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Study on Awareness and use of Assistive Technologies for Information Support fsor Differently Abled Persons

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Abstract - As a critical component of any healthy civilization, information is essential to the advancement of all humanity. People with disabilities are acquiring informational requirements at the same rate as the general population. People with disabilities constitute a substantial portion of our population, and it is our responsibility as members of society to ensure they have equal access to all possibilities. Access to information for all users, including those with physical restrictions, has vastly increased in recent years due to technology improvements. Today, conveying data frequently requires electronic access, networked resources, and other forms of information and communication technology (ICT). Due to the rapid development of ICT, information is now accessible within seconds. The gap is closed by assistive technology, which facilitate access to a broad variety of resources that would otherwise be unavailable to people with impairments. This article investigates the Awareness and Use of Assistive Technologies for Information Support by People with Disabilities.

Keywords - Awareness, Use, Assistive Technologies, Information Support, Differently Abled.

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INTRODUCTION

In a society, information is a fundamental ingredient for the development and evolution of its persons. In this way, all individuals including diverse folks in our society have a right to knowledge. The rapid expansion of ICT has made it possible to deliver information to everyone, whether they are ordinary individuals or otherwise. Like ordinary people, information among the variously capable folks is increasingly needed. We also, as a social entity, should be accountable for providing diverse people with a widespread accessibility and additional services in our society to allow them to maximize their lives (Bhyrappa, 2016).

Technology has played a major role today in changing the method in which various people receive information, particularly those who are different. Electronic access, networked resources and other kinds of ICT have become standard information delivery across several days. Due to rapid expansion and development in the field of ICT, information might be available in seconds. The technology, which is mostly a boon to disabled individuals to access information within a few seconds and the many support technologies, bridge the gap by giving these people creative methods to access diverse resources. Data from the 2011 census indicated that around 2.21% of the population is disabled (Roberts, 2010).

Differently abled people

'Distinctively capable persons' implies humans with any restrictions or capacity to execute an activity in the manner in or within a range deemed normal to a human being coined by the US Democratic National Committee at the beginning of 1980 as simply an acceptable phrase as handicapped persons; For their everyday operation they need specific assistance and equipment. In order to achieve complete social development, intergovernmental organizations, national authorities and nongovernmental organizations, have developed groundbreaking policy choices through a plethora of specialist programmes and plans for those who are not happy. The Individuals with Disabilities Act 1995 states that persons with diverse capabilities should have access to information at all levels (Mobus, 2010). Every day technological development represents a fresh hope for these people and here is the importance of ICT. The word ICT refers to all applications relating to communication, that is to say, 'ICT refers to telecommunications technology that provides access to information. It is related to IT, but mostly focuses on communications technologies. This covers wireless Internet, cellular and other means of communication" (The tech terms computer dictionary).

The impact of ICT on differently abled persons

The introduction of ICT has provided the people with so many advantages. One such thing is assistive technology, so that it can live with at most potential. The Assistance to Individuals with Disabilities Act of 1988 defines assistive technology as a "commercially-acquired item, piece of equipment or product system, modified or custom-made for the growth or improvement of disabled persons". It helps such individuals achieve a maximum degree of access and independence (Cassner, 2011). There are so many ACTS, policies, and rules in society at international, country or state level. They are very important in society. ALA, IFLA etc. contribute far more to this subject at international level. The back of India isn't distant. These Indians are provided with further assistance by the individuals with disabilities Act 1995. It will now be superseded by the Human Rights Act, 2016, which provides for all the UN Convention on the Rights of Persons with Disabilities. Some of the institute that serves people in India with varied skills;

- National Institute for the Visually Handicapped
- National Institute for the Hearing Handicapped.
- National Institute for the Orthopedically Handicapped
- National Institute for the Mentally Handicapped
- The Institute for the physically handicapped.

