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Knowledge Resources for Visually Impaired Persons: An Indian Perspective

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1. Introduction

In the existing period, knowledge is considered the key resource for every individual in each corner of the globe; as a result its proper management in the libraries for real time delivery and use is must. As far as the academic libraries are concerned, their success relies on the ability in utilizing the knowledge of their staff to better serve the needs of the academic community for enrichment in the teaching and learning process (Wawire and Messah, 2010). Library being service institution has to look upon all the users' need, no matter which category they belong to. One of the special groups among all others is of visually impaired persons, visually impaired in a real sense is a broad term which is used widely in an educational context for the persons those who are having difficulty in seeing regardless of the nature of their impairment. According to Friend (2009), "Visually impaired is a term which is used to describe the people who are partially-sighted or completely blind". World Health Organisation (WHO, 2018) estimated that globally people with some sort of vision impairment are 1.3 billion and with mild vision impairment reach approximately up to 188.5 million. The estimate of people with ordinary to acute vision impairment is about 217, nearly 36 million people are completely blind and 826 million are with near vision impairment. It was also stated that mostly people with vision impairment are above the age of 50 years. However, around 80% of total vision impairment is considered as avoidable or curable.[1] Visual impairment imposes certain injustice demands which continuously influence the personality of the visually impaired persons. These persons suffers from number of disadvantages, deprivation is one of them. Blind persons are condoled with rather than loved and cared (Chaturvedi, 2002). Keeping the importance of this user community into consideration the present study is undertaken to investigate the knowledge resources being provided to visually impaired persons by the central universities of India.

2. National Scenario

Government of India, Ministry of Human Resource Development, Department of Education (2005) in its „Action Plan for Inclusive Education of Children and Youth with Disabilities‟ has mentioned its goal as "Recognizing Education for All children as a fundamental right, to ensure the inclusion of children and youth with disabilities in all available mainstream educational settings, by providing them with learning environment that is available, accessible, affordable and appropriate to help develop their learning and abilities."

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, it provides provisions for education, employment, creating barrier free environment, social security, etc. (ii) National Trust for Welfare of Persons with Autism, Cerebral Palsy, Mental Retardation and Multiple Disability Act, 1999 contains 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).

Higher educational sector not left behind as well, the University Grants Commission (UGC) is providing assistance to universities and colleges to inculcate the educational pattern through which persons with special needs must be able to pursue higher studies. In addition to the legal framework, substantial infrastructure has also been developed by Government of

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[1] WHO. (2018). Blindness and vision impairment. Retrieved from https://www.who.int

India for supporting and empowering its visually impaired citizens which includes National Institute of visually handicapped, Dehradun.

3. Information Access to Visually Impaired Persons

Visually impaired persons have the same information needs as their sighted colleagues are having. These people also need access to information in accessible format same as other people, and might read a newspaper, books or any other relevant document (Kavanagh, 1994). The important literary, artistic, and scientific works can be digitally preserved and made freely available to all visually impaired in every corner of the world, for education, study, and appreciation and that of all our future generations (Bhardwaj, Shukla and Yogesh, 2005). Efforts have been made for visually impaired people in progressive societies such as North America, Europe and part of Asia to facilitate inclusive access to information (Majinge, 2014).

According to Babalola and Haliso, (2011), Annichiarico (1991), Shokoff (2001) and West (1995), different alternative methods have been developed to meet the information needs of visually impaired persons all across the globe, as:

1. **Braille books:** Braille is a pattern consisting of raised dots representing letters which is used to read by touching. Braille books are appropriate source for persons having both visual and hearing impairment.
2. **Audiobooks:** Audiobooks are produced as an adapted version of the original book which is available in print.
3. **Talking books:** Talking books for the visually impaired reader are produced to reflect, to mirror the book, to be as close as possible to the original, to enhance the reading experience and to enable the reader to understand what author tried to convey.
4. **Talking newspapers:** These are audio recordings of news articles of newspapers.
5. **Large printed materials:** These are documents which are printed in large fonts, they are usually used by partially sighted users.

