Assistive Technologies for People with Disabilities in National Capital Region Libraries of India

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Abstract

Purpose: This paper aims to study the current status of the various Assistive Technology facilities available for the people with disabilities in National Capital Region Libraries, India.

Design/methodology/approach: Survey methodology has been used as the basic research tool to collect the data with the help of questionnaire from various institutions/libraries serving the people with disabilities.

Findings: The study depicts the lack of Assistive Technology facilities in National Capital Region libraries. The study concludes that there are negligible amount of Assistive Technology facilities for the deaf/hearing impaired and locomotor impaired users in the institutions/libraries.

Research limitation: The total number of 15 libraries was selected for the study as there were many libraries that do not have the sufficient Assistive Technology facilities to serve the people with disabilities.

Research implication: This study will prove useful for the LIS professionals and the research community to provide an insight into the current status of the Assistive Technologies available in National Capital Region Libraries, India.

Originality/value: This paper identifies the current status of the Assistive Technology facilities available for the people with disabilities in National Capital Region Libraries as there is almost no literature and research available which is relevant to this area.

Keywords: Assistive Technology, People with Disabilities, National Capital Region, Assistive Software, Assistive Hardware

Article Type: Research paper

1. INTRODUCTION

There has been an increasing recognition of abilities of persons with disabilities and emphasis on mainstreaming them in the society on the basis of their capabilities. The Government of India has enacted three legislations for persons with disabilities viz. (i) Persons with Disability (Equal Opportunities, Protection of Rights and Full Participation) Act, 1995, which provides for education, employment, creation of barrier free environment, social security, etc. (ii) National Trust for Welfare of Persons with Autism, Cerebral Palsy, Mental Retardation and Multiple Disability Act, 1999 has provisions for legal guardianship of the four categories and creation of enabling environment for as much independent living as possible. (iii) Rehabilitation Council of India Act, 1992 deals with the development of manpower for providing rehabilitation services (MSJE, 2009). It is already established that access to information is one of the most important human rights which allows the individual to develop himself/herself and participate actively within a democratic society, fully exercising his/her rights and duties (Todaro, 2005, p.253). A badly informed community or one that restricts information to an elite group, in the long term becomes a non-democratic society in which ignorance and inequality of opportunities will unfailingly lead to intolerance and discrimination among citizens (Todaro, 2005, p.254). All citizens should therefore have access to information that will enable them to be active and equal contributors and participants in society.

2. SCOPE AND METHODOLOGY

The purpose of the current study was to report the status of the Assistive technologies available in National Capital Region Libraries, Delhi, India to increase the awareness of Assistive Technology as an issue in the field of Library and Information Science and to provide an insight towards the disability issues. The main objective for conducting this research was the fact that there are no previous studies reporting on the extent National Capital Region libraries are adopting the latest assistive technologies to meet the information needs and demands of their users with disabilities. The National Capital Region in India refers to the metropolitan area which encircles the entire Delhi and adjoining urban areas. According to National Capital Region Planning Board (NCRPB) Act of 1985, there are total 15 districts in 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). In this study the term 'People with Disabilities' has been used for the people who are blind/vision impaired (i.e. total absence of sight/person with impairment of visual functioning even after treatment or standard refractive correction but who uses or is potentially capable of using vision for the planning or execution of a task with appropriate assistive device), deaf/hearing impaired (i.e. complete hearing loss/loss of sixty decibels or more in the better ear in the conversational range of frequencies) and people suffering from locomotor disability (i.e. disability of the bones, joints or muscles leading to substantial restriction of the movement of the limbs) (MSJE, 2009).

