Availability and Use of Information and Communication Technology Resources for People with Disabilities in Nnamdi Azikiwe Library, University of Nigeria, Nsukka

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Abstract:

Purpose: *This study was carried out to investigate the availability and use of ICT resources for people with disabilities in Nnamdi Azikiwe Library, University of Nigeria Nsukka.*

Design/Methodology/Approach: *The descriptive survey research design was adopted for this study. Seven objectives and seven research questions were formulated to guide the study. A purposive sampling technique was used to select a sample size of 48 registered disabled users of the library. Instruments for data collection included a well-structured questionnaire and an observation checklist. Forty-eight copies of questionnaire were distributed to the users of the library with a return rate of 58.3%. The study used frequency counts, percentages, mean scores and ranking as statistical measures for data analysis.*

Findings: *The results revealed the only resources that are available and functional are the Braille, audio player/recorder, screen reader, text to audio converter, audio book, Jaw screen reader and the OPAC. The results also revealed that the services offered by the library are access to data bank, wireless internet and online reference service, among others. Furthermore, some ICT facilities such as speech synthesizers, electronic text, and audio books are used to a great extent. Respondents favored all the items to be relevant as opposed to screen a reader which is perceived to be strongly relevant.*

Implication: *Suggested solutions to challenges in the provision of ICT resources and services for the disabled include the training of librarians based on the difficulties facing disabled users and enactment of law in order to force the university to have a provision for the disabled among others.*

Originality/Value: *It was recommended that there should be the design of various software which would enable disabled users to access available technology and that the existing library facilities should be redesigned and modified with new technologies, among others.*

Keywords: *Availability of Resources; Use of Resources; ICT Resources; People with Disabilities; UNN*

Introduction

The freedom to access and use information is a basic human right. The right to information and knowledge is a fundamental right of every individual including the persons with disability. Knowledge is power, for man dwells in the society of learning. It is true that limited access to information and knowledge impact on all people, but the consequences are more strongly felt by people with disabilities who require information to be provided in an accessible format.

The role of technology in teaching and learning is becoming a topic of discussion in educational system in contemporary Nigeria. A fundamental change is taking place in our educational system as the application of technology in all spheres of human endeavours is permeating the education system. The innovation that Information and Communication Technology (ICT) has brought into education has made tremendous changes to the lives of people in the society, including individuals with disabilities. Thus, the use of ICT to acquire knowledge and skill has become an essential element in education and training, and these ICT elements in the educational process have good effects if properly applied. It is a vital tool for providing effective instruction in the classroom and solving communication problems, while its applications are making dramatic changes in the economic and social developments of the society. According to the G-8 Nations' Forum (2000), ICT has proven to be a very powerful tool in educational reform. In Nigeria, special education programmes seem to

still be adopting the old fashioned machines, typewriters, conventional teaching methods, chalkboards among others in teaching and learning.

According to BBC English dictionary (n.d.), disability is defined as a physical or mental condition which implies one cannot use a part of one's body completely or easily or that one cannot learn easily: a physical/mental disability; people with severe learning disabilities such as (dyxlesia). Disability in persons may be present from birth or occur at a stage in a person's lifetime. Disabilities are an umbrella term, covering impairments, activity limitations and participation restrictions. People may be disabled by physical, intellectual or sensory impairments, conditions or mental illness. Disability and handicapped are used interchangeably.

The tripartite name Information and Communication Technology used to depict this mind blowing innovation of science is a perfect combination of three indispensable factors that constitute the giant tripod on which modern civilization stands. A clear understanding of the Information and Communication Technology (ICT), terminology will help portray a lucid picture of what the future holds for mankind as this scientific innovation continue in the increasing pace as it is going today. According to the BBC English dictionary, ICT is the use of computers, the internet video.

ICT is the devices and principles involved in information processing, as well as electronic communication which includes all the hardware and software needed for processing in teaching and learning (World Bank Report, 2006). Roongta in Etonyeaku (2009) described ICT as all the forms of technology used to transmit, store, create, share or exchange information. In a broader sense, ICT includes such technologies like radio, television, video, telephone, satellite systems, computers, network, hardware and software. ICT is a combination of network of software and hardware as well as a convergence of information, communication and technology. They are technological tools and resources used to communicate, create, organize, disseminate, store, retrieve and manage information and learning (Obi, 2002). ICT can provide access to information source, create interacting learning environment, they can enable communication and promote changes in methods of teaching these exceptional students.

Availability of ICTs in special needs education would be instrumental to per excellence reduction of the challenges of the handicapped in our society. A good number of researches have shown that learning can be significantly enhanced when ICT is approached and utilized as an intellectual multi- tool.

The University of Nigeria, Nsukka (UNN) was the first full-fledged indigenous and first autonomous university in Nigeria, modeled upon the American educational system. It is the first land-grant university in Africa and one of the five elite universities in the country. The university has 15 Faculties and 102 academic departments. The University offers 82 undergraduate programs and 211 postgraduate programmes (Star Africa, 2014; NG Scholars, 2013).

