 students. At least four of the HDI respondents therefore had less students than the median average.

Figure 3. Number of user terminals and Internet terminals



The number of user terminals with Internet access was generally less than the number of user terminals. Just over half (13 or 52%) of the libraries that provided access, did so from all the user terminals in their library. Tenopir and Neufang (1995b) found in their 1994 study that one third of the libraries surveyed were providing access at all their terminals. While their study was done six years prior to this study, it was conducted in Canada and United states; both are developed countries. By contrast, South Africa is a developing country and has a history of inequitable resource allocation to overcome in 17 (47.2% of 36) higher education institutions. Of the 13 (52% of 25) that provided Internet access at all their workstations, five (38.5% of 13) respondents indicated their library have between one to ten users terminals and all five were from HDIs. These five constitute 62.5% of the eight HDI respondents. Three of the five HDI respondents had less than 5 000 students.

The respondents in this study provided a median average of 23.5 terminals/workstations and 10.2 Internet terminals/workstations to a median average student population of 9 722.2. This yields a proportion of one user terminal/workstation for every 413.7 students and one Internet terminal for every

953.2 students. Similarly, the study of Saeed et al's (2002: 157) study of 20 university libraries in Pakistan found that one of the biggest obstacles in the wider use of the Internet was the lack of adequate computer terminals. Tenopir and Neufang (1995b) reporting on their 1994 study found the lack of adequate workstations for users as one of the biggest problems since the introduction of the Internet. However, in the 2000 study of 70 ARL libraries, Tenopir and Ennis (2001: 41) reported that the majority of libraries provided more than 100 terminals to 10 000 or more students. This yields a proportion of one terminal to 100 users.

Apart from dedicated Internet terminals, respondents reported that users also had access via librarians, OPACs or computer rooms or a combination of these. Respondents also indicated a high demand for Internet facilities, but scarce resources plagued libraries. An alarming comment by one of the respondents was that, `It is difficult to influence or motivate such a [Internet] service to university management when they don't see the need for the university to provide Internet access for the students.' In order to provide access to users despite lack of resources librarians: intermediated access for users, limited access to online subscription databases and e-journals, provided terminals with either only database access or only Internet access, or provided separate workstations for undergraduates and graduates, or restricted use to set periods of time.

However, two respondents reported that new facilities would be in operation during 2002 providing computer and Internet facilities. Funding for both was coming from the European Union/Department of Education Library programme.

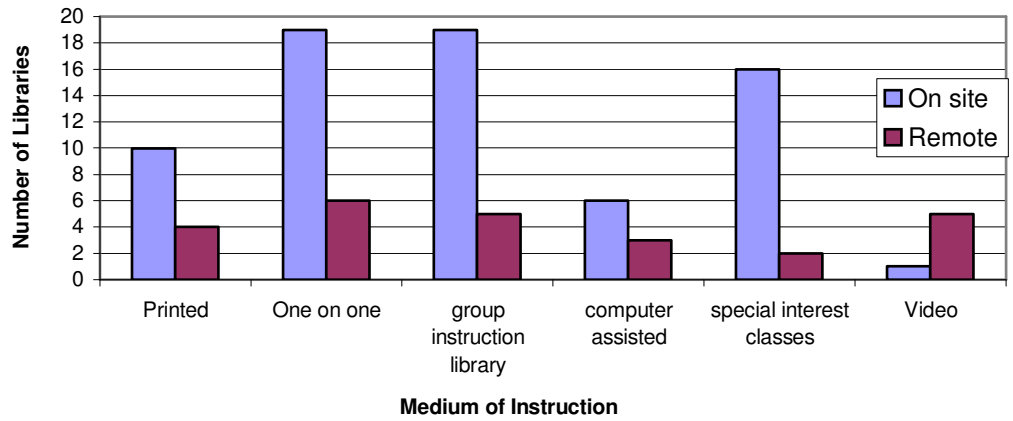
At the time the study was conducted, not all users had access to the Internet at libraries in South African universities and technikons. Libraries do not have sufficient user computer workstations/terminals for the optimal use of the Internet.