Visually Impaired persons are also getting benefitted with ICT advancements in assistive technologies to access information. Assistive technology is an umbrella term which covers both equipments and softwares related to the delivery of assistive products and services. An assistive technology has been specially designed to assist persons with disabilities in accomplishing their daily routine independently. Assistive technology allows people to be productive, independent as well as enable them to participate in education, which enhance their well-being and provide dignified lives. It can be said that assistive technologies are the compensatory tools for people with disabilities (WHO, 2018). Assistive technologies used by visually impaired for accessing information include screen magnifiers, screen reader, voice recognition software.

4. Review of Related Literature

Libraries have a moral obligation of providing resources to their users irrespective of their domain and they should try to find out the barriers in making use of the library resources, to resolve the problem and provide the information needed by their users rather promoting the existing library services (Saunders, 1993). The needs of visually impaired users should be provided with the help of information and communication technologies such as screen readers, braille translation software, braille writing equipment, closed-circuit television (CCTV), braille embosser and scanners, libraries must appoint trained and skilled staff so that they can teach visually impaired users how to use these technologies as well as how to read

braille (Eskay and Chima, 2013). Libraries must acquire equipment that facilitates accessibility as well as usability of information resources for their educational requirements. Audio books provide an opportunity to visually impaired students to study individually without the help of volunteer reader. Therefore, NCERT should prepare audio books which will be considered innovative and beneficial for these students (Seema, 2015). Librarians of UK were providing standard level of services to persons with disabilities as well as there were having a positive attitude towards them (Pinder, 2005) In Nigeria information services to visually impaired people were mostly provided by the Non-Governmental organisations though Nigerian libraries had also taken initiative but these libraries were not providing appropriate services to these users as the only service available was the audio books (Babalola and Haliso, 2011).

In education of visually impaired persons ICT is a blessing. It enables to overcome the shortcomings of the present education system and also to raise the education system among visually impaired people. ICT also contributes in creating social equality in nation (Balaji, 2014). Information and communication technology systems should be user-friendly so that visually impaired people can read and interact easily (Brophy and Craven, 2007). Pacelli School for the Blind & Partially sighted Children, Lagos, Nigeria library acquires a good number of collections and had proper arrangement for easy accessibility but it was suggested that they must acquire ICT equipments and assistive technologies as well as they must maintain their collection according to the curriculum (Uzohue and Yaya, 2016). Oppenheim and Selby (1999) put forth that visually impaired users face difficulty in accessing web even with the help of assistive technologies, librarians and web developers have to be ensured that their websites must be accessible to these people. The design of the websites must have compatibility with screen reader so that visually impaired people can also access them. High school and senior secondary school students at Thrivanthapuram, Kerala were computer literate and use screen readers for usually accessing online resources (Sonam and Sudhir, 2015). With the use of auditory prompt information can be enhanced by providing it in audible formats. However, copyright consideration restricts the digital form of information resources (Chelin, 1999).

Abdelrahman (2016) highlighted that library technologies and services were inadequate in the University of Khartoum, Sudan and they face difficulty while accessing information, to overcome this barrier library must arrange for training of visually impaired students as well as staff for using assistive technologies satisfactorily. Aligarh Muslim University, Aligarh provides information services to visually impaired users, develops its collection according to the demand of users and is having some in-house production of material for these users (Khowaja and Fatima, 2019). Bhardwaj (2018) highlighted that the facilities for visually impaired students in the libraries of higher educational institutions in Delhi are very basic due to which it was difficult for those students to conduct study and research with existing technological infrastructure. To facilitate efficient services these institutions did not possess the infrastructure that suited the needs of visually impaired students. Also, those libraries in Delhi were encounter the problems of funds and trained staff in providing services to visually impaired students. Problem of maintenance of assistive software and equipments, lack of awareness among the users regarding the resources and services available in the libraries were the problems mentioned by the libraries in Delhi.

