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Preference and Use of Electronic Information and Resources by Blind/Visually Impaired in NCR Libraries in India

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ABSTRACT
This paper aims to determine the preference and use of electronic information and resources by blind/visually impaired users in the leading National Capital Region (NCR) libraries of India. Survey methodology has been used as the basic research tool for data collection with the help of questionnaires. The 125 in total users surveyed in all the five libraries were selected randomly on the basis of willingness of the users with experience of working in digital environments to participate in the survey. The survey results were tabulated and analyzed with descriptive statistics methods using Excel software and 'Stata version 11.' The findings reveal that ICT have a positive impact in the lives of people with disabilities as it helps them to work independently and increases the level of confidence among them. The Internet is the most preferred medium of access to information among the majority of blind/visually impaired users. The 'Complexity of content available on the net' is found as the major challenge faced during Internet use by blind users of NCR libraries. 'Audio books on CDs/DVDs and DAISY books' are the most preferred electronic resources among the majority of blind/visually impaired users. This study will help the library professionals and organizations/institutions serving people with disabilities to develop effective library services for blind/visually impaired users in the digital environment on the basis of findings on information usage behavior in the study.

Keywords: Blind/vision impaired, Electronic Resources, Internet, Information Resources, NCR Libraries

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1. INTRODUCTION

Information is a key currency in today's society with ICT as its primary means of delivery. To bridge the gap between the information rich and information poor is essential by ensuring that no one is denied access to these services due to any disability or lack of equipment that exists, in order to broach such difficulties at the point of access to ICT services (Cahill and Cornish, 2003, p.193). As the information needs of people with disabilities are similar to those of able-bodied people (Koulikourdi, 2008), libraries can act as the common platform to minimize the gap of ability and disability by ensuring an effective library service to all its patrons (Kishore, 1999). Information technology has progressed rapidly but the socially disadvantaged such as the disabled are marginalized from the benefits of information services. Today the biggest problem faced by the disabled is insufficient access to digital information services provided by libraries. Thus, the assessment of the usability of information by the disabled should be carried out to have a profound understanding of the information needs and information use behavior of the disabled to advance library information services for users with disabilities (Kwak and Bae, 2009). In this regard, the preference and use of the electronic information and resources by blind/vision impaired users to assess their specific information needs along with the impact of ICT tools/applications are the pertinent issues to this study. Thus, the present study consists of the following objectives:

1) To study the preferred source of information among blind/vision impaired users;
2) To identify the preferred Internet services/applications by blind/vision impaired users;
3) To find the influence of ICT tools/applications in the lives of People with Disabilities;
4) To explore the challenges faced by blind/vision impaired users during the use/access of the Internet;
5) To know the purpose of accessing and using e-resources among blind/vision impaired users; and
6) To determine the types of electronic resources preferred in support of work.

2. SCOPE AND METHODOLOGY

The scope of the present study possesses certain limitations as the study is limited to the National Capital Region (NCR) only and the survey population in each library is taken on the basis of availability of users during the time of the survey. The total number of 25 (=100%) users in each of the five libraries was selected as survey respondents on the basis of willingness to participate in the survey with the experience of working in digital environments. The total number of users surveyed is based on random selection and categorised as Faculty members, Research scholars, Graduates, Post-graduates, and High school and Intermediate students enrolled in various academic and vocational training courses in different institutions in the National Capital Region, Delhi (India). The National Capital Region in India refers to the metropolitan area which encircles the entirety of Delhi and adjoining urban areas. According to the National Capital Region Planning Board (NCRPB) Act of 1985, there are in total 15 districts in the three neighboring states of Haryana, Uttar Pradesh, and Rajasthan along with the National Capital Territory of Delhi that constitutes the National Capital Region (NCR) of India (NCRPB, 2010).

The data is collected through survey methods with the help of questionnaires along with the personal assistance provided to the users as and when required by them due to the different degree of impairment/disability suffered by the users (i.e. mild, moderate, severe, or complete). The accessibility and availability issues regarding the information were discussed with the experts, teachers, and disabled individuals and the questions proposed by them were included in the questionnaires prepared for the final research study. Interviews with the users with disabilities were also done to get conceptual clarity about the various issues related to disability and barriers faced by them during access of information in the digital environment. The total number of 125 questionnaires were distributed among the users i.e. 25 (=100%) in each library, out of which 80% (i.e. 20) responses are received from ADRC and HKU each, 72% (i.e. 18) each from BL and RNBT-BL, and 60% (i.e. 15) from DDCL respectively.

The survey results show that a very few faculty members (i.e. 8%) from BL, University of Delhi took part in the survey among all the libraries. The total number of Graduates (35) constitutes the major category of the users responding in the survey, i.e. 80% from ADRC, 48% from DDCL, and 12% from RNBT-BL, followed by the Post Graduates (21), constituting 40%, 32%, and 12% from HKU, BL, and DDCL respectively. Only 18 Research Scholars participated in the survey, i.e. 10(40%) from HKU and 8(32%) from BL while only 15 (i.e. 60%) High School/Intermediates from RNBTBL responded to the questionnaire.