Assistive technologies and the differently abled

For these persons, there are certain supporting technological items. High technology, low technology and medium-level technologies for example. In India 2, 68, 10,557 individuals of varied abilities and 7, 61,843 persons in Madhya Pradesh, ie, 2.2 percent of the total population, were according to the 2011 census. For their everyday work, they need specific assistance and devices and can help them reach their goals. There are various initiatives and policies at government level that empower them (Lewis, 2013). There are so many institutions in Madhya Pradesh to assure educational accomplishments and improved opportunities for growth. The category comprises visually impaired individuals, those with speech- and hearing impairments and persons with locomotives. A visually impaired person is one, according to legally defined term, if he or she has visual acuity of 20/200 or less even with correction in the better eye, or if he has a sight so little that the largest width is no more than 20 degrees angular (Copeland, 2011).

The people with these two communication impairments are considered speaker-individuals for the study. In this study Another group of people with varied capacities are those with mobility disabilities who are locomotive disabled, that is, the incapacity of a person to do characteristic movement activities is termed locomotive disabled folks. The traditional braille books, audio books, daisy books, screen reader software such as JAWS, NVDA, orca, are many assistive technologies for visually impaired people. The hardware of the visually handicapped is hardware such as the scanner, reader, voice recorder, braille printer, braille slate, angel player/daisy player. Braille is the old visually impaired aid technology and is a tactile code for the blind to read and write with a combination of six rectangular points (Yoon, 2011).

LITERATURE REVIEW

Bhardwaj (2018) studied the access of visually challenged students to information mechanism in selected institutions in Delhi. The study analyzed the availability of ICT in five main universities, problems experienced by library professionals in providing visually impaired students with information resources, the information services provided and library requirements to develop online information systems for visually impaired users. Data collection was done using the questionnaire approach. The study found that facilities are relatively inadequate and do not have the infrastructure to meet their information demands for visually impaired students in higher education institutions. It also revealed lack of funding and training for these visually challenged students in University libraries in Delhi. Furthermore, it was noted that libraries experienced difficulty offering services to students who were visually impaired due to a lack of adequate supporting technology.

Anis, Rubina (2015) The use of electronic information services in bookstores with visually impaired products, support technology for visually impaired and blind individuals from state of the art to future trends, as emphasized in her study, gives these people an insights into the state of the art supporting technology, with a focus on the learning's of published studies of the past two decades and on what to learn. They carried out an impartial statistical study based on the data base analysis of research papers in this field and found that there has been a steady increase in the field of visually impaired aid technology from 1990 to now.

Lundh and Johnson (2015) in its research, "the use of digital speech books by persons with disabilities: a literacy review" examining the use of digital speech books, i.e. DAISY books, the options and limits of those users to utilize them. It also highlights DAISY books navigational characteristics, which seem to give users an unparalleled opportunity to read.

Adetoro, Niran (2014) it is shown that information resources are adequately made available in the southwestern libraries of Nigeria, to evaluate the

supply of information materials in alternative forms and their accessibility and usage by visually impoverished individuals. He also researched e-resources, but these are also not available. The main results of the study are that traditional "Braille" information resources are the most often utilized content.

Majinge and Stilwell (2013) the study evaluated the provision of library services in academic libraries in Tanzania to individuals with visually impaired persons and in wheelchairs. They investigated information sources and library structures at five institutions in Tanzania. They studied information resources. The study shows that academic books provide services for visually impaired and on wheelchairs, but these are not ubiquitous or included. They thus suggest that all consumers, including disabled persons, get inclusive services. They also proposed that policies should be created to provide these folks with inclusive services.

Ekwelem, V.O (2013) Studies in South-East Nigeria on the utilization of electronic resources by disabled users. The study was attended by 194 handicapped library customers. The findings reveal that the visually impaired have only recorded books and OPAC available electronic resources. It was also found that the mobility information sources challenged were not available to one of the undergraduate universities either. The research findings also showed that costs for the purchase and equipping of e-resources are referred to as restrictions for handicapped users. It also recommends that the systems should also include these persons and that universal accessibility would be facilitated.