The type of organizations selected for the study includes the major institutions/libraries serving the people with disabilities in NCR region. The selection of the institutions/libraries was done on the basis of certain criteria which include: Type of collection and services available, Type of ICT infrastructure and facilities available and Type of the user community served by the institutions/libraries, etc. The total number of 15 institutions/libraries are selected for the research study i.e. 5 institutions/libraries each serving the blind/vision impaired, deaf/hearing impaired and locomotor impaired users respectively. The list of the institutions/libraries selected for the research study includes:

1. Amba Dalmia Resource Centre (ADRC), Miranda House
2. Durgabai Deshmukh College Library (DDCL), Blind Relief Association
3. Braille Library (BL), University of Delhi
4. Hellen Keller Unit (HKU), Jawaharlal Nehru University
5. Ram Nath Batra Talking Book Library (RNBTBL), National Association of the Blind
6. All India Federation of the Deaf (AIFD)
7. Daulat Ram Library (DRL), Amar Jyoti Research and Rehabilitation Centre (For Deaf/Hearing impaired users)
8. All India Deaf and Dumb Society (AIDDS)
9. Noida Deaf Society (NDS)
10. Lady Noyce Secondary School for the Deaf (LNSSD)
11. Central Reference Library (CRL), Jawaharlal Nehru University
12. Central Science Library (CSL), University of Delhi
13. Daulat Ram Library (DRL), Amar Jyoti Research and Rehabilitation Centre (For Locomotor impaired users)
14. Model Integrated Primary School Library (MIPSL), Pt. Deendayal Upadhyaya Institute for the Physically Handicapped

15. Zakir Husain Library (ZHL), Jamia Millia Islamia

The present study used survey method with the help of questionnaire along with the personal interaction with the experts of the institutions/libraries serving the people with disabilities. Assistive software and hardware facilities of the selected institutions/libraries have been analysed using Excel software by tabulated method on the basis of the data collected from the respective institutions/libraries during the survey. The total three sets of questionnaires were prepared for the type of institutions/libraries serving the users on the basis of their disability (i.e. blind/vision impaired, deaf/hearing impaired and locomotor impaired).

3. REVIEW OF RELATED STUDIES

The assistive technology plays an important role in the lives of the people with disabilities as it enhances information access and allows the user to accomplish their tasks in a more refined manner independently. The concept of assistive/adaptive technology and its role and importance in the access of information for the people with disabilities in the digital environment has been studied. There are thousands of computer based assistive aids and devices available today for the disabled and libraries are using these resources to provide services to their disabled community.

3.1 What is Assistive/Adaptive Technology?

The information age has transformed many library activities and brought an entire new group of potential patrons in the libraries which are so called people with disabilities. A properly adapted computer workstation can enhance the ability to access information displayed in digital format. The availability of alternative methods of computer input and output has freed and empowered the disabled population and opened up a new world of knowledge and power for them (Coombs, 1999, p.207). Computers in libraries are essential tools and assistive technology is the key to use them for the people with disabilities. Assistive or Adaptive Technology (AT) involves a device or a computer based accommodation that helps an individual with special needs to work around or compensate for a disability and enhancing individual ability (Goddard, 2004, p.2). Video magnifiers, electronic readers, optical character recognition software, magnification software, speech output systems and electronic Braille devices etc. all provide a solution for a particular individual with disability and these computer related aids and equipment are commonly known as 'assistive', 'adaptive', 'access', or 'enabling' technology. The combination of these technologies can be used by people to enable them to interact and work in the electronic environment. The Assistive Technology provides various means for a blind or partially sighted person to overcome several barriers such as the need to read print, use of a computer workstation, taking notes and communicating on paper and in electronic settings (Brophy and Craven, 2007, p.954-55). In simple words, Assistive technologies refer to products, devices or equipments that are used to maintain, increase or improve the functional capabilities of people with disabilities (Koulikourdi, 2008, p.387).

3.2 Role of Assistive Technology in Information Access

Assistive technologies play an important role in equalizing opportunities for people with disabilities in several aspects of life as this technology enables them to overcome various limitations and obstacles faced in all types of environments (Koulikourdi, 2008, p.387). Accessible technologies can have a remarkable effect on empowering persons with special needs

accompanied with the internet that provides great opportunity for connections to a range of people regardless of their location (Baker, Hanson and Myhill, 2009, p.48). Access to the information is major problem for the disabled but today ICT along with assistive technologies have helped to reduce the digital divide between sighted and the blind by providing information on their desktop (Koganuramath and Chowkimath, 2009, p.619).