The total five academic and special libraries were selected for the following study of blind/vision impaired people which includes:

* Amba Dalmia Resource Centre (ADRC), Miranda House
* Durgabai Deshmukh College Library (DDCL), Blind Relief Association
* Braille Library (BL), University of Delhi
* Hellen Keller Unit (HKU), Jawaharlal Nehru University
* Ram Nath Batra Talking Book Library (RNBTBL), National Association of the Blind

The data collection has been analyzed with descriptive statistics methods using Excel software and 'Stata version 11,' and presented in the form of Tables and Graphs for the goal of a clear understanding of the survey results.

3. LITERATURE REVIEW

The library profession has long championed providing services and materials to all its patrons equally, which is one of the fundamental beliefs inherent in the profession (Riley, 2002, p.179). People with disabilities are one the most important segments of society which are greatly affected by and benefit from the new technologies of the electronic age. In India, members of the National Knowledge Commission (NKC) have asked librarians 'to identify the constraints, problems and challenges to recommend changes so that necessary steps can be taken to mobilize and upgrade the existing library and information systems and services.' Hence, libraries can provide the leadership role to show their expertise and initiate new innovative means to develop and provide specialized services to these special groups who do not have access to normal services, as it is the democratic and constitutional right of differently-abled users (Roy and Bandyopadhyay, 2009, p.629). In the evolving information-based society, providing digital information services to people with disabilities has become an issue of major concern for the libraries. Today if libraries focus on offline content such as Braille books for the blind it is nothing but an anachronism (Kwak and Bae, 2009). People with disabilities are part of every demographic group imaginable. Thus, regardless of library type or location, people with disabilities represent an identifiable component of the constituency a library serves (Chalfen and Farb, 1996). As librarianship is an enabling profession, librarians need to think beyond their personal discomfort and try to provide the same level of service to this category of population as they provide to mentally capable persons (Cohen, 2006, p.62-63). The rapid growth of the Internet and its applications over traditional means of communication in terms of flexibility, speed, and reach makes it an obvious route for the dissemination of information among people with disabilities.

In a recent study, Sugano et al. (2010) states that the best resource for facilitating direct access to digital information for blind users can be 'eBraille,' a web-based translation program which easily converts Japanese text into braille documents. Moreover, it is a free system for creating braille text files for anyone who has access to a web browser. When eBraille translation accuracy was evaluated, it was found that it is equivalent to or better than the other standalone braille translation programs and it achieved the goal of being applicable for practical use.

The demand for access to the Internet by people with disabilities is steadily increasing and now it has become a human rights issue. There are several factors which inhibit the use of ICTs by people with disabilities, depending on the type of disability an individual has (Dobransky and Hargittai, 2006). Much like people with physical disabilities have inhibited keyboard use, visual impairment inhibits screen use and learning

disabilities prevent large numbers of users from participating in the benefits of the Internet and its rich resources (Cullen, 2001). Beverley, Bath, and Barber (2007) identified several factors that may affect a visually impaired person's information behavior with the help of two existing models of information behavior. Human resources and information technologies are identified as major challenges to the future of information access for people with disabilities. People with disabilities are already affected by disparities in education and income, and therefore further marginalization of their communication and information access creates a greater barrier to access to critical information needs and effective participation in a community (Baker, Hanson, and Myhill, 2009). The development of the Internet has made possible unprecedented access to information but evidence shows that people with disabilities lag behind the rest of the population in Internet use. This lower level of internet use among those with disabilities is mainly due to the fact that they have to incur the extra costs of adaptive technology for accessing the Internet (Vincente and Lopez, 2010). Another significant factor which prevents Internet use by many disabled people is the lack of ICT skills and support for them (Cullen, 2003, p.250). Huang and Russell (2006, p.162) state, "People with disability are only half as likely to have access to the internet as those without a disability." To overcome these problems, users need to receive adequate training and educational opportunities that can enhance their use of the computer and the Internet with the help of a few vital skills like evaluating search engines, choosing alternate keywords, and initiating their own searches to achieve optimal results in their quest for information (Russell and Huang, 2009).

Horwath (2002) evaluated the accessibility of four Web-based proprietary databases by blind or visually impaired who were comfortable in using the World Wide Web. Not a single database clearly emerged as completely accessible on all levels, but the Encyclopaedia Britannica Online and EBSCOhost MasterFile Elite were found to be the most accessible among the databases. The largest factor affecting ease of use and accessibility was the design of the resources themselves.

Craven and Booth (2006) present the methods and findings of two research projects that explored user behavior and usability issues relating to the use of Web-based resources by people with disabilities. Both studies provided evidence of the problems faced by disabled users when using Web-based resources. The study also revealed information about the types of features preferred by users and how they overcome navigational problems, and what types of features enhanced a user's experience. Further, both studies confirmed the importance of involving users in accessibility and usability assessments and including their feedback for the design of electronic resources.

