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ICT Use in Information Delivery to People with Visual Impairment and on Wheelchairs in Tanzanian Academic Libraries

Rebecca M. Majinge
Institute of Financial Management
Dar es Salaam, Tanzania
majinge@yahoo.com.

and

Christine Stilwell
School of Social Sciences
University of KwaZulu-Natal
Private Bag X01, Scottsville 3209
Pietermaritzburg, South Africa
stilwell@ukzn.ac.za

Abstract

This paper investigated the role of Information and Communication Technologies (ICTs) in information delivery for people with visual impairment and on wheelchairs in Tanzanian academic libraries. A pragmatism paradigm and the social model of disability of Oliver were employed using both quantitative and qualitative methods. Questionnaire, interview schedules and an observation checklist were used to collect data. The study population comprised library directors, other professional library staff, disability unit staff, people with visual impairment, and on wheelchairs and staff from the Ministry of Education's Special Needs Unit. A sample of 196 respondents was surveyed. The study found that ICTs facilitated information provision for people with these disabilities but that there was no adaptive or assistive equipment in Tanzanian academic libraries for them. Academic libraries should install assistive ICT equipment to facilitate information delivery easily, independently and remotely to people with visual impairments and in wheelchairs.

Keywords: ICTs, Information delivery, People with visual impairments, People in wheelchairs, Academic libraries, Tanzania, Social model of disability.

Introduction

The delivery of information services to people with visual impairment is an essential factor in interaction, development and progress in the life of human beings (Lucky and Achebe, 2013). These authors further claim that information services delivery to people with visual impairment requires the use of Information and Communication Technologies (ICTs) for analysis, processing, manipulation, storage, retrieval, transmission and communication of data in different forms. ICTs are any product, instrument, equipment or technical system used by a disabled person, especially produced or generally available, preventing, compensating, monitoring, relieving or neutralizing disability (Schiemer and Proyer, 2013).

Delivery of services via ICTs helps patrons to cope with the global explosion of information and knowledge. Chaputula (2012) observes that ICTs are commonly used tools for information gathering, processing, storage, retrieval, and dissemination in the emerging knowledge economy, particularly in advanced information societies. ICTs offer new opportunities for everyone but these opportunities are more significant for people with disabilities, as they use technological assistance for daily activities to a greater extent than their able-bodied counterparts.

People with visual impairment have particular requirements when accessing information that needs to be met. Access to electronic and print resources can be a challenge for people with visual impairment as these information resources are usually available in a format that is not suited to them (Harris and Oppenheim, 2003). With technological equipment adapted to the abilities of everyone, that is universal

access, as motivated by the social model of disability of Oliver (1990), people with disabilities should be able to access information and participate in all aspects of social life on more equal terms than ever before. D'Aubin (2007:193) is of the view that ICTs need to be accessible so that people with disabilities experience the benefit of modern technology. Eskay and Chima (2013) recommend designing various types of software which would facilitate access, with little or no difficulty for people with disabilities, to the available technology.

ICTs can also play a wider role, enabling inclusion and social participation (Phipps, 2000). ICTs that are accessible enable people with disabilities to participate in all activities in their communities (D'Aubin, 2007). It is vital for people with disabilities to benefit, on an equal basis, from the rapid development of ICTs to allow them to enter an inclusive and barrier-free information society (Walterova and Tveit, 2012). Nkansah and Unwin (2010) highlight the finding that ICTs help to meet the needs of people with visual impairment by expanding the scope of information accessibility and increasing the rate of access to information for this group. Jaeger (2008) cited in Jaeger (2009) points out that for ICTs to be accessible, equal access should be provided to all users and compatibility with assistive technologies such as narrators, scanners, an enlargement function, voice-activated technologies, and other assistive devices should be ensured.

Assistive technology refers to the hardware and the software which have been developed to aid those with a disability which might otherwise prevent them from making full use of ICTs (Cahill and Cornish, 2003). For Akakandelwa, Stalone and Adibo (2012), assistive technology includes all devices developed to assist people with disabilities in performing tasks that might be difficult or impossible for them to achieve. This technology involves mobility devices such as walkers, wheelchairs and electric scooters, as well as communicative equipment such as hardware, software and peripherals to assist hearing, speaking and motion-impaired populace.