5. Objectives of the study

The main aim of the study is to determine the knowledge resources provided by the central university libraries to visually impaired people in India. The study would be of immense

importance not only for the institutions under study but for whole academia especially those dealing with such user community.

The objectives of the study are as follows:

- To identify the central universities providing services to visually impaired persons in India.
- To identify the knowledge resources available in the universities for visually impaired users.
- To identify the assistive technologies acquired by the universities for assisting visually impaired users.
- To determine the Information Services provided by the Universities.
- To investigate the difficulties encountered by the Universities in providing services to visually impaired users.

6. Methodology and Scope of the Study

The study was conducted by making use of purposive sampling on the central universities of India. In total there are 49 Central universities (established under a Central Act and recognised by the UGC under the regulations of UGC Act, 1956). The evaluation of all 49 University library websites was conducted, of which 15 were providing services to the visually impaired persons. The status of the library services of the remaining 34 Universities was further verified telephonically. After making sure by both the sources 15 universities were zeroed down as a sample for the study.

Further investigator used bilateral approach for data collection which includes questionnaire and telephonic interview of librarian and library professionals heading braille section of the libraries under study. The data sets collected was based on the different parameters viz.:

- Knowledge resources available in the Universities.
- Assistive technologies acquired by the universities.
- Information Services provided.
- Difficulties encountered in providing services

Finally, the responses thus received were analysed and the results are presented in the given tables.

7. Data Analysis and Interpretation

To make it more understandable results and interpretation of the analysed data, collected from Universities is divided in respective headings.

7.1 Central Universities providing services to Visually Impaired Persons

Investigator ascertains the central universities providing services to visually impaired persons. From 49 central universities of India table 1 reveals that 15 universities are selected for the study which have initiated in providing services to this group of users.

Table 1 Central Universities Providing Services to Visually Impaired

S.No.	University	Abbreviation	Location	Year	URL
1	Aligarh Muslim University	AMU	Uttar Pradesh	1920	https://www.amu.ac.in/
2	Banaras Hindu University	BHU	Uttar Pradesh	1916	http://www.bhu.ac.in/
3	Central University of Gujarat	CUG	Gujarat	2009	http://www.cug.ac.in
4	Central University of Orissa	CUO	Orissa	2009	http://cuo.ac.in/
5	Central University of Punjab	CUPB	Punjab	2009	http://cup.edu.in/index_home.php
6	Delhi University	DU	Delhi	1922	http://www.du.ac.in/du/
7	English and Foreign Languages University Hyderabad	EFLU	Telangana	1958	https://www.efluniversity.ac.in/
8	Indira Gandhi National Open University	IGNOU	Delhi	1985	http://www.ignou.ac.in/
9	Jamia Milia Islamia	JMI	Delhi	1988*	https://www.jmi.ac.in/
10	Jawaharlal Nehru University	JNU	Delhi	1969	https://www.jnu.ac.in/

11	Mizoram University	MZU	Mizoram	2001	https://www.mzu.edu.in/
12	North Eastern Hill University	NEHU	Meghalaya	1973	https://www.nehu.ac.in/
13	Pondicherry University	PU	Pondicherry	1985	http://www.pondiuni.edu.in/
14	Sikkim University	SU	Sikkim	2006	https://cus.ac.in/index.php/en/
15	University of Hyderabad	UOH	Telangana	1974	https://www.uohyd.ac.in/

***Established in 1920 while become central university in 1988

7.2 Knowledge Resources available in the Universities

University libraries are established to cater the need of their users irrespective of their domain. Visually impaired students have special needs, special needs in context of library means users who cannot read conventional documents. As from the available literature knowledge resources which a library must possess for visually impaired persons are highlighted as well as the universities providing to their users is recorded in table 2. It was found that AMU is the only university which possess all the resources listed in the table followed by BHU, DU and JNU they possess braille books, talking books, audio books, talking newspaper, assistive technologies. CUO has assistive technologies and audio books which are only available in their regional language i.e. Odia. CUPB has braille books and audio books. EFLU has braille books, audio books and assistive technologies. IGNOU and JMI have braille books, talking books and assistive technologies. UOH has braille books and assistive technologies. SU has braille books. CUG, MZU, PU and NEHU possess only assistive technologies.