4.2. User Internet Instruction

All but three of the 25 libraries offered training on the Internet to on-site users. Only ten (40%) of the 25 libraries offered Internet instruction to their remote users. Figure 1 illustrates the way in which instruction was offered to on-site and remote users

respectively. The results indicate that a variety of formats were used to instruct users, namely printed, computers and video.

Figure 4. On-site and Remote Instruction



However, training was provided mostly on a one-on-one basis, by group library instruction and special interest classes. The results suggest that Internet instruction was not given as part of library instruction. Remote user training was less common. Less than half, 10 (40%) provided Internet instruction to their remote users. This training was done mostly on a one-on-one basis via e-mail or online. Similarly, Tenopir and Ennis (1998a) found in the 1997 study that all but two of the 68 ARL libraries offered Internet training to on-site users. While they also found that Internet training for remote users was less common, just more than half of their respondents offered some assistance. In the 2000 ARL study, Tenopir and Ennis (2001: 42) found the situation only slightly improved with two-thirds (44 of 70) of libraries providing remote instruction. They conclude however, that remote instruction is becoming an important library service.

The trend among the libraries surveyed seems to be individual instruction at the point-of-use. The benefit of this approach is that reference librarians could customise the instruction to the specific needs of the user. However, this would be extremely labour- and time-intensive for reference librarians. This is not an efficient strategy if one considers that there are a median average of 1 369.3 students for every one reference librarian in this study.

4.3. Reference Librarians' Internet Use

The second objective of the study was to assess the use of the Internet as an information tool and how well it has, or has not, been integrated with the rest of the tools that reference librarians use daily. Two research questions were derived from this objective, namely, what did the Librarians use the Internet for, and to what extent was the Internet used in their work on a daily basis? The study investigated use of the Internet for answering reference queries, searching the open Web, online databases and Web OPAC, and assisting users. The study also investigated to what extent working on the Library Web site would impact on reference librarians.

4.3.1. Reference Librarian Internet Access

All 26 respondents reported that their reference librarians had access to the Internet. Table 3 below illustrates period of access.

Table 3. Period of Librarian Internet Access

0	-0.9999	0	0.00%	0.00%
1	-3	6	23.08%	23.08%
4	-6	14	53.84%	76.92%
7	-9	6	23.08%	100.00%
10	Or more	0	0.00%	100.00%
		26	100%	

Using the figures in the above table, the median average number of years that librarians have had access in this study is 5.2 years. The respondent of the HDI library that does not provide Internet user access at user terminals, are one of four HDI respondents that indicated librarian Internet access for four to six years. The other four HDI respondents indicated their librarians had access from one to three years. None of the HDIs indicated Librarian Internet access for seven to nine years.

However, the fact that all of the librarians in this study had access to the Internet compares very favourably to a study of Saeed et al. (2000: 156). The latter was conducted in Pakistan's university libraries and found that among the 20

respondents, half did not have Internet access, although the Internet had been introduced into Pakistan's non-commercial institutions in 1995.

4.3.2. WEB OPAC Use

Six (23.1%) respondents indicated no Web OPAC version in their libraries; eighteen (69.2%) were using a Web OPAC.