There are numerous technologies available today for the individuals with disabilities to help them to access the printed or electronic material available in the libraries. So, there is requirement of highly knowledgeable IT and computing staff for handling this technology and creating innovative ways to apply it. The staff providing the disability services should be well aware of the needs of the students and find solutions to keep pace with emerging technologies (Berkeley, Kressin and Oberlander, 2007, p.12). In an educational context, accessibility to the courseware is an issue for the disabled learners. The accessibility of the content can be provided to them via an interface that is compatible with the various enabling (hardware/software) technologies which need to run in conjunction with the courseware program. The functionality of the interface includes navigation, searching, indexing, bookmarking and note-taking (Vincent, 1997).

3.3 Assistive Technologies in Libraries

In a library, Assistive technology may be as simple as a magnifying glass or it can also be sophisticated as a computer workstation with software which can facilitate user with disabilities to scan a book and hear it read loud followed with highlighted text on a monitor screen. Similarly, libraries can add workstations configured according to the needs of the specific user groups like provision of speech recognition software for the blind to control the computer or enter the text via their voices, the touch screen monitor and an electronic tracking device for those who cannot make use of standard keyboards. The libraries can create the effective assistive technology programs to find the better solutions for providing the access to the library resources and the services (Goddard, 2004). The accessible workstation allows patrons to adjust the height of the worktable and includes a movable arm for mounting the monitor so that user can tilt the display as required. An ergonomic keyboard tray and a large monitor around 20 inches or larger can also be part of the workstation which allows patrons using screen-enlarging software to see more of the displayed text while moving through the documents (Mates, 2010, p.41). Well planned technological solutions and access points based on the concepts of universal design are essential for the effective use of information and other library services by all the people (American Library Association, 2001).

New technology has opened up new areas of participation and activity for people with disabilities that were inaccessible few years ago and it is vital to ensure that users are able to use these enabling technologies (Dixon, 1996, p.65). Information can be provided to the people with disabilities if libraries can make necessary arrangements to provide their computing environments to the users for maximum utilization of electronically published materials, regardless of their abilities. There are many technological innovations taking place for the people with disabilities so librarians need to explore how people with disabilities use computer technology and what are the issues involved in using this technology for accessing the electronic information (Berliss, 1994). On the road to making libraries more accessible to people with disabilities, librarians often get stuck in technological mud. The choices are overwhelming and many librarians feel they lack the technical expertise to select appropriate equipment (Cantor, 1996, p.41). Therefore, before implementing new services to the library for the people with

disabilities, librarians need to refer to the various bibliographical sources dealing with the problems of providing library services to the disabled and to search the literature for research articles which describes the particular library's experience with the technological equipments in detail to assist them in their decision-making process (Bekiares, 1984).