Table 2 Knowledge Resources Available in the Universities

S.No.	Universities	Braille Books	Talking Books	Audio Books	Talking Newspaper	Braille Magazines	Assistive Technologies
1	AMU	✓	✓	✓	✓	✓	✓
2	BHU	✓	✓	✓	✓	×	✓
3	CUG	×	×	×	×	×	✓
4	CUO**	×	×	✓	×	×	✓
5	CUPB	✓	×	✓	×	×	×
6	DU	✓	✓	✓	✓	×	✓
7	EFLU	✓	×	✓	×	×	✓
8	IGNOU	✓	✓	×	×	×	✓
9	JMI	✓	✓	×	×	×	✓
10	JNU	✓	✓	✓	✓	×	✓
11	MZU	×	×	×	×	×	✓
12	NEHU	×	×	×	×	×	✓
13	PU	×	×	×	×	×	✓
14	SU	✓	×	×	×	×	×
15	UOH	✓	×	×	×	×	✓

****audio books available in odia (regional language) only
✓ **Means Yes and × means No**

7.3 Assistive Equipments Acquired by the Universities

The study ascertains the assistive equipments being acquired by the libraries for their visually impaired users. It was found from table 3 that JMI is the leading university in terms of possession of equipments, it acquires total of 8 equipments viz. screen magnifiers, hand-held scanners, ruby, Digital voice recorder ICU-UX70, readlt wand, eye-c handheld video magnifiers, talking scientific calculator, Plextalk PTR2, followed by AMU and JNU they acquires 7 equipments out of the listed equipments. BHU acquires 5 equipments, DU, IGNOU, UOH and PU has 4 equipments. CUG acquire 3 equipments. MZU has 2, NEHU

and EFLU have only1equipment. CUO, SU and CUPB do not acquire any of the assistive equipment.

Table 3 Assistive Equipments Acquired by the Universities

Assistive Equipments	AMU	BHU	DU	IGNOU	JNU	JMI	NEHU	UOH	EFLU	PU	CUG	MZU
Screen magnifiers	✓	✓	✗	✓	✓	✓	✗	✗	✗	✗	✗	✗
Kurzweil reading machine	✓	✓	✗	✗	✓	✗	✗	✗	✗	✗	✗	✗
Braille printer	✓	✗	✓	✓	✓	✗	✗	✓	✗	✗	✗	✓
Zoom X scanner	✗	✓	✗	✗	✗	✗	✗	✓	✗	✗	✗	✗
Flatbed scanner	✓	✗	✗	✓	✓	✗	✗	✗	✗	✗	✗	✗
Braille Translation	✗	✓	✗	✗	✗	✗	✗	✓	✗	✗	✗	✓
Sonic guide	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗
Hand-held scanner	✗	✗	✓	✗	✗	✓	✗	✗	✗	✓	✗	✗
Voice eyes	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗
Ruby	✗	✗	✗	✗	✗	✓	✗	✗	✗	✗	✗	✗
LEX Cam scanner	✗	✗	✗	✗	✓	✗	✓	✗	✓	✓	✗	✗
SARA CE	✓	✗	✗	✗	✗	✗	✗	✗	✗	✗	✓	✗
Speech Synthesis	✗	✗	✗	✗	✓	✗	✗	✗	✗	✗	✗	✗
Digital voice recorder ICU-UX70	✓	✓	✓	✗	✓	✓	✗	✓	✗	✗	✓	✗
Reading edge	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗
Heavy lenses	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗
Readlt wand	✗	✗	✗	✗	✗	✓	✗	✗	✗	✗	✗	✗
Eye-C Handheld Video magnifier	✗	✗	✗	✗	✗	✓	✗	✗	✗	✗	✗	✗
Keyboard Overlay	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗
Braille/Talking Typewriter	✗	✗	✓	✗	✗	✗	✗	✗	✗	✓	✗	✗
Talking Scientific Calculator	✗	✗	✗	✗	✗	✓	✗	✗	✗	✗	✗	✗
Plextalk PTR2	✗	✗	✗	✗	✗	✓	✗	✗	✗	✗	✗	✗
Magnifying Glasses	✓	✗	✗	✓	✗	✗	✗	✗	✗	✗	✗	✗
Braille Embosser	✗	✗	✗	✗	✗	✗	✗	✗	✗	✓	✓	✗
Total	**7**	**5**	**4**	**4**	**7**	**8**	**1**	**4**	**1**	**4**	**3**	**2**