Thus, the university has a vital part to play in providing ICT resources for the development of the intellect, the imagination and knowledge of everyone, in whatever condition of body or mind, whether this be at home, or school. Each category of handicapped makes specific and possible differing requirements of the library and many possible differing ways of attempting to meet those requirements. Some handicapped require physical design provision, some special format or resources, others require the library to go out to them, and so on (Mba, 1982). Because of these varying demands, the education of the handicapped persons must necessarily be different from that of the normal persons. However the aims and objectives of education are the same for the handicapped person as for the normal persons; although this is so, if the handicapped persons (such as the blind, deaf and dumb) are exposed only to the educational experiences and materials used with sighted or normal persons, they would not achieve their educational goals. Appropriate and enhanced materials therefore, make their learning effective and meaningful (Adima, Ladipo & Abosi, 1981).

Statement of the Problem

The ideal library in our contemporary world can be described as a facility where every member of the community is offered the full benefits of the latest information in both print and digital formats. However, Nigerian University Libraries have been criticized on the grounds that people with disabilities are not provided for by the libraries. For instance, internet use remains beyond the reach of many disabled library users as they are physically and psychologically unfit

to do access it. Some libraries and librarians are not helping matters by thinking that any help rendered to disabled users is considered as an act of sympathy rather than as a necessary requirement which libraries must provide.

Infrastructure is another problem in most libraries in Nigerian Universities. There is hardly any provision of ramps or any electronic devices that assist wheelchair users to gain entry into the library. For the visually-impaired users, large monitors using large fonts, is one way to improve visibility but they are hardly available in our University libraries.

Cost is also a factor in the low use of ICT by disabled users. The cost per minute of internet use is higher in Africa than elsewhere. In Sweden, the annual cost of internet use for 20 hours is 0.12 percent of GDP per capita, whereas in Nigeria, it is 55.13 percent. Clearly, for most Africans, economic accessibility or affordability limits physical accessibility (Ya'u in Ekwelem, 2013).

The web has evolved rapidly in recent years, providing the public with access to vast stores of information. However, not everybody is enjoying this. The web creates two potential difficulties for visually impaired persons. First, hypertext web documents are nonlinear, allowing users to link quickly to other pages that may have a completely different design and layout. This may cause confusion for those who cannot easily follow visual cues. Second, the web now revolves around video, multimedia real–time collaboration, and interactive documents, all of which are heavily visually based (Chiang et al., 2005). These are the problems that have motivated the researcher to carry out this study.

Literature Review

Availability is the state of being able to be obtained or used. Availability, according to Katukoori (2006) is defined as "a measure of the degree to which machinery and equipment is in an operable and committable state at the point in time when it is needed." As machinery refers to any tool used in the library, equipment here can be the resources in the library (informational and human resources). It is expected that for a library to fully functional in full capacity, the materials needed by the users must be available as much as the staff whose duty it is to guide the library users. Apart from the equipment, the process being performed, which is library services, can be brought into the hold of this definition.

Availability can also be understood as the ability of an item to be in a state to perform a required function at a given instant of time within a given time interval, assuming that the external resources, if required, are provided (Cigno, 2009). Surrounding the concept of availability in Library and Information Science are such external resources as funding. When funding in the library is not satisfactory it can lead to unavailability of resources in the library or even the inability to access these resources when they are available. Soderstrom (2009), in depicting the relationship between accessibility and availability, opines that access to the available technology is an important factor.

Disability is a condition which prevents one from performing all usual physical or mental functions. This usually means a permanent state, like blindness, but in some cases is temporary. According to *West's Encyclopedia of American Law* (1997), legally, the term usually signifies an incapacity to exercise all the legal rights ordinarily possessed by an average person. Convicts, minors, and incompetents are regarded to be under a disability. The term is also used in a more restricted sense when it indicates a hindrance to marriage or a deficiency in legal qualifications to hold office. In the context of American Workers' Compensation statutes, disability consists of an actual incapacity to perform tasks within the course of employment, with resulting wage loss, in addition to physical impairment that might, or might not, be incapacitating. These are different views of the term which are not straight in line with our preoccupation with the term here. Here, we are looking at persons with disabilities to include those who have long-term physical, mental, intellectual, or sensory impairments which in interaction with various barriers may hinder their full and effective participation in society on an equal basis with others (Leonardi et al., 2006).

Disabled people, irrespective of where they live, are statistically more likely to be unemployed, illiterate, to have less formal education, and have less access to developed support networks and social capital than their able-bodied counterparts. Consequently, disability is both a cause and consequence of poverty (Yeo, 2005). By understanding the differences and challenges met by each group, support staff aiding people with disability will be better equipped to allocate

the resources appropriately. Also, it is important to ensure that support staff will not become themselves a barrier to people with disability participating in virtual communities (Stendal, 2012).

The World Bank defines ICTs as "the set of activities which facilitate by electronic means the processing, transmission and display of information" (Rodriguez & Wilson, 2000). This definition is closely aligned to that of ESCAP (2001) who define ICTs as "technologies people use to share, distribute, gather information and to communicate, through computers and computer networks." Similarly, in the words of Adamu (2004), ICT is defined as a "diverse set of technological tools and resources used to communicate, and to create, disseminate, store, and manage information." ICT implies the technology which consists of electronic devices and associated human interactive materials that enable the user to employ them for a wide range of processes some of which have to do with personal use. These technologies include computers, the Internet, broadcasting technologies (radio and television), and telephony. In other words, ICT is that technology which uses the information to meet human need or purposes including processing and exchanging.