In a more recent study, Dermody and Majekodunmi (2011) studied the impact of library databases on students with print disabilities who use screen reading technologies to navigate online resources. Users performed online searches to complete a series of tasks in three different online databases and rated Expanded Academic ASAP and Sociological Abstracts as difficult while using their screen reader to read the full text articles. The articles in PDFs were inaccessible as the PDFs were image based and were not tagged for screen readers. The amount of links on the results page in all three databases also posed a barrier and interfered with the screen readers.

In a study of website accessibility for the disabled, a sample of 33 academic library web sites were examined to study how many websites offered access to text-only versions of the databases and emphasized this access for visually impaired users. The study focused on how well academic library websites guide visually impaired people in the use of the eight larger databases including EBSCO, JSTOR, Ovid, and Proquest using two screen reading programs, JAWS (version 7.0) and WindowEyes (version 5.5). Results showed that only 5 of 33 libraries mentioned database accessibility in any way on their websites (Power and LeBeau, 2009).

The information world is rapidly changing. There is a shift in technology from analog to digital, which has resulted in a change in the availability of information resources in a variety of formats to the users. Earlier mainly printed material like books and magazines constitutes the core collection of the library but today technological advances have produced information packed in an assortment of formats, resulting in products like online databases, CD-ROMs, multimedia kits, and DVDs (Salinas, 2003). Similarly, for people

with disabilities, Braille, large print, and analog tapes are no longer the only possible formats as libraries are adding digital formats for disabled people to read text and listen to audio books. Therefore, due to the emergence of such changes in collection development with the proliferation of formats and products, libraries are challenged to plan their services with all the possible formats in mind (Epp, 2006) to derive solutions to bridge the digital divide to continue to work on the mission of providing equal access regardless of format.

The advent of the World Wide Web (WWW) and its resources has caused a dramatic evolution in academic libraries (Byerley and Chambers, 2002, p.169). Today access to electronic resources and services has been enhanced through Web-based interfaces in libraries. Library websites have evolved into information gateways providing access to various library services and resources including electronic databases, library catalogs, research tools, and the Internet (Yu, 2002, p.406). The applications of computer technology, particularly the Internet, have a strong impact on the environment of libraries. The Web provides the main channel for the dissemination of a variety of educational resources like official Web pages with administrative information, various course materials, online tutorials, and Web-mediated distance education programs. Libraries are most affected due to the digital revolution, with a great responsibility to store, organize, and provide access to the wide variety of electronic information (Schmetzke, 2001, p.35-36). Thus the main challenge for technology librarians is to be proactive in staying updated and abreast of technological advances in order to provide Web based information and services to patrons of all kinds (Vandenbark, 2010, p.28). Moreover, it is not feasible for librarians to test the accessibility of every online product they are considering for purchase, and therefore librarians must be at least aware of accessibility issues and should demand assurance from database vendors that their products are accessible (Byerley and Chambers, 2002).

Today disabled users depend very much on the web for most of their information needs and requirements. Therefore the impact of web-based resources needs to be evaluated through user-focused studies based on the user's preferences and the information seeking behavior of the user in an academic and research environment for completing their tasks successfully. In this regard, many earlier studies have been conducted to study the information needs and preference of blind/vision impaired persons for sources of information (Balini, 2000; Williamson, 1998). Also, within the last few years, similar studies have been conducted on the use and access of electronic resources by Scientists (Kumar and Singh, 2011) and Faculties and Research scholars (Madhusudhan, 2010; Tahir, Mahmood, and Shafique, 2010), but no such study on the preference and use of e-resources by blind/vision impaired users in the National Capital Region libraries of India has been conducted so far.

4. FINDINGS AND DISCUSSION

4.1. Referred Sources for Locating/Accessing Information

The use and preference of information sources differs from user to user on the basis of their needs, convenience, and availability of the information sources for them. It can be noted from Table 1 that the first source of information is 'Internet' among the majority of users in HKU (36%), BL (32%), and RNBTBL (24%) respectively. The 'College Library' is found as another important source for locating/accessing information among the majority of users in ADRC (i.e. 36%) and DDCL (i.e.28%). Also, the 'University Central/Braille Library' in HKU with 36% and 'Teacher' in RNBTBL with 24% are found to be equally important to 'Internet' as a source of information.

The above results (Table 1) clearly show that 'Internet' is the most popular source of information among the maximum number of blind/vision impaired users in all the libraries due to its easy availability (i.e. 24/7) and accessibility (i.e. with the help of assistive technology) for them.

4.2. Use of Internet Facilities by Users

The Internet enables access to vast amounts of information to be independently retrieved by users at anytime from anywhere in the world. Visually impaired users can benefit themselves with several online services and facilities like chat, email, online banking, and online reservations. According to the survey results

Table 1. Preferred First Source of Information for Users

Source of Information	Name of the Library				
	ADRC	DDCL	BL	HKU	RNBTBL
University Central/Braille Library	5(20%)	-	1(4%)	9(36%)	-
Department Library	-	-	1(4%)	-	-
College Library	9(36%)	7(28%)	3(12%)	-	-
School Library	-	-	-	-	4(16%)
Internet	4(16%)	5(20%)	8(32%)	9(36%)	6(24%)
Teacher	2(8%)	1(4%)	5(20%)	2(8%)	6(24%)
Other (i.e. colleague, seniors, etc.)	-	2(8%)	-	-	2(8%)

Note: n=25 (i.e. equal to 100%), Representative population from each Library

(Table 2), 13 (52%) respondents each in ADRC and HKU and 7 (28%) in RNBTBL use the Internet 'Everyday' at their respective libraries whereas 9 (36%) and 7 (28%) users in BL and DDCL respectively use the Internet 'Occasionally' only when the need arises for them.