Table 4. Reference Librarian OPAC use

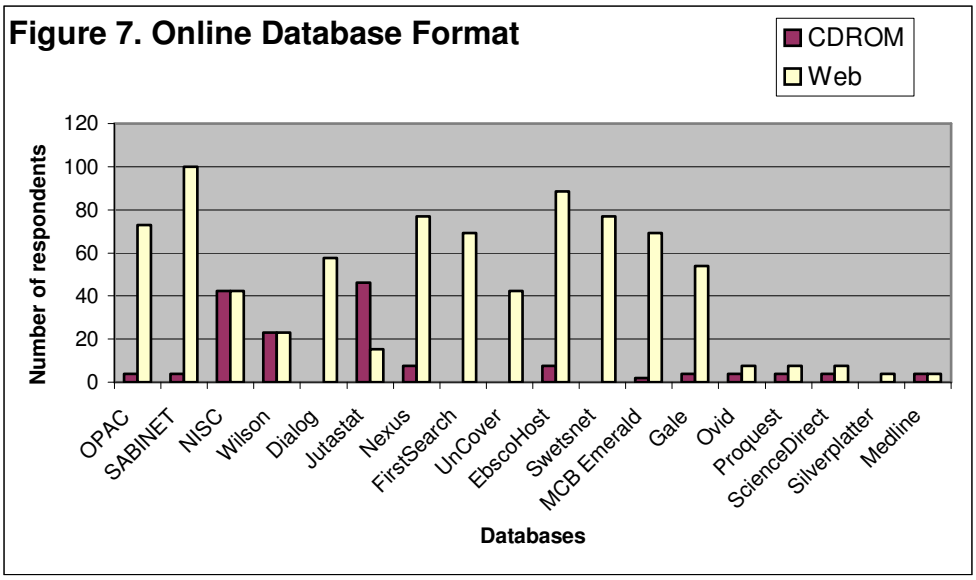
Times per day		No. of respondents	Percentage	Cumulative percentage
0	0	6	33.33%	33.33%
0.1	-1	3	16.67%	50.00%
2	-5	0	0.00%	50.00%
6	-10	1	5.56%	55.56%
11	-15	2	11.11%	66.67%
16	-20	2	11.11%	77.78%
21	Or More	4	22.22%	100.00%
		18	100	

Four of the six respondents were from HDIs. Eight respondents indicated that such data was not collected. Table 4 above indicate the distribution. The median average of reference librarian OPAC use is 7.25 times per day.

4.3.3. Online databases

All the libraries in this study had Web access to the online subscription databases. Web access to all the databases, including the OPAC, was the dominant way in which access was provided to databases; in some cases Web access was the only access to the database. Figure 7 illustrates the access format of online subscription databases.

Figure 7. Online Database Format

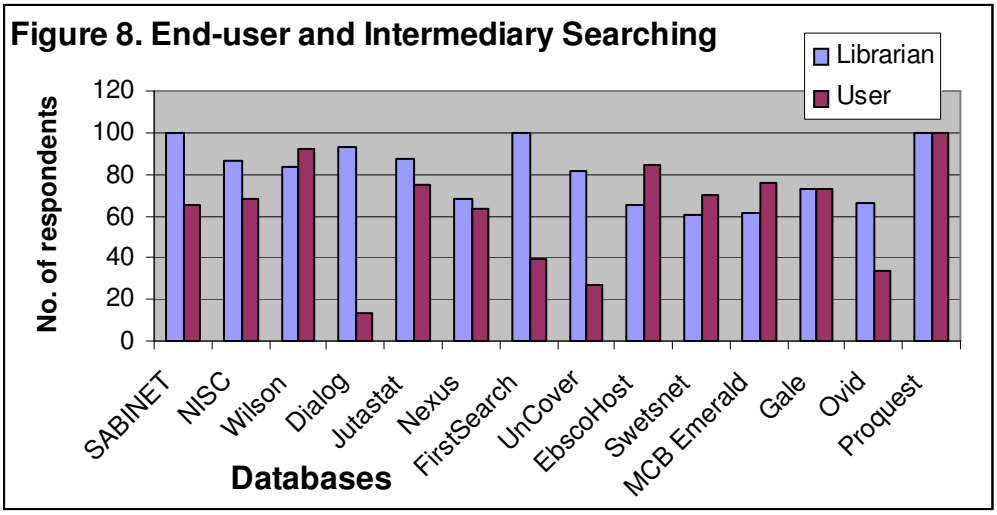


SABINET was offered by all the libraries, closely followed by EbscoHost, then Swetsnet and Nexus; and then MCB Emerald and OCLC Firstsearch. Moreover the preferred mode of access was the Web, with the sole exception of Jutastat, where the majority of the libraries had CD-ROM access. Thus, the Internet was being used to access all information sources in the majority, 18 (69.9%), of the libraries in this study. The reference librarians could therefore be spending the majority of the time using the Internet to access or search for information because the resources were accessed on the Web.

It appears that the Web based databases are the preferred format and CD-ROM databases are no longer the first choice in this study. While many libraries still have CD-ROM databases, as Tenopir and Ennis (1998a) concluded, the trend is to replace CD-ROM databases with online databases on the Web. The main reasons are that the burden of loading and maintaining the databases in terms of the technical problems and requirements, relieves pressure on systems staff and maintenance costs, and online databases overcome the limitation of CD-ROM in the amount of material it can provide, particularly because users want the full text of everything (Tenopir & Ennis, 1998a).