Library staff should be aware of all the available adaptive technologies which address different disabilities and should know how to assist all users with library technology. The research study investigated the current use of Assistive technologies (AT) in Greek libraries and revealed there is lack of AT in Greek libraries and depicted that the current legal and regulatory framework with regard to AT is insufficient. Greek libraries are in an early stage of providing equal and effective services to patrons with disabilities. Several libraries are totally unaware and unfamiliar with concepts such as accessibility and assistive technology issues. This may be due to a number of reasons, like many AT solutions are introduced at a slow pace in Greek market in comparison with other technologically updated countries. Furthermore, they are quite expensive and do not support Greek language in order to fit to the needs of Greek education and culture (Koulikourdi, 2008). The area of adaptive technology is growing rapidly and making various assistive software applications available for the computer users with the disabilities which differ and range in functionality from simple to highly specialized, to meet the user's needs like screen reading software JAWS (Job Access With Speech), OMNI 1000 which provides the ability to scan information from a book, newspaper or magazine and have it read aloud by the screen reader, OMNI 3000 which is geared specifically to those with learning disabilities etc. But, libraries should choose only those technological solutions which are useful in the library setting. If libraries have adaptive technologies, they must advertise the fact as many users are not aware of the services being provided by the libraries for the people with disabilities (Lisiecki, 1999). It is not possible for any library to plan for every single patron's needs and selecting, installing and maintaining one or more of the most popular assistive software programs. Therefore, a study highlights five software options for the libraries which can be adopted to provide the services to the blind/vision impaired users which includes 'JAWS for Windows' from Freedom Scientific, 'Window-Eyes' screen-reading program with portable application, 'ZoomText' magnifier/reader and 'ZoomText' keyboard, 'Dragon Naturally Speaking' which is a speech-to-text engine that allows users to dictate into Windows-compatible programs, such as Microsoft Word and Outlook and last one is 'Text Aloud' which is a Text-to-Speech (TTS) software. The library staff should also consider adoption of a long-term strategy for planning for patrons with disabilities (McHale, 2007). Several other important software programs available for library patrons with blindness or visual impairments includes 'Duxbury Braille Translator'(DBT) which is very popular Braille translation program for Microsoft Windows; 'CakeTalking', a computer music and sound creation program that is compatible with SONAR; 'DocReader' which is a talking word processor; 'Reading Bar' a text-to-speech toolbar for Internet Explorer and it is multi-lingual with capability of translating Web pages; 'Connect Outloud', a program that allows users with visual impairments to access the Internet, surf the Web, send and receive e-mail and create documents using the Freedom Scientific word processor; Kurzweil 1000 another text reading software that can read both electronic and printed text that has been scanned into a computer. Text can also be modified, saved, signed or printed by the user. The software includes a calendar application, dictionary, thesaurus and spell checker (Sunrich and Green, 2006). Large print books, books on tape, books on CD, and e-books are all additional options for accessing written information that can meet the needs of certain individuals with low vision. Assistive technologies increases independence in accessing printed information in libraries therefore librarians need to

understand how computer based and non-computer based AT can assist individuals with disabilities in accessing printed information (Ethridge, 2005).

There are many special considerations which need to be made for libraries to meet the claims of equality of opportunity to all the user community. A study of libraries in the north-west of England presents their service provision to deaf and hard of hearing people with the material and technological developments such as loop systems, minicoms (text telephones), building adaptations, computer and videophone service facilities. It examines the potential of these technologies in revolutionizing the approach of deaf people in acquiring information. The considerations should be made whether the specialized equipments are used effectively by the users or not as new technology can prove beneficial for the society only when they are ready to accept that technology (Jeal, Roper and Ansell, 1996). The assistive technology services in school libraries provide new opportunities for students with disabilities to function more productively in a variety of circumstances as it improves access to information, allowing students with disabilities to independently seek out solutions to meet their own needs. There are thousands of assistive devices available today that can be applied to address a variety of personal needs, for example, users with hearing challenges can make use of various assistive listening devices, captioning features and text telephone (TTY) or telecommunication devices for the deaf (TDD). Users unable to communicate verbally can make use of portable augmentative and alternative communication (AAC) devices to speak for them. These devices allow customized programming to facilitate communication in multiple environments (Hopkins, 2004). In India, "M. K. Tata Memorial Learning Centre for Visually Challenged Students" has been set up at Sir Dorabji Tata Memorial Library, TISS in 2008 to provide innovative teaching techniques and philosophy that continues to have far-reaching effects on the lives of visually challenged and taking them to new heights of independence. The Centre has acquired latest technologies to assist visually impaired readers and presents a successful case to illustrate how bests the university library's information resources and services could be extended to its disabled user community (Koganurmath and Chowkimath, 2009). Similarly, the other libraries in India and abroad can take various initiatives to provide the similar opportunities to the people with disabilities across the country to empower them to play self-sufficient and active part in the society.