✓ **Means Yes and** ✗ **means No**

7.4 Assistive Software's Available in the Universities

Visually Impaired can easily access to information electronically with the help of certain software. In this regard the Universities were asked about the availability of software for visually impaired users. From the results of table 4 it is found that JMI is the leading university, with 8 subscribed software packages viz SAFA Reader, Open Book, Read Easy, Screen reader, Vaachak, Magic Pro Magnification, Talking Typing Teaching Pro and Infity reader and Chatty Infity followed by AMU which has subscribed to 7 softwares, DU has 5, JNU, PU and CUG has 4. BHU and UOH have 3 softwares. CUO have 2. IGNOU, NEHU and MZU have subscribed only1 software. EFLU, SU and CUPB does not subscribed to any of the assistive software. Universities subscribed for screen readers are having JAWS except CUO it have NVDA.

Table 4 Assistive Software Available in the Universities

Assistive Softwares	AMU	BHU	DU	IGNOU	JNU	JMI	NEHU	UOH	PU	CUG	CUO	MZU
Talk and Zoom	✓	×	×	×	✓	×	×	×	×	×	×	×
Talk Backs	×	×	×	×	×	×	×	×	×	×	×	×
Hindi OCR	✓	×	✓	×	×	×	×	×	✓	×	×	×
OBI DAISY	×	×	✓	×	×	×	×	×	×	✓	×	×
SAFA Reader	×	×	×	×	×	✓	×	×	×	×	×	×
Open Book	×	×	×	×	×	✓	×	×	×	×	×	×
Read Easy	×	×	×	×	×	✓	×	×	×	×	×	×
Lasecann	×	×	×	×	×	×	✓	×	×	×	×	×
AMIS	×	×	×	×	×	×	×	×	×	×	×	×
Pearl Instant Reader	×	×	×	×	×	×	×	×	✓	×	×	×
OBR Braille Scanning	×	✓	✓	×	×	×	×	✓	×	×	✓	✓
Kurzweil 1000	✓	✓	×	×	✓	×	×	✓	×	✓	×	×
ABBYY fine reader	✓	×	×	×	×	×	×	×	×	×	×	×
Screen Reader	✓	✓	✓	✓	✓	✓	×	✓	✓	✓	✓	×
Vaachak	×	×	×	×	×	✓	×	×	×	×	×	×
Magic Pro Magnification	✓	×	×	×	✓	✓	×	×	×	✓	×	×
Dux Bury	✓	×	✓	×	×	×	×	×	×	×	×	×
Talking Typing Teacher Pro	×	×	×	×	×	✓	×	×	×	×	×	×
Infity reader and Chatty Infity	×	×	×	×	×	✓	×	×	×	×	×	×
Image Scanner	×	×	×	×	×	×	×	×	✓	×	×	×
Total	**7**	**3**	**5**	**1**	**4**	**8**	**1**	**3**	**4**	**4**	**2**	**1**

✓ **Means Yes and** × **means No**

7.5 Information Services Provided by the Universities

Information Services are significant for studies and research, therefore, the investigator ascertains the information services provided by the universities to their visually impaired users. Table 5 revealed that IGNOU and JNU provide 9 information services followed by DU and JMI which provides 7 services. AMU and BHU provides 6 services, PU provides 5 services. UOH and CUG provide 4 services. MZU provides 3 services. CUO provides 2 services, NEHU and EFLU provides only 1 service. SU and CUPB did not provide any of the information services.