4.3.4. End-user vs Intermediary Searching

From the results it appears that libraries offer both intermediary and end-user searching to their users. All of the respondents indicated end-user searching for SABINET. Nineteen (73%) of the respondents indicated end-user searching for FirstSearch and NISC, respectively. Twenty–two (84.6%) of the respondents indicated end-user searching on Ebscohost, followed by Emerald with 18 (76.2%) and Swetsnet with 12 (60%). Figure 8 illustrates the type of searching being conducted on the online databases.



The libraries surveyed tended to offer mediated rather than end-user searching for the online databases, with five exceptions, namely, EbscoHost, Swetsnet, MCB Emerald, Gale Infotrac and Wilson. The tendency to provide mediated searches for the online databases may be ascribed to, as with the user access to the Internet via librarians, insufficient facilities. If there are not enough user workstations, making a number of online databases available on these workstations may prevent other users from doing a simple query to find books on the library OPAC. Therefore it would make sense to rather provide the online databases via librarians who can execute a search faster. This is in contradiction to the findings of all the ARL studies that showed a decreasing number of mediated searches and an increase in end-user searching (Tenopir & Neufang, 1995; Tenopir & Ennis, 1998a). The most recent study showed that 90% of the ARL libraries offered end-user searching (Tenopir & Ennis, 2001: 44).

EbscoHost, Swetsnet and MCB Emerald databases are among the databases that were offered in the majority of the libraries as Web accessible. The Web versions of the online subscription databases are designed with the end-user in mind (Tenopir, 1998). Therefore, the fact that these databases were accessed on the Web may be a contributing factor in making these databases available to users as end-user search databases. EbscoHost is also part of the Electronic Information for Libaries (EIFL) project, which made this database available to higher education libraries at a much-reduced cost.

4.3.5. Open Web Use

All respondents indicated that the reference librarians used the Internet to answer reference queries. Librarians used the Internet mainly for on-site ready reference, and for queries received via e-mail, but also for database access, e-mail and search engine use.

Respondents were asked how often the reference librarians used the Internet excluding the OPAC and subscription databases. Librarians in this study used the Internet, excluding OPAC and database, on a median average of 5.6 times per day to answer reference queries. Table 5 below illustrates the distribution.

Table 5. Open Web Use

Times per day		No. of respondents	Percentage	Cumulative percentage
0	-0	0	0.00%	0.00%
0	-1	0	0.00%	0.00%
2	-5	12	46.15%	46.15%
6	-10	5	19.23%	65.38%
11	-15	0	0.00%	65.38%
16	-20	3	11.54%	76.92%
21	Or More	6	23.08%	100.00%
		26	100.00%	

Abdoulaye and Majid (2000: 385) reported a higher of 6.74 queries answered per day using the Internet. The difference in the figures may be due to better Internet training for users, which means that they do not require or ask for assistance. However, it could also be attributed to either a lack of Internet knowledge and searching skill amongst librarians in this study. Conversely, it could also be an indication of the expertise of librarians in this study. Stover (2000: 45) found in his study that librarians "insist on using professional judgement in determining the appropriate response to a reference query." Librarians in this study may not consider the Internet as the best source for answering many of their reference queries and therefore do not use it more frequently.

4.3.6. Electronic Reference

Table 6. Electronic queries

	Queries answered by e-mail			**Web site generated queries**		
Times per day	**No. of respondents**	**Percentage**	**Cumulative percentage**	**Web queries**	**Percentage**	**Cumulative percentage**
0 -0	6	23.08%	23.08%	4	30.77%	30.77%
0 -1	6	23.08%	46.15%	5	38.46%	69.23%
2 -5	12	46.15%	92.31%	0	0.00%	69.23%
6 -10	2	7.69%	100.00%	2	15.38%	84.62%
11 -15	0	0.00%	100.00%	0	0.00%	84.62%
16 20	0	0.00%	100.00%	0	0.00%	84.62%
21 Or More	0	0.00%	100.00%	2	15.38%	100.00%
	26	100.00%		13	100.00%	