Academic libraries, as the life blood of higher education institutions (Okiy, 2012) can benefit tremendously from the facilities provided by ICTs (Ogunsola and Aboyade, 2005). For Myhill (2002), providing access to information for all users, irrespective of their physical disabilities, is a requirement for all libraries, and ICTs can be used to achieve this. This move towards the provision of services that are available to everyone equally, that is, universally accessible to all, has seen a remarkable shift in the information resources that are offered in many libraries and information resource centres. Therefore, the application of ICTs is very important in information delivery for people with visual impairment and in wheelchairs in academic libraries. ICTs facilitate independence, convert information resources to the format suitable for people with visual impairment, and help people with visual impairment and in wheelchairs to access information resources remotely rather than having to go to the library physically.

Motivated by this problem of providing universal access, and in particular access to information for these two groups of users in higher education, the study set out to investigate the role of ICTs in information delivery to people with visual impairment and in wheelchairs in academic libraries in Tanzania. This study is drawn from a larger doctoral study (Majinge, 2014), an overview of which is provided in Majinge and Stilwell (2014).

Objectives of the Study

The objectives of the aspects of the study upon which the article is based were to:

- examine whether ICTs facilitate information delivery to people with visual impairment and on wheelchairs.
- find out what assistive equipment is available in academic libraries in Tanzanian higher education.

Literature Review

The social model of disability by Oliver (1990) provided the theoretical framework and model for this study. Oliver's model is grounded in the principles of the United Kingdom's (UK) Union of the Physically Impaired Against Segregation (UPIAS) which was founded in the mid-1970s. This model is also endorsed by the UK's Society of College, National and University Libraries' (SCONUL) Access Working Group (Robertson, 2012). The model entails the recognition that people are disabled

by social barriers which may be physical, or attitudinal or behavioural: "If no barrier exists, then a person with an impairment is not prevented from using services" (Robertson 2012). The model presupposes universal access to libraries, achieved, among other things, by practical measures such as the construction of ramps alongside stairs, installing automatic doors, providing information in Braille and large print, and providing assistive technologies such as Closed Circuit Television (CCTV), Braille embossers, screen magnification and screen reading software like JAWS (Shava, 2008).

Dragoicea, Sacala, Cojocaru, Shivaron and Balan (2009) assert that the aim of assistive technologies in Oliver's (1990) model is to overcome the gap between what people with disability intend to do and what the existing social infrastructure allows them to do. To support this statement, Adam and Kreps (2006) see availability and appropriate technology an integral part of the social model of disability. Dragoicea et al. (2009) further claim that the social model is the driving force behind recent improvements in access and that the tools of assistive technologies could enhance social inclusiveness. Similarly, Sheldon (2001) declares that the social model sees technology as enabling people with disability to be included in the mainstream of social and economic activity through the removal of disabling barriers.

ICTs are a vital resource in this era. They facilitate effective information transfer and access through various devices. Eskay and Chima (2013) support this assertion by stating that due to advances in ICTs, information is now available in different formats that can be accessed through various media. ICTs are becoming faster, easier to use, and more widely accessible on campuses, in libraries and learning centres, in workplaces and in homes (Bridgland and Blanchard, 2001). ICTs now have the capacity to take services to individuals who find it difficult to visit such centres because they live in geographically remote areas, have disabilities, are home-based for other reasons, or are occupied during the centres' opening hours (Watts, 2001). With the growing importance of ICTs, equal access to electronic information and services has become an important area of concern for social justice for those who have been marginalised in other areas of society (First and Hart, 2002 cited in Jaeger, 2006). Yoon and Kim (2012) insist that libraries must exist as social facilities that actively support persons with disabilities in their social participation and help them lead more comfortable lives. Tilley, Bruce and Hallam (2007) support this assertion by stating that "using appropriate assistive technology; libraries can improve information access and quality of life for large numbers of their patrons."