The reviewed studies reveal that the adaptive technology greatly enhance and improves the information access for the disabled but the selection of appropriate adaptive/assistive technology for the libraries among the thousands of resources available today is an issue of great challenge for the librarians. Therefore, librarians should make necessary considerations before adopting these technologies into their system by deeply examining the available research literature in the area and gaining knowledge through the experiences of the other libraries. Due to the high cost and complex nature of some assistive aids/devices, the library staff should be trained regarding particular technology before providing services to the users. The Librarians have power to minimize the gaps between the people with disabilities and the technologies as now special hardware and software are available to accommodate almost all types of disabilities to help the disabled to realize their potential and to make use of all the facilities of the library.

4. DATA ANALYSIS AND FINDINGS
4.1 How much is it important to keep updated with Latest Technological Trends?

The Library and Information Centers needs to keep them updated with the Latest Technological changes taking place in the Digital Environment to manage the resources and services of the library. In this regard, the Table 1 identifies if the Librarian/Information manager keeps them updated with the latest technological advancements taking place in the area of disability.

Table 1. Level of Importance to keep updated with the Latest Technology

Name of the Library	Level of Importance				
	Very Important	Important	Moderately Important	Of Little Importance	Unimportant
ADRC	✔	-	-	-	-
DDCL	✔	-	-	-	-
BL	✔	-	-	-	-
HKU	✔	-	-	-	-
RNBTBL	-	✔	-	-	-
AIFD	-	✔	-	-	-
DRL	✔	-	-	-	-
AIDDS	✔	-	-	-	-
NDS	-	-	✔	-	-
LNSSD	-	✔	-	-	-
CRL	✔	-	-	-	-
CSL	✔	-	-	-	-
DRL	✔	-	-	-	-
MIPSL	✔	-	-	-	-
ZHL	-	✔	-	-	-

The Table 1 clearly shows that majority of the libraries serving the people with disabilities found it to be 'Very Important' to keep them updated with the latest technological advancements taking place in the area of disability for better management of the institution/library's resources and services.

4.2 Various Assistive Software Facilities Available for the People with Disabilities

The following Table 2 identifies the various Assistive Software/s facilities available at the Institution/Library for the blind/vision impaired, deaf/hearing impaired and locomotor impaired users.

Table 2. Assistive Software Facilities available at the Institutions/Libraries

Software/s available for the Blind/vision impaired Users	Name of the Library				
	ADRC	DDCL	BL	HKU	RNBTBL
SAFA	✔	-	✔	-	✔
JAWS	✔	✔	✔	✔	✔

Window-Eyes	-	-	-	-	-
Zoom Text Magnifier/ Reader	✔	✔	✔	✔	✔
Kurzweil	✔	✔	✔	✔	✔
Multilingual/Bilingual OCR	-	✔	✔	✔	✔
Doc Reader	-	-	✔	✔	✔
Duxbury	✔	✔	✔	✔	✔
Screen Enlargement Software	✔	-	✔	✔	✔
Any other (Shruti Screen Reader/Lekha/ Sparsha for Hindi and Sanskrit Translation, Talking Typer, Maths Flash software, Fine Reader)	✔	✔	✔	-	✔
Software/s available for the Deaf/hearing impaired Users	**AIFD**	**DRL**	**AIDDS**	**NDS**	**LNSSD**
TTY emulating software	-	-	-	-	-
Dragon Dictate (convert speech to text)	-	-	✔	-	-
Big Mac (Picture Software)	-	✔	✔	✔	-
Cheap Talker (Picture Software)	-	-	-	-	-
I Communicator	-	-	-	-	-
Video Captioning Software	-	✔	✔	-	-
Software/s available for the Locomotor impaired Users	**CRL**	**CSL**	**DRL**	**MIPSL**	**ZHL**
Dragon Naturally Speaking	✔	-	-	-	-
Voice Recognition Software	✔	-	✔	-	-
On-Screen Keyboard	-	-	-	-	-
Word prediction-completion	-	-	-	-	-
Abbreviation expansion	-	-	-	-	-
I-Learn (by NIIT, India)	-	-	-	-	-