ICT includes all technical means that are used for handling information and facilitating communication, including computers, network hardware, communication lines and all the necessary software. In other words, ICT is comprised of information technology, telephony, electronic media, and all types of process and transfer of audio and video signals, and all control and managing functions based on network technologies (Celebic & Rendulic, 2011). Because ICTs are basically information-handling tools (a varied set of goods, applications and services that are used to produce, store, process, distribute and exchange information), many think that the concept refers only to latest computers and internet-based technologies. The term also refers to simple audio visual aids such as the transparency and slides, tape and cassette recorders and radio; video cassettes and television; and film. These older and more familiar technologies are referred to under the collective heading of "analogue media" while the newer computer and Internet based technologies are called the "digital media". Reddi (2012) strongly believes that in today's world, with the increased convergence or blending of the engineering designs and with the coming together of the satellite and the computer, the dividing lines between these different media are becoming blurred and consequently, the way people define and refer to ICTs is also getting blurred. Often, the definition of ICTs is also done in terms of "old" and "new" as if to distinguish between the analogue and digital.

According to the IFLA Guidelines for Development of The Public Library Service (2001) "the development of collections should be based on the principle of access for all and include access to formats appropriate to specific client groups." This statement is made in consideration of the various differences which are found as definitive features of the population of users of any library in the world. The library should consider these differences and build her holdings bearing in mind to serve every population of the library clientele. This can be done by making provisions for the acquisition, organization, storage and dissemination of different formats.

It is in light of including the disabled in the dividends of library and information services that UN (2013) posits that librarians as information providers ought to serve as a centre of expertise where persons with disabilities may seek advice on accessing e-content suited to their specific set of abilities. This is where ICT comes in as an avenue to enable the librarian in reaching out to the disabled or responding the disabled who reach out to him. The application of ICT to this form of special library and information services is expertise on its own, a valid point that supports that the librarian in question is a professional information provider. It is also guarantees that the library has ideal library and information services system where each individual "has access to the materials and information at the time they are required, in a format that can be used, in the quantities that are needed, and where the needs of the user are understood by the staff" (Machell, 1996).

When it comes to special library and information services to the disabled, "the importance of ICTs lies in their ability to open up a wide range of services, transform existing services and create greater demand for access to information and knowledge, particularly in underserved and excluded populations, such as persons with disabilities" (UN, 2013). It is true that special library and information services to the disabled

using ICT demands time, skills, patience and financial commitment, but it is a task that must be done because of the moral backing that caps it. Libraries and librarians "have a moral obligation to make information available to all categories of users regardless of their gender, age, race, political affiliation or disability. Such inclusive, non-discriminatory service however still remains the ideal rather than the norm as some people remain underserved in terms of access to information" (Babalola & Yacob, 2011).

Boshe (2013) conducted an assessment of policy and legal frameworks on e-accessibility for persons with disability in Tanzania. The two main barriers to e-accessibility which he tabled in the work were exclusive ICT products and services, and invisibility of people with disability in statistics. He argued that there is little consideration for the disabled when ICT products are being made by different companies. When it comes to the services also, almost every service centre that uses ICT has little or no provision for this special group of people. He also argued that persons with disabilities are often invisible in policies' formulation process and statistics. Even when they are visible, their visibility is limited to persons with disability within medical meaning.

He recommended that the legislature should wake up in performing their duty to the disabled which has to do with enacting laws and bringing about policies that will give these power the ability to have unlimited access to e-resources and services. Apart from the legislative arm of the government, he also advocated for pro-active measures from states, the central government and the communication sector. While they are busy enacting new laws, Boshe also recommended an amendment or review of other existing laws.

Research Questions

1 What are the ICT resources available for people with disabilities?
2 What are the various ICT services offered by Nnamdi Azikiwe Library, UNN to the disabled?
3 To what extent are ICT resources used by people with disabilities in UNN?
4 What are the levels of relevance of ICT to persons with disabilities in UNN?
5 What recommendations can be made to overcome challenges encountered in the provision of ICT resources to people with disabilities in UNN?

Methodology

The descriptive survey method was designed for this study. This method is defined by the Office of Research Integrity (n.d.) as "any study that is not truly experimental" but is conducted to demonstrate associations or relationships between things. Brickman & Debra (1998) suggest that descriptive studies can answer questions such as "What is?" or "What was?" This design is suitable for this study because through the data collection it will enable an easy establishment of facts about disabled people as it concerns the availability of ICT resources for and its use by them.

The entire population, being small constituted the sample size. Purposive sampling technique was used to reach all the respondents. Forty-eight of them could be identified. This number is completely representative of the group under study. The instruments for data collection for this study are the questionnaire and observation checklist. The questionnaire was designed and used to collect data from disabled persons in the University of Nigeria, Nsukka. It contained options bordering on ICT services, ICT resources for the disabled. The researchers also used the observation checklist to find out the ICT resources available for the disabled, and whether these are functional or not.