When an individual with a disability uses the Internet, other users do not know that the person has a disability. Hence, Grimaldi and Goette (1999) examined the role of the Internet and its usage on the level of perceived independence among people with physical disabilities. It was found that an increase in the number of Internet services used had a positive influence on the perceived level of independence among

Table 2. Frequency of Use of Internet at the Institution/Library

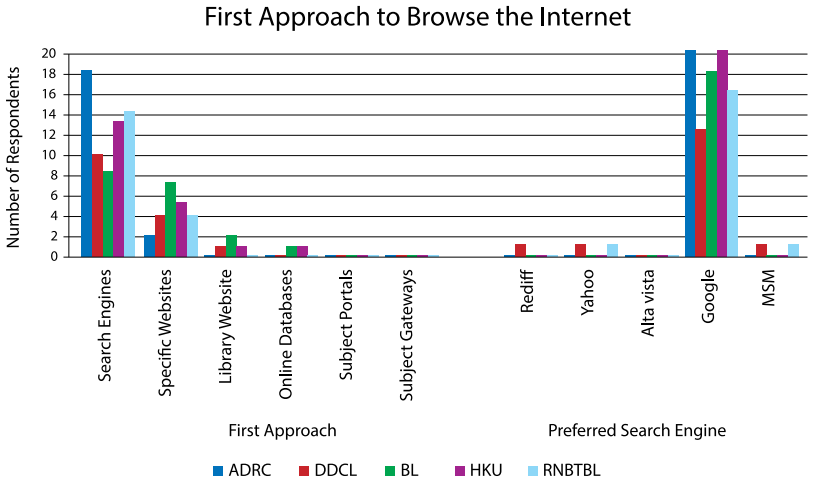
Frequency	Name of the Library				
	ADRC	DDCL	BL	HKU	RNBTBL
Everyday	13(52%)	-	2(8%)	13(52%)	7(28%)
Once a week	-	2(8%)	1(4%)	-	1(4%)
Twice a week	2(8%)	-	1(4%)	3(12%)	3(12%)
Occasionally (when need arises)	4(16%)	7(28%)	9(36%)	4(16%)	5(20%)
Never	1(4%)	6(24%)	5(20%)	-	2(8%)
Note: n=25 (i.e. equal to 100%), Representative population from each Library					
Various Reasons for Using the Internet					
It provides access to current up-to-date information	9(36%)	7(28%)	6(24%)	4(16%)	7(28%)
It provides easier access to information	4(16%)	1(4%)	4(16%)	6(24%)	5(20%)
It provides faster access to information	3(12%)	2(8%)	5(20%)	4(16%)	3(12%)
It provides access to a wider range of information	8(32%)	4(16%)	5(20%)	9(36%)	3(12%)
All of the above	1(4%)	3(12%)	3(12%)	6(24%)	4(16%)
Note: n=25, where percent exceeds 100% as users were allowed multiple responses					

individuals with physical disabilities. Also, the study revealed that usage of the World Wide Web and Telnet mainly benefits independence among users. Similarly, the present survey findings (Table 2) indicate that the majority of users, i.e. 36% in ADRC, 28% each in DDCL and RNBTBL, and 24% in BL, access the Internet as 'it provides access to current up-to-date information' for them related to their academic or research work. In HKU, a majority of users (i.e. 36%) states that they access the Internet because 'it provides access to a wider range of information' related to their academic or research work, which allows them to avoid moving around to other libraries in search of information (i.e. it reduces their mobility problem to other places). The results reveal that the majority of users in all the libraries access the Internet as it provides access to 'current up-to-date and wider range of information' for them.

4.3. First Approaches to Browsing the Internet for Information Access

The approach to browsing the Internet for information among vision impaired users depends on their awareness/knowledge about the source of information, availability, and easy accessibility of the resource, the user's requirements, and suitability of the user in finding the information. The study findings reveal that a majority of users in all the libraries, i.e. 18 (72%) in ADRC, 14 (56%) in RNBTBL, 13 (52%) in HKU, 10 (40%) in DDCL, and 8 (32%) in BL, prefer to search /access the information through 'Search Engines' as they find them easy to use. The second approach to browsing the Internet for information access among 7 (28%) users in BL, 5 (20%) in HKU, 4 (16%) each in DDCL and RNBTBL, and 2 (8%) in ADRC is through 'Specific Websites.'