Pillai, Priya R (2013) it presents a thorough library sketch and visually impaired information services in India. In the study she visits, 83 respondents participated and the study offers various facilities and services, specialized services, information resource, information materials provided for these visually impaired students by NIVH, twenty-four university libraries, seven state central library's as well as seven NGOs, and these institutions.

RESEARCH METHODOLOGY

The differently abled persons are an unavoidable part of our society. The participants in this study are differently abled people of Jabalpur district of Madhya Pradesh institutions and organizations that provide them assistive technology for information assistance. Jabalpur Madhya Pradesh is situated in the heart of the country. Through the area, the Narmada River provides a major supply of drinking water. Between $23^{o}10'$ North latitude and $79^{o}59'$ East longitude, the city is situated. There are 10,160 square kilometres in the Jabalpur district, with an average elevation of 411 metres. The city has a population of around 10.65 million people. According to Census 2011, there are 2, 68, 10,557 differently abled people in India, accounting for 2.2 percent of the total population. They require specific assistance and equipment for everyday functioning as well as to empower them to attain their goals.

Sampling Techniques and Sample Size

The study's participants are of Jabalpur district of Madhya Pradesh differently abled people. The investigator chose a representative sample from the aforementioned population for the investigation. Stratified random sample was used to guarantee that all types of users from the institutions/organizations that provide assistive technology for them are represented. For this study, a representative sample was drawn from the following notable institutions/organizations that provide assistive technologies:

Artificial Limbs Manufacturing Corporation of India (ALIMCO) Jabalpur Madhya Pradesh

Data Types, Collection Methods and Tools Used

Collection of Primary data: Primary data regarding this research was collected by using questionnaire and schedule.

Questionnaire: Investigator created a systematic questionnaire with the aid of a supervising instructor and based on a review of related literature. It had six components. A, B, C, D, and E; Part A comprised personal information such as gender, age, institution name, academic status, and differently abled person category. Part B included questions that examined the institutions' facilities for differently abled users. Questions concerning the usage of ICT-based information resources/devices/tools was included in Part C. Part D entails inquiries concerning assistive hardware, software, and other technologies, as well as their awareness and use. Part E asked respondents to rate their satisfaction with assistive technology for the differently abled as well as their hurdles to using them.

Collection of Secondary data

Secondary data are also crucial in a research study to achieve the goal. Secondary data was collected and used in this study, such as differently abled persons definition, different categories, different governmental level policies and Acts for them, assistive technologies for information support for them, etc., published in books, journals, online journals, websites, official records, of various institutions/organizations.

Data collection procedure

Because the users are of varying abilities, the investigator used a mix of data gathering methods in this study. The questionnaire, interview, and personal observation methods, the investigator sent questionnaires to the participants in order to collect data.

Scaling techniques used

For the analysis of questions dealing with diverse ratings, a Likert-type scale or summated scale is employed. Respondents have the opportunity to agree or disagree with each statement or choice. In this study, the investigator utilized a three-point scale.

Statistical Techniques Used For Analysis of Data

The following statistical techniques was used to analyze the collected data:

- **Percentage method:** Percentage method was used to concise the collected data.
- **Weighted average mean:** It is the method of calculating central tendency of a given data. Weight age was given to each option on the basis of their preferences.
- **Chi- square test:** Chi-squire test was a parametric test in statistics, which was used to check the significance of association between variables in the study.
- **Consolidation of data:** Collected data through questionnaire was consolidated using MS Excel 2010 and further statistical tests was done by using SPSS and MS Excel.

RESULTS

One of the most crucial steps in any research project is analyzing the collected data. An important part of this process is doing a thorough analysis of the gathered data while keeping the study's goals in mind. Various statistical methods are used for quantitative analysis in social science studies.