Data Analysis

The responses in the questionnaires are presented in mean frequencies and subsequently presented in tables accompanied with the analysis and interpretation.

Table 1: ***Return rate of the questionnaires***

	FREQUENCY	**%**
Distributed Questionnaires	48	
Returned Questionnaires	28	58.3
Not Returned Questionnaires	20	41.7

Table 1 shows that a total of 48 copies of the questionnaire were distributed to the disabled library users of Nnamdi Azikiwe Library, UNN. Of the 48 questionnaires given out, 28 (forming 58.3% of the respondents) were returned while

20 (forming 41.7% of the respondents) were not returned.

Research Question 1: What are the ICT resources available for people with disabilities?

In finding out the availability and use of ICT resources for people with disabilities in UNN, the observation checklist was used as a cross checking instrument to find out the quantity of availability of each of the resources (QTY) and also to confirm whether they are functional (F) or not functional (NF). It was also used to record the resources that are not available. The result is presented in Table 2.

Table 2: ***ICT resources available for people with disabilities in Nnamdi Azikiwe Library, UNN (Observation checklist result)***

S/N	TYPES	AVAILABLE		NOT AVAILABLE
		F	N F	
1.	Braille	√		
2.	Braille printer			√
3.	Specialized keyboard			√
4.	Video magnifier			√
5.	Audio player/recorder	√		
6.	Audio book	√		
7.	Screen readers	√		
8.	Text to audio converter	√		
9.	Windows eyes web browser			√
10.	Duxbury Braille translator			√
11.	Speech synthesizer			√
12.	E – Braille			√
13.	Talking web browser			√
14.	Touch screen computer			√
15.	Jaws screen readers software	√		
16.	Glare protected computer screen			√
17	Online Public Access Catalogue (OPAC)	√		

Result from Table 2 shows that the ICT resources available for the disabled users in Nnamdi Azikiwe Library, UNN are the Braille, audio player/recorder, audio book, screen readers, text to audio converter, Jaws screen readers and OPAC. Other ICT resources are not available. This signifies that disabled users of the library have access only a limited number of ICT resources.

Research Question 2: What are the various ICT services offered by Nnamdi Azikiwe Library, UNN to the disabled?

Table 3: ***ICT services offered by Nnamdi Azikiwe Library, UNN to the disabled***

S/N	ITEMS	AV	%	NA	%	DECISION
1	Braille printing	11	39.2	17	60.7	Not Available Rejected
2	Access to database	16	57.1	12	42.8	Available Accepted
3	Wireless internet	24	85.7	4	14.2	Available Accepted
4	Telephone user advisory	9	32.1	19	67.8	Not Available Rejected
5	Online reference service	20	71.4	8	28.5	Available Accepted
6	Online selective dissemination of information	15	53.5	13	46.4	Available Accepted
7	Online current awareness service	12	42.8	16	57.1	Not Available Rejected
8	Web Online Public Access Cataloguing (WebOPAC)	14	50	14	50	Available Accepted
9	User education for the disabled	10	35.7	18	64.2	Not Available Rejected

The disabled respondents were asked to identify the various ICT services offered to them by the library, by indicating "available" or "not available". Table 3 shows that some of the ICT services are available to an extent. These includes access to database which has the percentage score of 57.1%, wireless internet (85.7%), online reference services (71.4%), online selective dissemination of information (53.5%) and lastly web online public access (50%) while other ICT services were perceived unavailable. These are Braille printing, telephone user advisory services, online current

awareness and user education which are below 50%.

Research Question 3: To what extent are ICT resources used by people with disabilities in UNN?

In finding out the extent to which the disabled persons make use of the ICT facilities, the researcher computed the mean scores of the responses by users.

Resources with mean scores ranging from 3.5 to 4.0 were regarded as being available to a very great extent (VGE); those with mean scores ranging from 2.5 to 3.49 were regarded as being available to a great extent (GE); those with mean scores ranging from 1.0 to 2.4 were regarded as being available to a low extent (LE), and those with mean scores ranging from 0.0 to 0.9 were regarded as not available (NA). The mean scores were ranked from the 1st to the 6th. The result of the analysis is shown in Table 4.

Results displayed in Table 4 shows that electronic text (2.6), audio books (2.6), speech synthesizers with speech output (2.8) are used to a great extent while those with the mean score ranging from 1.o to 2.4 are used to a little extent, these are screen readers (2.3), large print (2.4), tactile graphics (2.0), large screen video/subtitle facility (2.1), and screen enlargement software (2.3).

Table 4: ***Extent of use of ICT resources by the disabled in UNN***

S/N	ITEMS	VGE	GE	LE	NAL	$\bar{x}$	RANK	DECISION
1	Speech synthesizer with speech output	11	6	5	6	2.8	1st	GE
2	Electronic text	6	8	11	3	2.6	2nd	GE
3	Audio books	11	4	5	8	2.6	2nd	GE
4	Large print	6	6	9	7	2.4	3rd	LE
5	Screen reader	6	4	10	8	2.3	4st	LE
6	Text enhancement software	3	10	8	7	2.3	4th	LE
7	Screen enlargement software	5	6	8	9	2.3	4th	LE
8	Large screen video and Sub-title facility	4	4	11	9	2.1	5th	LE
9	Tactile graphics	3	4	9	12	2.0	6th	LE
10	Online public access catalogue	7	6	3	12	2.0	6th	LE

Research Question 4: What are the levels of relevance of ICT to persons with disabilities in UNN?