Figure 1 clearly shows that 'Google' is the most preferred search engine among the majority of users in all the libraries. 20 (80%) respondents each in ADRC and HKU, 18 (72%) in BL, 16 (64%) in RNBTBL, and 12 (48%) in DDCL prefer to use only Google to browse for any kind of information from the Internet and find it more comfortable and easy to use than any other search engine.



Note: n=25 (i.e. equal to 100%), Representative population from each Library

Fig. 1 User's First Approaches in Browsing the Internet

4.4. Preferred Format for Reading Electronic Content

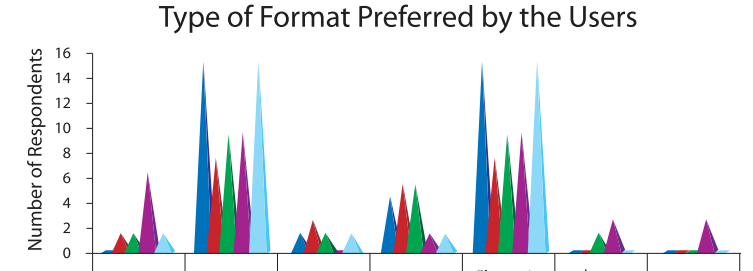
Individuals with disabilities not only require infrastructure and assistive technology facilities but also resources in accessible formats on the basis of the degree of impairment suffered by them. The survey results (Figure 2) show that the most preferred format among blind/vision impaired users is the 'Doc' format which is completely compatible with the screen readers available today and allows users to make changes and the required modifications in the data accordingly.

The results indicate that the highest (i.e. 15; 60%) number of users preferring the 'Doc' format are from ADRC and RNBTBL each, 9 (36%) are from BL and HKU each, and 7 (28%) from DDCL. The majority of users preferring 'Doc' format are completely or 100% blind. The next preferred format is 'DAISY,' which helps users to read digital document with the help of the DAISY player, which is an easily portable device. DAISY is the Digital Accessible Information System standard that was developed by an international consortium of libraries for the blind beginning in 1996 (Auld, 2005). It can be noted (Figure 2) that 5(20%) users each from BL and DDCL, 4 (16%) from ADRC, and 1 (4%) user each from HKU and RNBTBL prefer to use the 'DAISY' format for reading documents.

4.5. Preferred Internet Services/Applications by Blind/Visually Impaired Users

The Internet provides access to a variety of services and applications for users, and therefore respondents were asked to rank any three of the following Internet services/applications on the basis of their preference of use for their personal or academic purposes. As indicated below (Table 3), the highest number of users in all the libraries, i.e. 40% in RNBTBL, 36% each in ADRC, DDCL, and HKU, and 32% in BL ranked 'E-mail' as their first choice (I) on the basis of their preference of use and familiarity with the concept of Email. 'Internet browsing' was ranked second (II) by the second highest number of users in all the libraries, i.e. 44% in ADRC, 40% in RNBTBL, 32% each in DDCL and HKU, and 24% in BL respectively. Lastly, 'Downloading informative material from the Internet' was found to be the third (III) preference among 32% of users in RNBTBL and 24% of users each in DDCL, BL, and HKU while in ADRC, 28% users ranked Email as their third choice.

The high rate of involvement in 'E-mail, Internet browsing and Downloading informative material' indicates that all categories of blind/vision impaired users (i.e. Faculty members, Research scholars, Post graduates/Graduates, and high school/Intermediates)



	pdf	Doc	Text	DAISY	Electronic Braille	Large Print	Any other
ADRC	0	15	1	4	0	0	0
DDCL	1	7	2	5	0	0	0
BL	1	9	1	5	1	1	0
HKU	6	9	0	1	0	2	2
RNBTBL	1	15	1	1	0	0	0

Note: n=25 (i.e. equal to 100%), Representative population from each Library

Fig. 2 Type of Format Preferred to Read Electronic Content

Table 3. ICT-based Internet Services/Applications Accessed/Utilized by Users

Internet Services/Applications		Name of the Library				
Services	**Rank Order**	**ADRC**	**DDCL**	**BL**	**HKU**	**RNBTBL**
E-mail	1	9(36%)	9(36%)	8(32%)	9(36%)	10(40%)
	2	-	4(16%)	5(20%)	6(24%)	3(12%)
	3	7(28%)	2(8%)	2(8%)	2(8%)	4(12%)
Internet Browsing	1	3(12%)	2(8%)	1(4%)	3(12%)	3(12%)
	2	11(44%)	8(32%)	6(24%)	8(32%)	10(40%)
	3	3(12%)	-	3(12%)	3(12%)	3(12%)
Real-time chat	1	-	-	-	-	1(4%)
	2	1(4%)	-	1(4%)	-	-
	3	3(12%)	-	1(4%)	-	1(4%)
Database Searching	1	-	1(4%)	6(24%)	2(8%)	-
	2	-	-	1(4%)	3(12%)	-
	3	-	1(4%)	1(4%)	4(16%)	-
E-Journal Access	1	-	-	1(4%)	3(12%)	-
	2	-	-	-	-	-
	3	-	-	2(8%)	5(20%)	-
Downloading informative material	1	5(20%)	3(12%)	1(4%)	1(4%)	2(8%)
	2	7(28%)	2(8%)	3(12%)	3(12%)	4(16%)
	3	5(20%)	6(24%)	6(24%)	6(24%)	8(32%)
For an online course	1	-	-	-	-	-
	2	-	-	-	-	-
	3	1(4%)	-	-	-	-
Newsgroups/mailing lists/Listserv	1	-	-	-	-	-
	2	-	-	1(4%)	-	-
	3	-	-	1(4%)	-	-
Bulletin Board	1	-	-	-	-	-
	2	-	-	-	-	-
	3	-	2(8%)	1(4%)	-	-
Downloading academic/learning content provided online	1	3(12%)	-	1(4%)	2(8%)	2(8%)
	2	1(4%)	1(4%)	1(4%)	-	1(4%)
	3	1(4%)	4(16%)	1(4%)	-	2(8%)