Table 2 shows that out of all the libraries, BL and RNBTBL have the maximum number of Assistive Software Facilities for the blind/vision impaired users. The ADRC and HKU have the second highest number of Assistive Software facilities available for the users. Lastly, DDCL has the lowest number of Assistive software facilities available for its users among all the libraries. Also, it can be clearly noticed from the above Table 2 that there are very few 'Assistive Software Facilities' available in the libraries for the deaf/hearing impaired and locomotor impaired users.

4.3 Various Assistive Hardware Facilities Available for the People with Disabilities

The following Table 3 identifies the various Assistive Software/s facilities available at the Institution/Library for the blind/vision impaired, deaf/hearing impaired and locomotor impaired users.

Table 3. Assistive Hardware Facilities available at the Institutions/Libraries

Hardware/s available for the Blind/vision impaired Users	Name of the Library				
	ADRC	DDCL	BL	HKU	RNBTBL
Scanner/Reader	✔	✔	✔	✔	✔
Talking Calculator	-	-	-	-	✔
Voice Recorder/CD player	✔	-	✔	✔	✔
Braille Printer/Embosser	-	✔	✔	✔	✔
Speech Synthesizer	✔	-	✔	✔	✔
Magnifying Glasses	-	-	✔	✔	✔
Any other (Tactile Image Enhancer, Single Handed Keyboard)	-	-	✔	✔	✔
Hardware/s available for the Deaf/hearing impaired Users	**AIFD**	**DRL**	**AIDDS**	**NDS**	**LNSSD**
TTY/TDD	-	-	-	-	-
Portable speech synthesizer	-	-	✔	-	-
Alarming devices/signal systems	-	-	✔	✔	-
Assistive listening system	-	-	✔	✔	-
Closed captioned decoders	-	-	-	-	-
Hearing aids/Cochlear implants	✔	✔	✔	✔	-

Hardware/s available for the Locomotor impaired Users	CRL	CSL	DRL	MIPSL	ZHL
Prosthetic and Orthotic devices	-	-	✔	✔	-
Simple/Electric Wheel Chairs	✔	-	✔	✔	✔
Walking frames/Rolators	-	-	✔	✔	-
Adaptive furniture	✔	-	✔	✔	-
Adaptive keyboards (e.g. Muppet Learning Keys, Power Pad, Unicorn Board, Touch Windows)	✔	-	✔	-	-
Speech-input devices (e.g. Voice Master)	-	-	-	-	-
Cursor-control devices (e.g. Adaptive Firmware Card, Multi-Switch Adapter Box)	-	-	-	-	-
Any other (Television/Projection)/Tricycle, Cervical Collar	-	-	✔	✔	-

Table 3 shows that out of all the libraries serving the blind/vision impaired users, RNBTBL have the maximum number of Assistive Hardware Facilities followed by BL and HKU providing the second highest number of Assistive aids/devices to the users.

It can be clearly noticed that out of all the libraries serving the deaf/hearing impaired users, AIDDS have the maximum number of Assistive Hardware Facilities followed by NDS providing the second highest number of Assistive aids/devices to the users. The Sign language interpreter is common facility available in all the libraries. The Hearing aids/Cochlear implants are available in all the libraries except LNSSD.

Lastly, out of all the libraries serving the locomotor impaired users, DRL have the maximum number of Assistive Hardware Facilities followed by MIPSL having the second highest number of Assistive aids/devices for the users. The CRL provides only Simple Wheel Chairs, Adaptive furniture and Adaptive Keyboard facilities to its users.

4.4. Status Based Rating of the Digital Infrastructure and Assistive Technology Facilities

The following data presents the rating of the library professionals to the available Digital Infrastructure and Assistive Technology facilities at the Institution/Library for serving the users with disabilities.