Table 1: Geographical distribution-Category wise

Categories	Geographic Area		Sample Total
	Rural	Urban	
Visually Impaired	160 (68.09)	75 (31.91)	235
Speech & Hearing Impaired	134 (93.06)	10 (6.94)	144
Locomotor Impaired	64 (74.42)	22 (25.58)	86
Aggregate	358 (76.99)	107 (23.01)	465

Table 1 shows that among the respondents, 68.09% of visually impaired persons opined about the geographical location of institutions from where they obtain assistive technology are from rural area and only 31.91% are from urban area. 93.6% of speech & hearing-impaired persons approach the institutions in rural area, only 6.94% from urban area. Among the locomotor impaired persons, 74.42% obtain assistive technology from the institution in rural area and only 25.58% are from urban area.

Table 2: Geographical distribution- Status wise

Status	Geographic Area		SampleTotal
	Rural	Urban	
Student	279 (74.4)	96 (25.6)	375
Teaching faculty	22 (88)	3 (12)	25
Others	57 (87.69)	8 (12.31)	65
Aggregate	358 (76.99)	107 (23.01)	465

Data in the Table 2 depicted that 74.4% of students, 88% of teaching faculty, 87.69% of others are from rural area whereas 25.6% of students are from urban area followed by almost equal percentage of teaching faculty and others.

Various institutions providing information sources and assistive technologies are analyzed here in the Table 3.

Table 3: Institutions -Category wise

Institutions	Category			Sample total
	Visually impaired	Speech &hearing impaired	Locomotor impaired	
Libraries	70 (45.16)	69 (44.52)	16 (10.32)	155
Non-Governmental Organisations (NGOs)	90 (58.06)	35 (22.58)	30 (19.35)	155
Special Centres	75 (48.39)	40 (25.81)	40 (25.80)	155
TOTAL	235 (50.53)	144 (30.96)	86 (18.49)	465

As per the data in the Table 3, various institutions under study are, libraries and, Non-Governmental organisations and special centres in Jabalpur district, Madhya Pradesh. The category wise analysis of differently abled persons shows that a major representation, 58.06% of visually impaired are in NGOs followed by 48.39% of visually impaired persons in special centres. While 44.52% of Speech & hearing impaired in libraries an 25.81% of speech

& hearing in special centres are good users of these institutions for their information support. A good number of locomotor impaired also these institutions for approaching assistive technologies for information support.

Table 4: Use of ICT based tools/devices- Category wise

ICT tools/ devices	Category	Always	Often	Sometimes	Rarely	Never	Total
Desktop	Visually impaired	119 (50.64)	98 (41.70)	18 (7.66)	0	0	235
	Speech & Hearing impaired	87 (60.42)	57 (39.58)	0	0	0	144
	Locomotor impaired	49 (56.98)	30 (34.88)	7 (8.14)	0	0	86
Laptop	Visually impaired	102 (43.40)	114 (48.51)	19 (8.09)	0	0	235
	Speech & Hearing impaired	63 (43.75)	81 (56.25)	0	0	0	144
	Locomotor impaired	22 (25.58)	50 (58.14)	14 (16.28)	0	0	86
Notebook	Visually impaired	18 (7.66)	17 (7.23)	96 (40.85)	55 (23.40)	26 (11.06)	212
	Speech & Hearing impaired	0	0	90 (62.50)	0	0	90
	Locomotor impaired	2 (2.33)	53 (61.63)	5 (5.81)	26 (30.23)	0	86
Tablet	Visually impaired	2 (0.85)	60 (25.53)	89 (37.87)	67 (28.51)	0	218
	Speech & Hearing impaired	0	0	109 (75.69)	27 (18.75)	0	136
	Locomotor impaired	30 (34.88)	3 (3.49)	47 (54.65)	4 (4.65)	0	84
MobilePhone	Visually impaired	214 (91.06)	5 (2.13)	16 (6.81)	0	0	235
	Speech & Hearing impaired	130 (90.28)	14 (9.72)	0	0	0	144
	Locomotor impaired	77 (89.530)	9 (910.47)	0	0	0	86
Printer	Visually impaired	0	17 (7.23)	36 (15.32)	181 (77.02)	1 (0.43)	235
	Speech & Hearing impaired	0	0	83 (57.64)	59 (40.97)	2 (1.39)	144
	Locomotor impaired	1 (1.16)	24 (27.91)	32 (37.21)	29 (33.72)	0	86
Scanner	Visually impaired	24 (10.21)	53 (22.55)	157 (66.81)	1 (0.43)	0	235
	Speech & Hearing impaired	0	0	83 (57.64)	59 (40.97)	2 (1.39)	144
	Locomotor impaired	1 (1.16)	24 (27.91)	32 (37.21)	29 (33.72)	0	86