The question as to the level of relevance in the use of ICT resources by persons with disabilities was answered using a computation of the mean scores of the responses by users of the library. Services with mean scores ranging from 3.5 to 4.0 were regarded as being strongly relevant (SR); those with mean scores ranging from 2.5 to 3.4 were regarded as being relevant (R); services with mean scores ranging from 1.0 to 2.4 were regarded as being strongly not relevant (SNR), and those with mean scores ranging from 0.0 to 0.9 were regarded as not relevant (NR). The mean scores were ranked from the 1st to the 7th. Below is the table.

Table 5: ***Level of relevance of ICT resources by people with disabilities in UNN***

S/N	RESOURCES	SR	R	SNR	NR	$\bar{x}$	RANK	DECISION
1	Screen readers	17	10	2	0	3.6	1st	SR
2	Electronic text	11	14	2	1	3.3	2nd	R
3	Tape books	11	15	1	1	3.3	2nd	R
4	Speech synthesizer with speech output	13	8	5	2	3.1	3rd	R
5	Large print	11	10	2	5	3.0	4th	R
6	Online public access catalogue	11	10	4	3	3.0	4th	R
7	Text enhancement software	8	14	4	2	3.0	4th	R
8	Tactile graphics	9	7	7	5	2.7	5rd	R
9	Screen enlargement software	6	11	7	4	2.7	5th	R
10	Larger screen video and Sub-title facility	5	12	6	5	2.6	6th	R
11	Adjustable keyboard tray	6	10	4	8	2.5	7th	R

Results in Table 5 displayed that screen readers (3.6) is strongly relevant among all, while other items are relevant with the mean score ranging from 2.5 to 3.4.

Research Question 5: What recommendations can be made to overcome challenges encountered in the provision of ICT resources to people with disabilities in UNN?

In answering the research question as to what recommendation can be made to overcome these challenges encountered in the library by the disabled person, the frequency counts and mean score of respondents were analyzed. The mean score of 2.5 was used as criterion mean point in determining this. The mean scores were also ranked from the 1st to the 5th. The summary of the analysis is presented in Table 6 below.

As displayed in Table 6, results show that majority of the respondents believe that there should be training of librarians based on difficulties facing disabled users (3.7), followed by enactment of law in order to force the university to have provision for the disabled (3.6), followed by people with disabilities should be included in the library system design (3.5), followed by the disabled should be given unsolicited assistance by the university and library staff, web based library services should be introduced to the disabled users, creation of awareness of special library services for disabled users with the mean score of 3.4 respectively and the least recommendation with a mean score of 3.3 which is seminars, workshop, publications and promotional materials in the university.

Table 6: ***Solutions to problems encountered in the provision of ICT resources to the disabled in UNN***

S/N	SOLUTIONS	VHA	HA	MA	NA	$\bar{x}$	RANK	DECISION
1	Training of librarians based on difficulties facing disabled users	20	7	1	-	3.7	1st	AGREED
2	Enactment of law in order to force the university to have provision for the disabled	20	5	2	1	3.6	2nd	AGREED
3	People with disabilities should be included in the library system design	15	12	1	-	3.5	3th	AGREED
4	The disabled should be given unsolicited assistance by the university and library staff	16	8	2	2	3.4	4th	AGREED
5	Web based library services should be introduced to the disabled users	15	10	3	-	3.4	4rd	AGREED
6	Creation of awareness of special library services for disabled users.	14	11	3	-	3.4	4th	AGREED
7	Seminars, workshops, publications and promotional materials in the university	13	10	5	-	3.3	5th	AGREED

Discussion of Findings

The findings of this study resulted from the data gathered using the questionnaires and the observation checklist. They are organized for discussion in line with the five (5) research questions of this study. They shall thus make up the subheadings.

ICT Resources Available for the Disabled in Nnamdi Azikiwe Library, UNN

From the result gathered by the researchers using the observation checklist, the only resources that are available and functional are the Braille, audio player/recorder, audio book, screen readers, text to audio converter, Jaws screen readers and OPAC. Other ICT resources are not available. This signifies that disabled users of the library have access only a limited number of ICT resources. These resources make up the categorization of ICT resources for the disabled as given Fichten et al. (2009) to include those which help with writing quality, those that read what is on the screen, those used for scanning and optical character recognition and voice dictation resources. The availability and functionality of these resources means that such disabled persons as the blind and deaf or hard in hearing are able to have access (though to a

limited extent) to the resources of the library which are in this format.

Resources which are not available in the library include specialized keyboard, video magnifier, Windows eyes web browser, Duxbury Braille translator, speech synthesizer, e-Braille, talking web browser, touch screen computers and glare protected computer screen. The unavailability of such resources as video magnifier suggests, in the words of Chiang et al. (2005), that users will not have the ability "to enlarge text graphics across a wide range of levels". Even though Dhanarajan (2002) has opined that increasingly, ICT tools are being recognized and used to bring education and training to those individuals who are challenged in one way or another and help to overcome barriers such as instruction based only on print and dependent on sight, audio dependent on hearing, and video requiring vision.