Today ICTs are being used as tools for improving efficiency and enhanced effectiveness in life to people with disabilities. Similarly, Dobransky and Hargittai (2006) declared that ICTs have been viewed as tools that enable people with disabilities to escape the isolation and the stigma that sometimes accompany their disabilities. In a similar way, Vicente and Lopez (2010) point out that ICTs help people with disabilities to eliminate many of the disabling barriers that impair or completely prevent them from participating in many activities. In the same vein, Ali (2008) claims that people with different kinds of disabilities are now able to communicate with each other and learn through the tools available for the purpose through ICTs. Eisma, Dickinson, Goodman, Syme, Tiwari and Newell (2004) note that ICTs are increasingly used by, and perceived as useful for, a diverse group of non-typical users, including older and disabled people.

Babalola and Haliso (2011) claim that libraries do take advantage of advances in ICT to increase information access for people with visual impairment. In addition, a broad range of assistive technologies such as CCTV, Braille embossers, screen magnification and JAWS are now available to provide access to information in electronic databases and on the internet, giving users with visual impairment opportunities equal to those of the sighted. In a similar way, Heiman and Shemesh (2012) indicate that assistive technologies offer alternative formats which relate to academic needs such as reading, writing and calculation.

Assistive technologies are prerequisites for people with visual impairment to access information resources housed in academic libraries. Rout (n.d) also claims that assistive technologies are essential for helping students with various disabilities to succeed in their studies. In the same vein, Wolfe and Lee (2007) cited in Heiman and Shemesh (2012) claim that using the different facilities of assistive technology programs may increase the independence

of students with learning disabilities, facilitate learning, raise motivation for active participation in their academic studies, and encourage the students with learning disabilities to acquire and develop compensatory strategies for coping with difficulties.

Methodology

This study was conducted within a pragmatism paradigm. The intention was to address the problems which people with visual impairment and on wheelchairs face in accessing information in Tanzanian higher education institutions by applying various suitable approaches to data gathering. Both quantitative and qualitative methods were used. The study was conducted in three administrative regions: Dar es Salaam, Dodoma and Tanga. In these regions, five universities were studied: University of Dar es Salaam (UDSM), Open University of Tanzania (OUT), Dar es Salaam University College of Education (DUCE), Sebastian Kolowa Memorial University (SEKOMU) and St. John's University of Tanzania (SJUT). In addition, the Special Needs Education Unit for Disabilities at the Ministry of Education and Vocational Training was included in the study. These five large Tanzanian universities agreed to participate in the study. Data collection took place from 30th September to 31st December, 2012 which allowed the primary researcher to visit all of the institutions.

The study involved 196 respondents, comprising library directors, other professional library staff, disability unit staff, and people with visual impairment and on wheelchairs. People from the Ministry were included through staff members from the Ministry's Special Needs Education Unit. The criterion for the choice of the latter respondents was that they were involved with policy formulation, budgeting, training and provision of information materials and equipment for people with disabilities in all schools and higher learning institutions in the country. In addition, various universities' disability unit populations were included in the study. Snowball sampling was used to identify the people with visual impairment and on wheelchairs because the researcher was not able to establish the actual disability population of the universities in advance. This sampling approach was employed to ensure that a suitable proportion of 57 library users with visual impairment and 6 users on wheelchairs was reached.

Questionnaires, interview schedules and an observation checklist were used to gather data. Data gathered through questionnaires were analysed using descriptive statistics facilitated by SPSS, and data gathered through interviews were analysed using thematic analysis.

Table 1 below indicates that of the 139 library staff who were expected to participate in the survey, 113 (81%) library staff actually completed and returned the questionnaire from all the universities surveyed in Tanzania.

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Table 1: Population of library staff (N=139)

SN	University	Library Staff		% response
		Expected respondents	Actual Respondents	
1	UDSM	77	66	47%
2	DUCE	24	17	12%
3	OUT	18	13	9%
4	SJUT	13	11	8%
5	SEKOMU	7	6	5%
Total		**139**	**113**	**81%**

Source: Field data (2012)

Table 2 below presents the breakdown by institution relating to the 76 people with visual impairment and on wheelchairs who were expected to participate in interviews or to complete a questionnaire and the 63(83%) people with visual impairment and on wheelchairs who were interviewed and completed a questionnaire in all the universities surveyed in Tanzania.