Table 5 Information Services Provided by the Universities

Information Services	AMU	BHU	DU	IGNOU	JNU	JMI	NEHU	UOH	EFLU	PU	CUG	CUO	MZU
Literature search	✓	✓	×	✓	✓	✓	×	✓	×	✓	✓	×	×
Bibliography compilation	✓	×	×	✓	×	×	×	×	×	×	×	×	×
CAS	✓	✓	×	✓	✓	×	×	×	×	✓	✓	×	×
SDI	×	✓	✓	✓	✓	×	×	×	×	×	×	×	×
Web services	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Reference services	×	×	×	✓	✓	✓	×	×	×	×	×	×	×
Document delivery services	×	×	✓	✓	✓	✓	×	×	×	×	×	×	×
Newspaper clippings	×	×	×	✓	✓	×	×	×	×	×	×	×	×
Transcription services	×	×	✓	×	×	×	×	×	×	×	×	×	×
Talking dictionary	×	×	✓	×	×	✓	×	×	×	×	×	×	×
Braille translation	✓	✓	✓	×	✓	✓	×	✓	×	✓	×	×	✓
Screen reading enabled library catalogue	✓	✓	✓	✓	✓	✓	×	✓	×	✓	✓	✓	✓
Total	**6**	**6**	**7**	**9**	**9**	**7**	**1**	**4**	**1**	**5**	**4**	**2**	**3**

✓ **Means Yes and** × **means No**

7.6 Problems Encountered by the Universities in Providing Services

The study ascertains the problems encountered by the universities in providing services to the visually impaired persons. From table 6 it was revealed that lack of awareness among users about resources is the problem mentioned by most of the universities viz. DU, JNU, NEHU, EFLU, MZU, SU, and CUPB followed by the problem of time consuming scanning process, problem of trained staff to deliver services, poor internet connectivity and less number of resources compliant with standards. PU and CUG didn't mention any of the problems.

Table 6 Problems Encountered by the Universities

Difficulties Encountered	AMU	BHU	DU	IGNOU	JNU	JMI	NEHU	UOH	EFLU	CUO	MZU	SU	CUPB
Lack of funds	×	×	×	×	×	×	×	×	×	×	×	×	×
Trained staff to deliver services	×	×	×	×	×	×	×	×	×	×	×	✓	✓
Sustainable equipments	×	×	×	×	×	×	×	×	×	×	×	×	×
Visually impaired users attitude	×	×	×	×	×	×	×	×	×	×	×	×	×
Maintenance of assistive software and equipments	×	×	×	×	×	×	×	×	×	×	×	×	×
Unstandardized open access resources	×	×	×	×	×	×	×	×	×	×	×	×	×
Less number of resources compliant with standards	×	×	×	×	×	✓	×	×	×	×	×	×	×
Lack of Awareness among users about resources	×	×	✓	×	✓	×	✓	×	✓	×	✓	✓	✓
Scanning process consumes time	×	×	×	✓	✓	×	×	✓	×	✓	×	×	×
Poor internet connectivity	✓	✓		×	×	×	×	×	×	×	×	×	×