Up to five (19.2%) of the respondents did not offer an e-mail reference service. In this study, librarians answered a median average of 2.2 queries a day. Just over half, 13 (54.3%) indicated that the library Web site generated reference queries; a median average of 3.6 queries were received per day. The literature on electronic reference

reports low volume of use of these electronic services. Schneider (2000: 96) reports `several dozen questions a month' received by e-mail. Similarly, Stormont (2001: 132) reports that 12 to 15 questions a week, an average of two per day, in the first six weeks of their service at Temple University and an average of 20 to 35 questions a week later. However, low usage reported in these services was due to lack of proper promotion of the service (Oder, 2001: 48). Libraries that would like to increase or offer an electronic reference service should therefore promote and market such services.

4.4. User Assistance

To determine the extent of the impact of user assistance with Web–based tools and the open Web, and whether users still require assistance with Web-based tools, respondents were asked how often user asked for assistance with the Web OPAC, Online Web databases and the open Web, respectively. Figure 7 below illustrate the responses.

Six respondents reported not having a Web OPAC, as reported earlier. Seven did not collect such data. Seven respondents do not collect data on database user assistance. One respondent indicated that users do not use the online databases. This respondent is from an HDI. The respondent indicated that Web based databases are new in their library and the librarians are still learning.

Two (7.69) respondents indicated that users do not use the Internet. The same respondent as above, also indicated that users do not use the Internet, even though users have access to the Internet in their library. One may argue that since the librarians are themselves still learning, they have not promoted the use of the Internet in the library. Consequently, users may be unaware that they have access. The other respondent is the respondent who indicated no user Internet access. This is also an HDI as reported earlier. Since the respondent also indicated that the librarians do the searches for users, searches on the Internet may be conducted for users when librarians, in their professional judgement, deem it necessary. Users may also have Internet access elsewhere on campus or even off campus and therefore, do not ask

for assistance in the library. The two respondents are both Technikon type institutions.

Table 7. User Assistance

		OPAC Assistance			Databases Assistance			Internet Assistance		
Times per day		No.	Percentage	Cumulative Percentage	No.	Percentage	Cumulative Percentage	No.	Percentage	Cumulative Percentage
0	0	6	30.00%	30.00%	1	5.26%	5.26%	2	7.69%	7.69%
0.1	1	2	10.00%	40.00%	1	5.26%	10.53%	1	3.85%	11.54%
2	5	2	10.00%	50.00%	3	15.79%	26.32%	12	46.15%	57.69%
6	10	4	20.00%	70.00%	4	21.05%	47.37%	4	15.38%	73.08%
11	15	0	0.00%	70.00%	2	10.53%	57.89%	3	11.54%	84.62%
16	20	3	15.00%	85.00%	2	10.53%	68.42%	2	7.69%	92.31%
21	Or More	3	15.00%	100.00%	6	31.58%	100.00%	2	7.69%	100.00%
		20	100.00%		19	100.00%		26	100.00%	

The median averages for user assistance with the OPAC is 5.38, with the online databases 11 and with the open Web 5.17 times per day. Abdoulaye and Majid (2000: 385) found a higher average of 9 requests for assistance with the open Web daily.

The median average for assistance the Internet and the OPAC are close. The median average for assistance with online databases is a little more than the two combined. Users are asking for assistance with the Internet as least as often as the OPAC and assistance with online databases twice as often as the OPAC.

The Internet has therefore not done away with the need for user assistance. Instead it is another tool that users need assistance with. Furthermore, while respondents report in the open ended questions that they are seeing more users who are

confident with using the advance technology and do not want the help of librarians, some users do not have basic computer skills.

Tenopir and Ennis (1998b) also found that many users still need basic computer literacy instruction before the advanced aspects of search strategy can be included. Users who are computer literate needed guidance to the most appropriate resources and assistance with using the databases, because of variety and sophistication of search interfaces. Even when users can search the different databases, they need librarians to synthesise the information, to make sense of it because they get lost in the mass of information. For this reason librarians found it necessary to intensify and increase the variety their instruction. These instruction programmes should include critical evaluation of authority of the Web content, more guidance on search strategies and information structure (Tenopir & Ennis, 1998b).