Table 2: Population of people with visual impairment and on wheelchairs (N=76)

SN	University	People with visual impairments and in wheelchairs		% response
		Expected respondents	Actual respondents	
1	UDSM	27	26	34%
2	DUCE	10	9	12%
3	OUT	20	10	13%
4	SJUT	2	2	3%
5	SEKOMU	17	16	21%
Total		**76**	**63**	**83%**

Source: Field data (2012)

Table 3 below, indicates that of the 19 disability unit staff who were expected to participate in the survey 15 (78.9%) staff actually completed and returned a questionnaire from the Ministry of Education and Vocational Training and all the universities surveyed in Tanzania.

Table 3: Population of disability unit staff (N=19)

SN	University	Disability unit Staff		% response
		Expected respondents	Actual Respondents	
1	UDSM	3	3	15.8%
2	DUCE	3	3	15.8%
3	OUT	3	1	5.2%
4	SJUT	-	-	-
5	SEKOMU	5	5	26.3%
6	MoEVT	5	3	15.8%
Total		**19**	**15**	**78.9%**

Source: Field data (2012)

In addition, five (100%) directors of academic libraries from five universities in Tanzania were interviewed.

Findings and Discussion of the Results

The results are presented and discussed in the sections that follow. The results focus on the availability of the ICTs and whether ICTs facilitate information access for people with visual impairments and in wheelchairs in academic libraries in Tanzania.

The Role of ICTs in Information Delivery for People with Visual Impairment and on Wheelchairs

Library staff were asked whether ICTs assist people with visual impairment and on wheelchairs with information delivery in academic libraries in Tanzania. Responses show that 102 (90%) out of the 113 respondents responded positively while eleven (10%) responded negatively.

The same question was posed to people on wheelchairs: whether ICTs assist access to the information needed. All six (100%) people on wheelchairs responded positively, indicating their view that ICTs assist them in accessing information resources. In addition, those who responded Yes were asked to explain how ICTs facilitate access to information. They explained that ICTs facilitate easy retrieval of information, as well as remote access to information.

People with visual impairment were also interviewed using an interview schedule about whether ICTs facilitate information access for them. All fifty-seven (100%) responded positively to indicate that ICTs helped them to access information . They explained that ICTs allow them to access information easily and independently, and also convert information into a suitable format.

Assistive Equipment Available in Academic Libraries

Library staff were asked to indicate whether the adaptive or assistive technology is available in academic libraries in Tanzania. Responses from the 113 are shown in figure 1. A total of 76 respondents (67.2%) responded in the negative; 18(15.9%) indicated a tape recorder; 6 (5.3%) mentioned a Braille printer; 5 (4.4%) said a scanner/reader; 5 (4.4%) identified screen enlargement; and 3 (2.6%) indicated CCTV.