Note: n=25, where percent exceeds 100% as users were allowed multiple responses

surveyed in the NCR libraries of India are aware of the basic communication and information aspects of the Internet. The Internet acts as the current, easier, and faster mode of communication providing access to a variety of online information resources to users to fulfill their academic and research related needs.

4.6. Impact of ICT Tools/Applications in the Lives of People with Disabilities

ICT along with assistive technology creates an adaptive environment for people with disabilities to perform various information related tasks easily. In an ICT based study for access to information services for disabled people, Myhill (2002) found that providing access to information for all users, irrespective of their physical disabilities, is a requirement for all libraries and ICT can be used to assist in this. The study describes a range of projects and services that have been developed by Gateshead libraries using ICT to provide a gateway to the wealth of information available in digital formats. Similarly, through this study it is found that a majority of respondents, i.e. 44% in ADRC and 40% each in DDCL and HKU, state that 'ICT provides various opportunities to engage them in all aspects of life including teaching and learning.' For the majority of users, i.e. 32% each in BL and RNBTBL, 'ICT helps them in communication with others via Internet applications like chat, email, online discussion groups etc.'

In addition, Table 4 clearly indicates that a majority of users in ADRC and HKU, i.e. 8 (32%) and 7(28%) in BL, believe that 'ICT has the potential for reducing the discrimination in the society.' Thus, it is found that ICT plays a major role in the lives of people with disabilities and has a positive impact on their level of independence which increases the level of confidence among them to perform various day-to-day activities.

4.7. Challenges Faced during Use/Access of the Internet

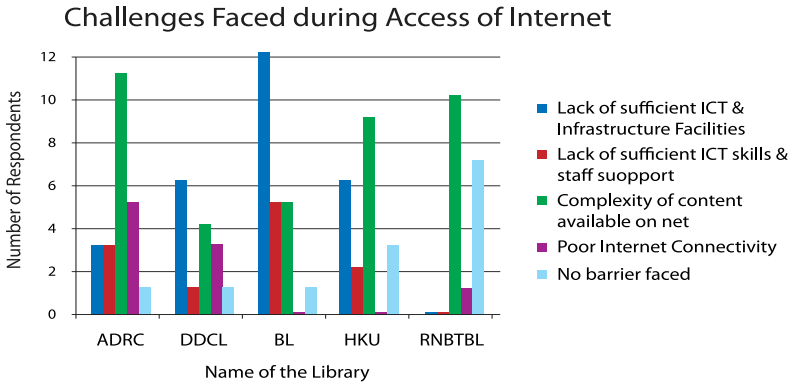
Even though the Internet provides access to a large amount of resources and facilities to blind/vision impaired users, there are various barriers faced by users during access of the Internet. The study findings (Figure 3) show that 'Complexity of the content available on the Net' is the major barrier faced during Internet use by a maximum users in ADRC (11; 44%), RNBTBL (10; 40%), and HKU (9; 36%). The 'Lack of sufficient ICT and Infrastructure facilities' in the library is found as the next major barrier faced in BL (12; 48%) and DDCL (6; 24%).

The 'Complexity of the content available on the Net' is the common barrier reported by a majority of users

Table 4. Impact of ICT Tools/Applications on the Level of Independence of Users

Role of ICT tools/applications	Name of the Library				
	ADRC	DDCL	BL	HKU	RNBTBL
ICT has the potential for reducing discrimination in society	8(32%)	3(12%)	7(28%)	8(32%)	5(20%)
ICT helps to receive specialized training to perform various information-related tasks with ease	4(16%)	7(28%)	3(12%)	4(16%)	6(24%)
ICT offers a range of specialized software and hardware solutions for communication, storage, and access of information	2(8%)	2(8%)	2(8%)	7(28%)	2(8%)
ICT provides various opportunities to engage people with disabilities in all aspects of life including teaching and learning	11(44%)	10(40%)	5(20%)	10(40%)	5(20%)
ICT helps in communication with others via Internet applications like chat, email, online discussion groups etc. with the help of Assistive Technology	7(28%)	3(12%)	8(32%)	6(24%)	8(32%)

Note: n=25, where percent exceeds 100% as users were allowed multiple responses



Note: n=25, where percent exceeds 100% as users were allowed multiple responses

Fig. 3 Barriers Faced by Users during Internet Access

in all the libraries. This includes the issue of screen design, the use of font size, color, the use of patterns in screen backgrounds that make the text difficult to read, large amount of hyperlinks, and an excess of graphics. Guidelines for accessible design and accessibility checkers are freely available on the Internet, but designers are more concerned with the 'look' of the page to sighted people than accessibility to a minority of users (Oppenheim and Selby, 1999, p.335-43).

