

Access and Support of Assistive Technology for People with Visual Impairments in Open and Distance Learning Institutions (O.D.L) In Zimbabwe

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Abstract

This study focused on access and support of assistance technology for people with visual impairments in open and distance learning (ODL) institutions in Zimbabwe with particular focus on Zimbabwe open University (ZOU). Access to education and support for people with visual impairments in open and distance learning institutions in Zimbabwe appears to be a relatively grey area. The aim of the study was to analyse access and support of visual impairment in ODL for the improvement of ODL through assistive technology. The study was done through a qualitative design which composed of questionnaires to get data from people with visual impairments. Convenience sampling was used to identify respondents from among visually impaired individuals. Assistive technology refers to gadgets and devices such as modern computer software, magnification software, video and audio presentations, audio descriptions, verbal description of visual content, Braille embossers, large print word processors, screen readers and portable note taking devices. This assistive technology is conspicuous by its absence. The study shows that traditional technologies in ODL like the print media (for example modules) and radio appear to be non-existent as well. Large print materials are not available. Braille machines and Braille paper are in short supply. Specialist personnel to help those with visual impairments also appear to be inadequate. Simple innovations like talking books are not available. These shortcomings tend to have far reaching implications on the educational benefits accruing to people with visual impairments. Access to assistive technology should be a right and not a privilege. Individuals with visual impairments appear not to be benefiting from existing provisions. These findings are important to current and future scholars, educational and academic institutions, policy makers, non-governmental and private organisations, national, regional and international communities. The study leads to appropriate understanding of visual impairments, needs of visually impaired people in ODL, opens opportunities for further research and enactment of policies to change the functionings and acceptability of visually impaired people in ODL institutions and wider society. The study led to the recommendation that comprehensive legislation should be enacted to ensure unconditional access to modern assistive technology by people with visual impairments.

Keywords: braille, embossers, screen readers, speech recognition, assistive devices, assistive technology.

INTRODUCTION

Recent years have witnessed phenomenal growth and expansion in terms of assistive technology, access and support in higher education for sighted people. This is commendable. Regrettably this expansion appears not to have been extended to individuals with visual impairments in ODL institutions of higher learning. Assistive technology has been an agent of transformation in people's lives. Learners with visual impairments have not been part and parcel of the list of beneficiaries in accessing assistive technology and support from through ODL institutions. There is great potential for empowerment and advancement of people with visual impairments. In the absence concerted efforts from ODL institutions, access to the internet for example could remain a pipe dream for a

very long time for people with visual impairments. Technology – mediated teaching and learning has been known to permeate all levels and locations. Failure to access relevant assistive technology leads to high social costs such as high unemployment for people with visual impairments. It was the contention of this study that unavailability of assistive technology disadvantages learners with visual impairments to unprecedented levels.

BACKGROUND TO THE STUDY

Students who are visually impaired have numerous difficulties in accessing education and training and assistive technology. One of these difficulties is that they are unable to read ordinary print and experience problems in seeing various sized text. This will call

for the need to enlarge reading or written material. This may also bring in the need to transcribe the information into Braille. Mathematical calculations and interpretation of especially large amounts of data are another hurdle. They also cannot easily access diagrammatic representations the way sighted people do. Some have been barred from doing programmes of their choice.

Libraries in ODL institutions did not have talking books, let alone Braille books. Neither was there user friendly software to enable access to such a critical human right. Librarians were not trained to assist people with visual impairments either. Examinations were fraught with various irregularities and challenges. Some of these involve lack of knowledge on what has to be done for them to access the examinations effectively. This covers time allocation, procedural inconsistencies, questioning techniques, knowledgeable examiners and provision of all the necessary needs that enable full compliance and completion of the examinations in questions.

The challenges alluded to above were not insurmountable. While a visually impaired learner may not be able to use a computer monitor he / she can definitely access information via computers through learning or touch with the aid of assistive technology such as screen readers or Braille displays. This is made possible because a number of accessibility features are built into windows and other Microsoft products that make it possible to be used by people with visual impairments. Personalising one's computer to enable effective use or finding demos and tutorials to make it easier to see items on the screen could be explored. In addition to this other options can be exploited to alleviate the plight of individuals with visual impairments on accessing assistive technology.

Against this background this study was targeted at determining the extent to which individuals with visual impairments accessed assistive technology and support for education in open and distance learning (ODL) institutions of higher learning.

STATEMENT OF THE PROBLEM

To what extent have open and distance learning (ODL) institutions of higher learning in Zimbabwe been able to accommodate visually impaired learners in terms of assistive technology.

RESEARCH QUESTIONS

- What assistive devices are available for people with visual impairments in ODL institutions of higher learning?
- In what forms have study materials such as books, tutorial letters and the actual tutorials been availed to students?