Even though the library has Braille resources, the observation result showed that Braille printer is lacking there. The consequence of this is that the library gets to rely on external sources and, through this unsure reliance, is actually hindering the ability to meet the requirements of users. The same thing was observed by Ali (2005) as being common in African and developing countries.

Generally, these findings falls into line with that of Tella et al. (2009) who assessed secondary school teachers' uses of ICT and got the indication that respondents have access to ICTs except that they do not have access to e-mail and the Internet.

ICT Services Offered by Nnamdi Azikiwe Library, UNN to the Disabled

Based on the responses from the questionnaire the result of the study showed that the services offered by the library are access to data bank, wireless internet, online reference service, online selective dissemination of information and web online public access among the 9 services listed by the researcher. That these services are ICT-inclined rings true with Idowu & Oduwole's (2012) position that the advent of ICT has expanded the scope of these services and the tools of information delivery.

Lathouwers, de Moor & Didden (2009) argued that technology such as internet provides opportunities to communicate with the outside world, in spite of impairments thereby expanding the world of disabled people, yet this study indicates that there is a certain level of discrimination in services to the disabled in the library according to the available library services. This may be because persons with disabilities are often invisible in policies' formulation process and statistics. Even when they are visible, their visibility is limited to persons with disability within medical meaning (Boshe, 2013). For example, WHO (2002) notes that whereas those with other kinds of disability may be catered for adolescents with a physical disability often experience many restrictions in daily life, such as in self-care, mobility and communication activities. This has in many ways hindered their full participation in academic activities.

Extent of Use of ICT Resources by the Disabled in UNN

This research question was used to elicit responses from the disabled users as to the extent to which the ICT resources in the library are used by them. Based on the data collected through the questionnaires, it is found that some ICT facilities such as speech synthesizers, electronic text, and audio books are used at a great extent just as Tella et al. (2009) stated that the use of ICTs in Nigeria and African countries generally is increasing and dramatically growing.

The study further shows that majority of the ICT resources contained in the list are used at little extent. This may be because of the issue with accessibility because according to Aina (2011) accessibility determines the speed at which an information output in any formats is obtained. Result shows that none of the resources are used at very great extent. The reason for this low use of ICT may be because teachers lack experience with ICT, lack technical and educational support, and experience a shortage of time and equipment (Vavik et al., 2010)

Level of Relevance of ICT Resources by People with Disabilities in UNN

On the issues of the relevance of the listed electronic resources the respondents favored all the items to be relevant except screen a reader which is perceived to be strongly relevant. This goes to show that technology is needed greatly to respond to a diverse range of needs of the disabled and their inclusion as it has been established that the useful user perceives a particular technology the better they engaged in its use (Keller et al., 2001; Davis et al., 2010).

Such inclusion is needed to ensure wide representation of potential users. Other studies such as Ali (2005), Okello-Obura & Magara (2008) and Jagboro (2003) agree that ICTs are implemented on the assumption that uptake of electronic resources is highly desirable in that it leads to increased productivity of work, learning, teaching and research. For instance, Tella et al. (2009) reports that teachers perceived the use of ICT as being very useful in their teaching and similarly contributing a lot to the performances of the students. From this study, I was found out that the areas of relevance of available ICT for the disabled in this library is not far from UNESCO's (2006) categorization of ICT uses into compensation uses, didactic uses and communication uses.

Solutions to Problems Encountered in the Provision of ICT Resources to the Disabled in UNN

From the result obtained in Table 6, it is clear that most of the suggestions made were accepted by the respondents as viable. In order of ranking the findings indicates that training of librarians based on the difficulties facing disabled users is perceived first as the recommendation indicated by the respondents, secondly enactment of law in order to force the university to have a provision for the disabled in this regard the National Assembly should enact a library Act that will compel libraries to make adequate provisions for the needs of disabled users, thirdly people with disabilities should be included in the library systems design in essence the respondents supported the view that the needs of the disabled should be included in the system that will facilitate universal accessibility and usability. These are in line with Boshe's (2013) suggestion that persons with disability require consideration in terms of supportive technology such as the provision of text relays and other translation bureau services if they are to have equitable access to ICTs. Without this, access and usage may not be attainable regardless of whether ICT services are readily available in a country or area.

In order of ranking, solutions recommended which are the disabled should be given unsolicited assistance by the university and library staff, web based library services should be introduced to the disabled users, creation of awareness of special library services for disabled users in the ranking came 4th respectively. The disabled should be given compulsory and unsolicited assistance by library staff. Dequin (1983) argues that librarians need not have extensive medical knowledge but should be familiar with the basic characteristics of the primary handicapping conditions. Understanding how a particular disability may affect a patron's use of library materials and services may help a staff member respond appropriately. Lastly the solution recommended by the respondents is that there should be seminars, workshops, publication and promotional materials in the university.