✓ **Means Yes and** × **means No**

8. Major Findings

The present study was conducted on 15 central universities of India to identify the knowledge resources provided by the universities to visually impaired persons. It was found that all the universities are not in a position for providing even basic resources to their visually impaired users. AMU is the only university which possess all the resources viz. braille books, audio books, talking books, talking newspaper, braille magazines, while serve with only 7assistive equipments, 7assistive softwares and 6 information services followed by JMI which is the leading university in facilitating assistive technologies to it users with 8 assistive equipments and viz. screen magnifiers, hand-held scanners, ruby, Digital voice recorder ICU-UX70, readlt wand, eye-c handheld video magnifiers, talking scientific calculator, Plextalk PTR2 and 8 assistive softwares viz. SAFA Reader, Open Book, Read Easy, Screen reader, Vaachak, Magic Pro Magnification, Talking Typing Teaching Pro and Infity reader and Chatty Infity software while lacking in knowledge resources, it possess braille books, talking books only and 7 information services.

BHU possess braille books, talking books, audio books, talking newspaper and acquires 5 assistive equipments, 3 assistive softwares and 6 information services. DU serves with braille

books, talking books, audio books, talking newspaper, 4 assistive equipments, 5 assistive softwares and 6 information services. JNU facilitates with braille books, talking books, audio books, talking newspaper, 7assistive equipments, 4 assistive softwares and 9 information services. EFLU has braille books, audio books, 1assistive equipment and 1 information servics. IGNOU possesses braille books, talking books, 4 assistive equipments, 1assistive software and 9 information services. UOH has braille books, 4 assistive equipments, 3 assistive softwares and 4 information services. CUO serve with only 2 assistive softwares, it facilitates with audio books which are available only in their regional language i.e. odia and 2 information services. CUPB has only braille books and audio books. SU only possesses braille books.

It was also found that some universities facilitates with only assisitive technologies and information services such as PU with 4 assistive equipments, 4 assistive softwares and 5 information services, CUG facilitates with assistive equipments, 4 assistive softwares and 4 information services, MZU facilitates with 2 assistive equipments, 1 assistive software and3 information services and NEHU possess only 1assistive equipment, 1assistive software and 1 information service. The major problem mentioned by the Universities under study in providing services to this group of users are the user awareness about the resources followed by the problem of time consuming scanning process, problem of trained staff to deliver services, poor internet connectivity and less number of resources compliant with standards.

9. Discussion, Conclusion and Recommendations

Visually impaired are the socially marginalised persons for whom there is a compatibility problem as the advancement in information access in not going at the same pace for them. Libraries have the moral responsibility of provding knowledge needs of their users, to accomplish this task libraries must acquire accessible technologies for those who need assistive devices to access information resources should be on equal terms. The true disability and all its negative consequences will be faced when librarians are not able to opt for the accessible resources (Schmetzke 2002). Knowledge resources in the universities of India for visually impaired are not up to the mark, with these basic facilities it would be difficult for students to pursue higher studies and conduct research and developments. Visually impaired persons in India depend on special library services provided by NGOs because libraries in India are still not disabled friendly due to lack of implementation of PWD act (Pillai, 2011). These are the reasons that conditions in India are almost exactly the opposite of those prevailing in Great Britain, since the last century they have done more for the visually impaired persons than any other country in the world. We have been slow to realize the justice of the blind man's claim to education and knowledge, employment, and all that goes to make "the good life" (Bhardwaj, Shukla and Yogesh, 2005).

Based on the finding following recommendations are given to ensure inclusive information services for visually impaired persons:

- Libraries should conduct orientation programmes for their visually impaired users to overcome the problem of user awareness as mentioned by most of the libraries.
- Provision of adequate funding for libraries as well as periodical review of funding policies so that libraries can maintain at least basic infrastructural facilities for visually impaired persons.
- For any library it is difficult to fulfil the demand of visually impaired all alone. So, for this all the institutions should share their resources and collection to serve visually

impaired persons effectively and with this network it will also be possible for libraries to attract international donors.

- Universities must ensure that they should employ skilled and trained staff in terms of the knowledge about braille and assistive techniques of information access so that they can help the visually impaired learners.
- Libraries must invest in assistive technologies because they are necessary for these users to access information when there is such an information explosion.

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