4.8. Types of Electronic Resources Preferred by Users

One of the core values of librarianship is to ensure access to the collections that libraries builds to all users, including people with disabilities (Salinas, 2003, p.132). Awareness about the preferences of blind/vision impaired users towards these resources can play an important role in framing collection development policies in libraries for them. Libraries can work towards balancing resources with user needs which can further facilitate and enhance the use of resources among users with disabilities. The survey findings (Table 5) clearly state that Audio books on CDs/DVDs are the first (I) preferred resource among a maximum number of users in ADRC, DDCL and RNBTBL, i.e. 64%, 44%, and 36% respectively. The DAISY books are found as the most preferred resource among 48% of users each in BL and HKU. In ADRC (40%) and DDCL (28%), Audio books on Cassettes/Tapes are the second (II) preferred electronic resources among vision impaired users, followed by Electronic Text in BL (24%) and HKU (40%) and DAISY books in RNBTBL (20%) respectively.

The responses from all the libraries show that 'Audio books on CDs/DVDs' are the most preferred electronic resources among Graduates (i.e. in ADRC and DDCL) and High school and Intermediate students (i.e. in RNBTBL), followed by 'DAISY books' among the majority of Post Graduates and Research Scholars (i.e. in BL and HKU) respectively as these are easily accessible to them with the help of assistive technology. Also, 'Internet' is found as the commonly preferred electronic resource among the users in all the libraries.

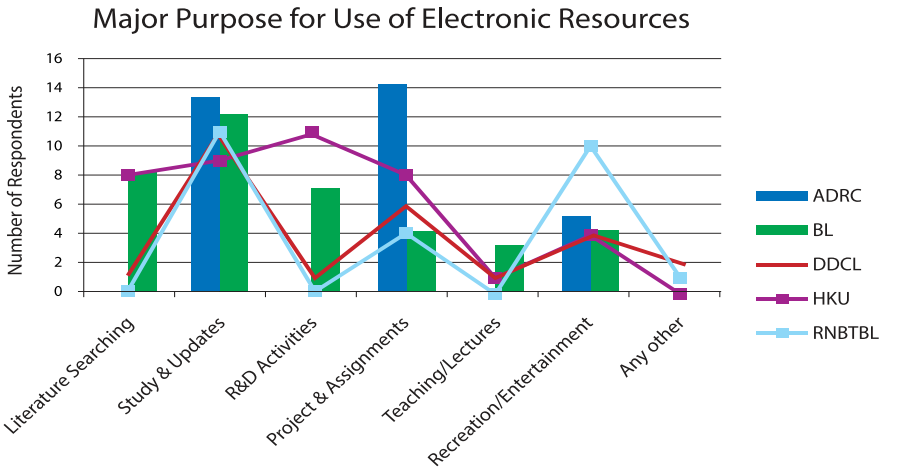
4.9. Purpose of Access/Use of the Electronic Resources by Users

Internet resources are accessed/used for different purposes by different categories of users on the basis of their academic/personal needs and requirements. The study findings (Figure 4) shows that the major purpose for which Internet resources are accessed/used is 'Study and Updates' among 12; 48% of users in BL, followed by 11; 44% users each in DDCL and RNBTBL. In ADRC, the majority (14; 56%) of users (i.e. Graduates) access/use the Internet resources for 'Project and Academic assignments' allotted to them followed by 13; 52% of users accessing the Internet resources for study and updates; whereas, in HKU a maximum of Research scholars (11; 44%) access/use

Table 5. Types of Electronic Resources mostly used by Users

Electronic Resources	Name of the Library				
	ADRC	DDCL	BL	HKU	RNBTBL
Audio books on CDs/DVDs	16(64%)	11(44%)	3(12%)	-	9(36%)
Audio books on Cassettes/Tapes	10(40%)	7(28%)	2(8%)	1(4%)	1(4%)
DAISY books (i.e. DTBs)	1(4%)	2(8%)	12(48%)	12(48%)	5(20%)
Electronic Text	4(16%)	5(20%)	6(24%)	10(40%)	2(8%)
Internet	9(36%)	6(24%)	5(20%)	9(36%)	3(12%)
Digitized Catalog (online)	-	-	2(8%)	4(16%)	-
Electronic Indexes	-	-	-	-	-
Databases of DTBs (Digital Talking Books)	-	-	-	-	-
Web-Braille System	-	-	-	-	-
Online Reference Works	-	-	1(4%)	1(4%)	-
Library Website	-	-	-	1(4%)	-

Note: n=25, where percent exceeds 100% as users were allowed multiple responses.