Recommendations

Based on the problems revealed in the course of this study, the researcher makes the following recommendations to enhance availability and use of ICT resources for people with disabilities in Nnamdi Azikiwe Library, UNN:

1. The departments of Electronic Engineering and Computer Science should be commissioned to design various software which would enable disabled users to access available technology with little or no difficulty;
2. The existing library facilities should be redesigned and modified with new technologies so as to enable mobility-challenged users to effectively and efficiently use library resources;
3. Library staff and librarians should be re-trained and re-oriented to ensure that no one is discriminated against in terms of provision of access to all library resources;
4. The library should adopt e-Accessibility Guidelines from such professional organizations as IFLA;
5. Each library should establish a committee headed by a senior academic librarian to ensure that disabled users are not discriminated against.

Conclusion

The uneven availability of Information and Communication Technology (ICT) among the disabled as compared to the non-disabled has highlighted a digital divide that separates students who are able to access electronic resources from those who have no opportunity to do so. Empirical evidence on disabled users in University of Nigeria, Nsukka, South East Nigeria has demonstrated that despite the rapid innovations in communication technology which

have drastically transformed services in the libraries some people, mostly the disabled, are at a severe disadvantage in accessing electronic resources. The division has the potential to enlarge the existing educational gap between the disabled and non-disabled students. It may be well to conclude with the observations of Vanderheiden in Keller et al. (2001) who wrote that ensuring that information system are accessible and usable for a range of users, including those with disabilities, is not an easy task and requires co-operation between a number of stakeholders. Operating system provision, application software developers, hardware developers, assistive technology providers and website developers all have a responsibility to contribute to the pursuit of accessible information systems, particularly for the disabled.

References

Adamu, A.V. (2004). *Computer Application and Use of ICT for teaching and Learning.* A Workshop paper presented at the "Train the Teacher" Workshop or capacity building for lecturers in Colleges of Education in Nigeria Akwanga.

Adima, E. E., Ladipo, S. O. & Abosi, C.O. (1981). *Introduction to Special Education.* Ibadan: Heinemann Educational Books.

Aina, R.F. (2011). *Foundation of Information studies.* Lagos: Emaphine Reprographics Ltd.

Ali, N. (2005). The use of electronic resources at IIT Delhi Library; a study of search behaviours. *The Electronic Library, 23(6)*: 691-700.

Babalola, Y. T. & Yacob, H. (2011). Library and Information Services to the Visually Impaired-The Role of Academic Libraries. *Canadian Social Science, 7(1)*: 140-147.

BBC English Dictionary (n.d.). London: Collins CoBUILD.

Boshe, P. (2013). eAccessibility for Persons with Disability in Tanzania: An Assessment of Policy and Legal Frameworks. *Open University Law Journal, 4(1):*100-114.

Brickman, L. & Debra, J. R. (Eds.) (1998). *Handbook of Applied Social Research Methods.* California: Sage Publications.

Celebic, G. & Rendulic, D. I. (2011). *ITdesk.Info – Project of Computer E-Education with Open Access: Basic Concepts of Information and Communication Technology*. Zagreb: Open Society for Idea Exchange (ODRAZI).

Chiang, M. F., Cole, R. G., Gupta, S., Kaiser, G. E., & Starren, J. B. (2005). Computer and World Wide Web Accessibility by Visually Disabled Patients: Problems and Solutions. *Survey of Ophthalmology, 50(4)*: 394-05. Retrieved on 6th September, 2014 from http://www.sciencedirect.com/science/article/pii/S0039625705000421

Chiang, M. F., Cole, R. G., Gupta, S., Kaiser, G. E., & Starren, J. B. (2005). Computer and World Wide Web Accessibility by Visually Disabled Patients: Problems and Solutions. *Survey of Ophthalmology, 50(4)*: 394-05. Retrieved on 6th September, 2014 from http://www.sciencedirect.com/science/article/pii/S0039625705000421

Cigno, R. L. (2009). *Definition of Reliability*. Retrieved ON 9th September, 2014 from http://disi.unitn.it/locigno/didattica/PE/05-06/Support_Lez01.pdf

Davis, M., Dautenhahn, K., Powell, S., & Nehaniv, C. (2010). Guidelines for researchers and practitioners designing software and software trials for children with autism. *Journal of Assistive Technologies, 4 (1)*: 38-48.

Dequin, H.C (1983). *Librarians serving disabled children and young people*. Boston Littleton Co.

Dhanarajan, G. (2002). Objectives and Strategies for Effective Use of ICTs. In *Technologies for Education*. Retrieved on 7th August, 2014 from http://www.ictinedtoolkit.org/usere/library/tech_for_ed_chapters/05.pdf

Ekwelem, V. O. (2013). Library Services To Disabled Students in The Digital Era: Challenges For Outcome Assessment. *Library Philosophy and Practice (e-journal). Paper 970*. Retrieved on 10th September, 2014 from http://digitalcommons.unl.edu/libphilprac/970

ESCAP (2000). *Are ICT Policies Addressing Gender Equality?* Retrieved on 8th August, 2014 from http//www.unescaporg/wid/04/wideresources/11 wideactivities/01cctegm/backgoundpaper

Etonyeaku, E. A. C. (2009). Incorporating information and communication technology into business education curricula in Nigeria tertiary institutions. *International Journal of Education Research 9(2)*.