Table 4. Rating of the Digital Infrastructure and Assistive Technology Facilities

Name of the Library	Rating				
	Excellent	Very Good	Good	Average	Poor

ADRC	-	✓	-	-	-
DDCL	-	-	✓	-	-
BL	-	✓	-	-	-
HKU	✓	-	-	-	-
RNBTBL	-	✓	-	-	-
AIFD	-	-	✓	-	-
DRL	-	-	-	✓	-
AIDDS	-	-	✓	-	-
NDS	-	✓	-	-	-
LNSSD	-	-	-	✓	-
CRL	-	✓	-	-	-
CSL	-	✓	-	-	-
DRL	-	-	-	✓	-
MIPSL	-	✓	-	-	-
ZHL	-	✓	-	-	-

The response in the above Table 4 shows that majority of library professionals serving the people with disabilities rated their Digital Infrastructure and Assistive Technology facilities as 'Very Good'. Out of all the libraries, only HKU rated its ICT Infrastructure and AT facilities 'Excellent'. DDCL, AIFD and AIDDS rated its ICT infrastructure and AT facilities to be in 'Good' status and lastly, DRL and LNSSD found its Digital Infrastructure and Assistive Technology facilities to be 'Average'.

4.5 Inclusion of the Potential Users at the Time of Introduction of New Assistive Technology

The libraries procure the Assistive Technology for the users with disabilities without taking any prior feedback from the users which sometimes proves the wastage of the funds. The funds can be effectively utilized if the libraries include the feedback of the potential users at the time of inclusion of any new Assistive technology for them in the institution/library.

Table 5. Librarian's Perspective Regarding the Inclusion of Feedback of the Users

Name of the Library	Degree of Agreement				
	Strongly Agree	Inclined to Agree	Neither	Inclined to Disagree	Strongly Disagree
ADRC	✓	-	-	-	-
DDCL	✓	-	-	-	-
BL	-	✓	-	-	-
HKU	-	✓	-	-	-
RNBTBL	-	✓	-	-	-
AIFD	-	✓	-	-	-
DRL	✓	-	-	-	-
AIDDS	✓	-	-	-	-
NDS	✓	-	-	-	-
LNSSD	✓	-	-	-	-
CRL	-	✓	-	-	-
CSL	✓	-	-	-	-

DRL	✓	-	-	-	-
MIPSL	✓	-	-	-	-
ZHL	✓	-	-	-	-

The above Table 5, clearly states that majority of libraries are 'Strongly Agree' for the inclusion of the potential users at the time of introduction of new technology in the institution/library. In BL, HKU, RNBTBL, AIFD and CRL the library professional are 'Inclined to Agree' for the inclusion of the feedback of the users with disabilities in the introduction of new technology for them.

5.   DISCUSSION AND CONCLUSIONS

The results shows that all the 15 libraries (i.e. serving the blind/deaf/locomotor impaired users) in the study keep them updated with the latest technological advancements taking place in the area of disability for the better management of the institution/library's resources and services. Out of all the libraries serving the blind users, CRL and RNBTBL have the maximum and DDCL have the least number of 'Assistive Software' facilities for the users whereas RNBTBL have the maximum while DDCL again have the least number of 'Assistive Hardware' facilities available for the blind/vision impaired users. There are 'Very Few' Assistive Software and Hardware facilities available in the National Capital Region libraries serving the deaf and locomotor impaired users. The majority of library professionals in the libraries serving the blind and locomotor impaired users rated their Digital Infrastructure and Assistive Technology facilities to be in 'Very Good' condition while the majority of library professionals serving the deaf users rate their ICT Infrastructure and AT facilities in 'Good' condition. Lastly, majority of libraries serving the blind/vision impaired users are 'Inclined to Agree' whereas majority of libraries serving the deaf and locomotor impaired users are 'Strongly Agree' for the inclusion of the potential users at the time of introduction of new technology in the institution/library.

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