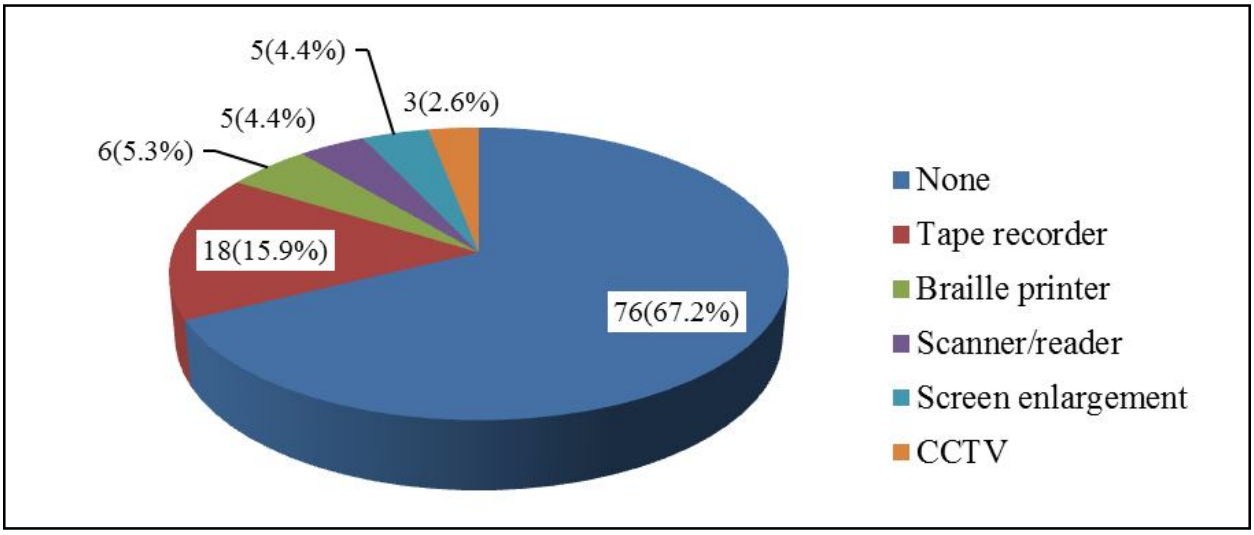

Figure 1: Adaptive equipment or technology available in the library: library staf responses (N=113) (Source: Field data, 2012)

People with visual impairment were interviewed to establish whether the library provided any assistive equipment to them. Despite the positive responses of the library staff on the availability of equipment mentioned by them, all 57 respondents (100%) with visual impairment responded negatively to indicate that libraries did not provide any assistive equipment, except for the one small exception noted in the last two lines in this paragraph. In addition, it was observed by the primary researcher that despite the positive responses from some of the library staff on the availability of assistive or adaptive equipment, the findings showed that the assistive or adaptive equipment available in all universities surveyed was in the disability units which were provided by the schools of education and not in the library. Only one library among the five academic libraries investigated had one type of assistive device in the form of audio tapes.

The findings relate to those of Bagandanshwa (2006) who notes that the required technologies were not available in Tanzania, both assistive and adaptive technologies were neither manufactured in the country nor were there local dealers. This lack of manufacturers made the devices difficult to purchase. When they are available, they are sold at exorbitant prices (Bagandanshwa, 2006). Vicente and Lopez (2010) point out that ICT equipment is much more expensive for people with disabilities of all types and they have to incur extra costs associated with their impairments. Similarly, Harris and Oppenheim (2003) agreed that assistive equipment and software can be extremely expensive and the benefit will be potentially to a small number of students.

Seyama (2009) noted that the University of KwaZulu-Natal (UKZN) Library computers at that time did not have a JAWS program, therefore the students had to use the local area network (LAN) rooms each time they needed information from the database. Walterova and Tveit (2012:346) also observed more generally that ICTs are still not available to all on equal terms. About 30 to 50 per cent of Europeans still get no benefit from ICTs and millions are at risk of being left behind in the emerging information society.

Conclusion

The study concluded that ICTs facilitate information delivery to people with visual impairment and on wheelchairs easily, independently, remotely using sources. In addition ICTs are an enabler of access by students to learning which increases motivation, confidence, their self-esteem and enhances their independence.

Recommendation

Despite the findings of this study and other similar studies which indicate that ICTs facilitate information delivery to people with disabilities, access in the Tanzanian university libraries studied is far from universal. These academic libraries need to convert information resources into formats which are suitable for people with visual impairment. In addition, people with visual impairment and on wheelchairs need specialised services or adaptive equipment to access and use information resources housed in the library and remotely from their homes. This provision of access, the installation of software like JAWS and other related software, as well as training on how to use assistive equipment, are needed urgently.

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Rebecca M. Majinge is an assistant librarian at the Institute of Finance Management, Dar es salaam, Tanzania. She holds a PhD from the University of KwaZulu-Natal, Pietermaritzburg campus, South Africa.

Christine Stilwell is Emeritus Professor and Fellow, School of Social Sciences, University of KwaZulu-Natal (UKZN). She was Head of the Information Studies Programme from 2003- 2007 and Acting Director of the Centre for African Literary Studies UKZN from 2011- 2013.