The Table 4 shows the use of desktop computers, laptop computers, mobile phones etc. As per it, majority of the differently abled persons are using these devices in order to cope up with the present, Desktop computers are 'always' used by the visually impaired persons with a response of 50.64% followed by the laptop computers usage 'often' with a response of 48.51%. It shows almost equal users are using the devices desktop computers and laptop computers for their information need. Speech & hearing-impaired persons with 60.42% and locomotor impaired with 56.98% 'always' using the desktop computers.

Table 5: Opinion about the assistive software for visually impaired

Software	Fully Satisfied	Satisfied	Not Satisfied
JAWS	79 (33.62)	145 (61.70)	11 (4.68)
NVDA	67 (28.51)	145 (61.70)	23 (9.79)
Orca	50 (21.28)	176 (74.89)	9 (3.82)
FS Reader	53 (22.55)	171 (72.77)	11 (4.68)
Duxbury	43 (18.30)	181(77.02)	11 (4.68)
DAISY	49 (20.85)	153 (65.12)	33 (14.04)
ZoomText magnifier	64(27.23)	142(60.43)	29(12.34)
Kurzweil	78(33.19)	129(54.89)	28(11.91)
LIOS	71(30.21)	111(47.23)	53(22.55)

As per Table 5, it is found that among the visually impaired users 'JAWS' is the fully satisfied software with a response rate of 33.62% followed by Kurzweil (33.19 %) and LIOS (30.21%). Orca, FS Reader and DAISY satisfied software for the visually impaired users, whereas LIOS is not satisfied with a response rate of 22.55%.

Table 6: Preference of hardware for visually impaired

Hardware	Weighted Mean	Rank
Scanner/Reader	5.99	3
Webcam	1.22	6
Voice recorder	8.79	1
Braille printer/embosser	4.76	4
Magnifier/magnifying glass	0.22	7
Braille computer	2.94	5
Daisy player/angel player	8.30	2

Weighted mean value shows the preference in the Table 6 and 'voice recorder' is their first preference with a weighted mean value of (8.79). Second preference to 'Daisy player/Angel player' with a weighted mean value of (8.30) followed by Scanner/reader with a weighted mean value of (5.99) and it comes the third preference of visually impaired persons.

CONCLUSION

Everyone must keep up with the fast expansion of information if they are to remain relevant. As a result, all available facilities and technology should be made available to all people, including the differently abled, in order to integrate them into society. Today's technological advancements wasnefit the differently abled, allowing them to break free from their shells and achieve a high level of social acceptance. Information is essential for these communities' survival, so authorities, whether in libraries or other institutions, should provide all avenues for their recognition and encouragement, e.g., with most educational and intellectual pursuits, a library or any information centre can make a difference in the lives of these differently abled people, allowing them to realize their potential. Simply put, it is critical to remember that differently abled people are individuals with information needs similar to those of other people, so there should be a shift from "separation" to "inclusiveness," i.e., inclusive education or an inclusive library should be implemented to provide these people with access to information.

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