4.6. The Library Web Site

The study also investigated to what extent reference librarians were involved in the design, maintenance and updating of the library Web site. The Web makes it possible for reference librarians to make themselves accessible in an electronic environment and to provide guidance to users, in the form of evaluated and selected subject specific Web portals or gateways, 24 hours a day, seven days a week. This is a way in which to integrate the Internet with the reference librarians' work that goes beyond using the Internet as an information tool.

All but three of the 26 respondents have a library Web site. The three respondents were all from HDIs. Twenty-one (87.5%) of the 24 respondents provided access to their library catalogue and online databases from the library Web site. This compares well with the study of Saeed et al. (2000: 157) that found only 2 (10%) of the 20 responding libraries reported that their OPACs are accessible via the Internet.

Six (25%) of the 24 respondents indicated that the reference librarians were involved in the design and maintenance of the Web site and five indicated that their reference librarians were involved in updating the Web site. The majority, 17 (70.8%), of the

respondents indicated that the reference librarians did not have individual Web pages, and only seven (29.2 %) indicated that they had individual pages.

These seven (29.2%) respondents were responsible for updating them as well on a monthly, quarterly and semesterly basis. On average six hours per month were spent on updating their Web pages.

The librarians reported that although they were involved in the initial design stage, they now only provided feedback. Thus the Library web site did not impact significantly on the work of the reference librarians in this study.

4.6. Reference Librarians' Internet Training

The third objective of this study was to establish the extent to which reference librarians have the necessary training and knowledge to give Internet instruction and guidance to their users. The responses indicated various combinations of formal workshops and learning from colleagues and self–taught efforts. The majority, 22 (84.6%) of the 26 respondents, attended formal workshops. Nineteen (73.1%) were self-taught, 15 (57.7%) learned from colleagues and finally one (3.8%) learned using user guides. Respondents reported that librarians considered the formal workshops to be introductory and found it necessary to explore the Internet themselves to build their knowledge and skill.

These results are similar to Tenopir and Neufang's 1995 study (1995b: 390) that showed that there was no ongoing staff programme and that libraries relied on their regional networks and consortia for Internet instruction. As with Tenopir and Neufang's study (1995b: 392-393), the advice to libraries that are introducing the Internet emphasised the need for good training of users and also of librarians. Other advice included the provision of sufficient facilities, including printing facilities and monitoring the use by users.

5. Conclusion

Recommendations based on the results of the study include increasing the number computer facilities available to users and increasing Internet bandwidth to increase

connection speed in higher education libraries. Since this is a national problem, it should be dealt with at national government level with all the role players involved, including library directors. At library management level it is recommended that libraries take advantage of the opportunities that the Internet brings. In particular, libraries should introduce electronic reference as a core function of reference services. The current low usage of e-mail reference can be overcome by proper promotion. Libraries should also explore other electronic reference options. Libraries should increase their Internet instruction and further extend the instruction by using e-mail, online tutorials and virtual classrooms to reach more users, especially remote users.

This study endeavoured to explore Internet access and use in higher education in the pre-merger landscape. It provides a view and first step for further studies. Further user studies need to be conducted not only in the interaction between end-user and the Web, but also the interaction between reference librarian and user. An in-depth study should be conducted on the training role of the reference librarian, and the training competencies of librarians. Further investigation should be conducted into electronic reference, electronic learning support, and subject portal or Webliographies compiled by reference librarians. Many reference librarians also have a collection development responsibility. The impact of the Internet on this role should be explored.

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Appendix A: List of institutions that responded by type

Technikons	**Universities**
7 of *14 Technikons 1.Border Technikon 2.Cape Technikon 3.Eastern Cape Technikon 4.Mangosuthu Technikon 5.Peninsula Technikon 6.Technikon Natal 7.Technikon North West	13 of *20 University 8. Stellenbosch University 9. University of Port Elizabeth 10.University of Pretoria 11.Medical University of SA (MEDUNSA) 12.Potchefstroom University 13.Rand Afrikaans University 14.University of South Africa (UNISA) 15.University of Cape Town 16.University of Free State 17.University of Natal 18.University of the Witwatersrand 19.University of Venda for Science and Technology 20.Vista University

***One respondent did not identify the institution.**