Fichten, C. S., Ferraro, V., Asuncion, J. V., Chwojka, C., Barile, M., Nguyen, M. N., Klomp, R., & Wolforth, J. (2009). Disabilities and e-Learning Problems and Solutions: An Exploratory Study. *Educational Technology & Society*, *12* (4): 241–256.

G8 Nations (2000). *Okinawa charter on the global information society*. Retrieved on 8th September, 2014 from http://www.dotforce.org/reports/itl.html

Idowu, A. O. & Oduwole, A. A. (2012). Electronic Resources Provision and Internet Accessibility

Challenges in Nigerian Academic Libraries. *Global Journal of Library and Information Sciences, 1(1)*: 1-7 Available online at http://www.globalresearchjournals.org/journal/?a=journal&id=gjlis

Jagboro, K. O. (2003). A study of Internet Usage in Nigerian Universities: A case study of Obafemi Awolowo University, Ile – Ife, Nigeria. *First Monday,l8(2).* Available online at http://Firstmonday.Org/Issues/Issue8_2/Jagboro/Index.html

Katukoori, V. M. (2006). *Standardizing Availability Definition.* Retrieved on 10th September, 2014 from http://www.plant-maintenance.com/articles/Availability_Definition.pdf

Keller, S., Brairhwait, R., Owens, S. Smith, K. (2001). Towards Universal accessibility: including users with a disability in the design process. ACIS 2001 Proceedings Paper 51.

Lathouwers, K., de Moor, J. & Didden, R. (2009). Access to and use of internet by adolescents who have a physical disability: a comparative study. Res. Dev. Disabil., 30(4): 702-711.

Leonardi, M., Bickenbach, J., Ustun, T. B., Kostanjsek, N. & Chatterji, S. (2006). The definition of disability: what is in a name? *The Lancet*, 368(9543): 1219-1221.

Machell, J. (1996). *Library and information services for visually impaired people: national guidelines*. London: Library Association Publishing.

Mba, P. O. (1982). *Current and future trends in special education in Nigeria: A handbook on elements of special education*. Lagos: NERDC.

NG Scholars (2013). *University of Nigeria Nsukka-About UNN*. Retrieved on 22nd September, 2014 from http://www.ngscholars.com/2013/07/university-of-nigeria-nsukka-about-unn/

Obi, C. (2002). Information technology skills needed by business education teachers for effective instruction in the secondary schools in Enugu State. *The Journal of World Council for Curriculum and Instruction, Nigeria Chapter, 4(2)*: 99-106.

Okello-Obura, C. & Magara, E. (2008). *Electronic Information access and utilization by Makerere University in Uganda.* Available at http;//creative commons.org/licenses/by/2-0

Reddi, U. V. (2012). *Role of ICTs in Education And Development: Potential, Pitfalls And Challenges*. Retrieved on 7th September, 2014 from http://www.unesco.org/education/aladin/paldin/pdf/course01/unit_13.pdf

Rodriguez, D. & Wilson, S. (2000). *Are Poor Countries Losing the Information Revolution?*. Report from the World Bank infoDev Working Group

Soderstrom, S. (2009). Offline social ties and online use of computers: A study of disabled youth and their use of ICT advances. *New Media & Society*, 11(5): 709-729.

Star Africa (2014). *University of Nigeria Nsukka*. Retrieved on 23rd September, 2014 from http://en.starafrica.com/education/university-of-nigeria-nsukka.html

Stendal, K. (2012). How do people with disability use and experience virtual worlds and ICT: A literature review. *Journal of Virtual Worlds Research, 5(1)*: 1-17.

Tella, A., Tella, A., Toyoba, O. M., Adika, L. O. & Adeyinka, A. A. (2009). An Assessment of Secondary School Teachers Uses of ICT's: Implications for Further Development of ICT's Use in Nigerian Secondary Schools. *Tojet, 6(3)*: 5-17.

UNESCO (2006). *ICTs in Education for People with Special Needs*. Moscow: UNESCO Institute for Information Technologies in Education.

United Nations (2013). *The ICT Opportunity for a Disability-Inclusive Development Framework. Synthesis*. Report of the ICT Consultation in support of the High-Level Meeting on Disability and Development of the sixty-eighth session of the United Nations General Assembly. Retrieved on 14th August, 2014 from http://www.itu.int/en/action/accessibility/Documents/The%20ICT%20Opportunity%20for%20a%20Disability_Inclusive%20Development%20Framework.pdf

Vavik, L. et al. (2010). *Skolefagundersøkelsen 2009 (The study of school subjects 2009)*.Høgskolen i Stord/Haugesund: HSHrapport.

West's Encyclopedia of American Law, 2nd ed. (2008). Washington DC: West Group Publishing.

WHO (2002). WHO-FIC Collaborating Centre (2002) International Classification of Functioning. The Netherlands: Bohn Strafleu van Logum.

World Bank (2006). *The World Bank Information and Communication for development: Global trends and policies*. Washington DC: The World Bank.

Yeo, R. (2005). *Disability, Poverty and the New Development Agenda*. Retrieved on 9th September, 2014 from www.disabilitykar.net/docs/agenda.doc