Note: n=25, where percent exceeds 100% as users were allowed multiple responses

Fig. 4 Purpose for which Electronic Resources are Used

the Internet resources for 'Research and Development' activities followed by 9; 36% of users who are interested in downloading and using the Internet resources for their study and updates.

The overall results indicate that 'Study and Updates' is the most common purpose among the majority of users (i.e. Faculty members, Research scholars, Post graduates/Graduates and High school/Intermediates) in all the libraries for which Internet resources are mostly accessed or used by them.

4.10. Availing of Membership of More than One Institution/Library

There are various reasons due to which blind/vision impaired users visit other libraries for the access/use of information resources apart from their parent library. It can be determined from the data represented above (Table 6) that a majority of users in ADRC, BL, and DDCL are members of other libraries also. The major reason for taking membership in other libraries by the majority of users in ADRC (44%) and BL (40%) is 'Lack of sufficient e-resources,' compared to 'Lack of proper infrastructure and facilities' in DDCL (20%). The 'lack of resources in accessible format' is found as the common reason for availing of membership in other libraries by the users of BL (40%), ADRC (20%), DDCL (16%), HKU (12%), and RNBTBL (8%) respectively.

Moreover, the majority of users in RNBTBL (60%) and HKU (48%) prefer to use their Institution/ University library only due to the sufficient number of resources and facilities available for them in the libraries. In BL and RNBTBL, few users avail of memberships for the Braille wing of the Delhi Public Library to gain knowledge on Current affairs, Biographies, or Historical background to prepare themselves for various competitive examinations and personality development.

5. CONCLUSION AND SUGGESTIONS

It can be concluded that ICT plays an important role in the lives of people with disabilities as it helps them to work independently and increases the level of confidence among them. The Internet is the preferred source for locating accessing information among the majority of the blind/vision impaired due to its easy availability (i.e. 24/7) and accessibility (i.e. with the help of Assistive Technology) for them. 'E-mail, Internet browsing and downloading informative material' comprise the preferred Internet services/applications among the users, which indicates that people with disabilities are well aware of the advanced technologies available today. The electronic resources mainly preferred by users in leading National Capital Region libraries include the 'Audio books on CDs /DVDs and DAISY' books. Blind/visually impaired patrons face various barriers during Internet access but the 'Complexity of content available on net' is found as the major barrier faced by them, followed by 'Lack of sufficient ICT and Infrastructure facilities' at the institution/library. The findings demonstrate that the majority of blind/visually impaired users avail of the information services of more than one institution /library to fulfill their information needs and requirements. The various findings suggest that blind/visually

Table 6. Availing of Services of More than one Institution/Library

Member of other Library	Reasons	Name of the Library				
		ADRC	DDCL	BL	HKU	RNBTBL
Yes	Lack of sufficient e-resources	11(44%)	2(8%)	10(40%)	5(20%)	-
	Lack of resources in accessible format	5(20%)	4(16%)	10(40%)	3(12%)	2(8%)
	Lack of proper infrastructure and facilities	-	5(20%)	8(32%)	-	-
	Lack of staff support and guidance	-	-	1(4%)	-	-
	Other	-	-	2(8%)	-	1(4%)
No		8(32%)	4(16%)	2(8%)	12(48%)	15(60%)

Note: n=25, where percent exceeds 100% as users were allowed multiple responses.

impaired people in NCR libraries are utilizing the benefits of advanced ICTs such as Internet and Email to access and use the electronic resources for 'Study and updates' to keep themselves aware of the recent advancements taking place in their subject areas.

Access to web applications is becoming an important issue for people with disabilities; therefore libraries should emphasize on the accessible web design for the disabled to access and use the various online resources and services. "Advances in technology and use of the web have provided more choices in the delivery and access to information and resources" in libraries (Craven and Booth, 2006, p.179). Today libraries and their users rely heavily on electronic resources and databases for their information needs and requirements, and therefore it is essential that these resources be made accessible to users with disabilities along with other materials. Library web sites are the digital front door to library services as they reflect the priority libraries give to their services (Power and LeBeau, 2009, p.55-56). Therefore libraries should develop a webpage/website describing the services and facilities available for blind/vision impaired users in that particular library. In this regard, Vandenbark (2010, p.26) focuses mainly on three types of Web-based resources that can be offered by a library to its user community, which are access to the Internet, access to subscription databases, and a library's own webpage/website which needs to be accessible to people with disabilities as well. Also, there are various barriers faced by the blind/vision impaired in comparison to users with other types of disabilities during interaction with the Web, which need to taken into consideration by content developers of the Web to provide necessary solutions for them. There are several standards developed for 'Web Accessibility' by the W3C (World Wide Web Consortium), especially for people with disabilities, which can be followed before Web designing. As the libraries' primary task is to meet the information needs of all users, librarians should aim to bridge the current information gap concerning accessibility of the various electronic resources so that people with disabilities may navigate the online environment on equal terms with those without any disability (Schmetzke, 2002).

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