- What difficulties have been experienced by learners with visual impairment due to limitations in accessing assistive technology?
- What needs to be done to improve accessibility to assistive technology for people with visual impairments?

SIGNIFICANCE OF THE STUDY

The study is of great significance to a variety of individuals and organisations. These include visually impaired people, educational and academic institutions, scholars, policy makers, non-governmental organisations, current and future researchers, the general national and international community. The study will lead to greater understanding of visual impairments particularly their types and effects on the social and economic functionings of visually impaired people. Moreover, appropriate understanding of visual impairments will facilitate appropriate understanding of the needs of visually impaired people.

Current and future scholars may use the study findings as literature review. Opportunities for further understanding of visual impairments in ODL and appropriate assistive technology may be explored by scholars on the basis of this study. Furthermore, educational and academic institutions may programme curricula and structure student needs for assistive technology on the basis of real experiences of people living with visual impairments.

The wider society may also benefit from the study. Understanding of people living with visual impairments and their needs may facilitate smooth interaction in society. Non Governmental Organisations (NGOs), private and public organisations in the disability sector will plan, implement, monitor and evaluate their projects and programmes on the basis of appropriate knowledge generated from this study. Furthermore, policy makers may formulate sensitive policies that are appropriate for both visually and non-visually impaired people at national, regional and international levels.

LIMITATIONS OF THE STUDY

The researchers experienced challenges in conducting the study. However, the limitations were anticipated in advance therefore strategies for managing the limitations were crafted. Reaching visually impaired students was a challenge due to the ODL nature of the Zimbabwe Open University. However, the researchers reached out to the visually impaired students during periods for tutorials.

The researchers also visited those visually impaired students who live in Harare and nearby regions. Visits to visually impaired students' homes and workplaces involved financial costs. The researchers

budgeted for these costs. Some of the appointments with visually impaired students and university staff had to be postponed because of busy schedules. However, the researchers planned for appointments in advance and at times appropriate to the respondents, but within the time framework of the study. The researchers also administered the questionnaires to achieve 100% response rate.

REVIEW OF RELATED LITERATURE

For many decades people with visual impairment had to rely on relatives or friends to have information read to them. One can imagine the results in cases where an aid was unwillingly to help. Bachani and Limburg (1996) define blindness as a condition where a person suffers from any of the following conditions, namely:

- Total absence of sight; or
- Visual acuity not exceeding 6/60 or 20/200 (Snellen) in the better eye even with correction lenses; or
- Limitation of the field of vision subtending an angle of 20 degree or worse. (World Health Organisation, 2010).

Assistive technology in the form of computer magnification software, video and audio presentations, audio description (verbal description of visual content) cannot be accessed easily. In Zimbabwe, it would appear that even technologies like printed modules or audio cassette were non-existent. Braille transcription services were not readily available either. Because of these glaring inadequacies even tutorial letters to students who are blind were provided as ordinary print. Assignments are also in ordinary print and not in Braille. The introduction of e-learning has worsened the plight of usually impaired students since they have not been accommodated at all. In the libraries you can hardly come across a library book in Braille let alone enlarged print. Talking books are a fallacy to say the least. There is hardly anyone to assist a visually impaired student in any meaningful way. The only other time a visually impaired student is confronted with learning material in Braille or enlarged print is when he/she writes the examination.

According to <http://ncdae.org/resources/articles/technology>, “ a faculty member who is blind will have problems participating in real-time chats of his/her online distance education course if chat function is inaccessible to his/her assistive technology such as a screen reader”. Failure to access relevant technology leads to high social costs, for example high unemployment for people with disabilities. In the United States of America the census that was held in 2000 revealed that 49,7 million Americans had a disability (that was roughly one in every 5 individuals over the age of five in the civilian non-institutionalized population). This

translated to the fact that 8,5% of the population had at least one disability that had serious implications on the need for use of the internet or a computer. Considering that several undergraduate students with visual impairment are enrolled in O.D.L institutions, this has for reaching repercussions for them in terms of accessing assistive technology.

Access to technology is a critical issue. Research has revealed that visually impaired individuals who use technology have succeeded on career outcomes since educational outcomes predict career success to a very large extent.

The challenges

Visually impaired students with low vision for example may require the services of magnification software to enlarge the content of the screen. By so doing they may be able only to view a small portion of a standard screen page at a time. This remains a major challenge involving the use of magnification for people with visual impairments. Other visual materials such as video presentations create access barriers for those who are blind in particular if the content is not also provided in text form or audio description. Too many barriers in the way of visually impaired learners were involved in open and distance learning. According to <http://w.w.w.sedtac.ed/ed/publication>, some web pages may be cluttered and make use of inconsistent formats. This has potential to make navigation and comprehension of the content extremely difficult for individuals with low vision. Visually impaired students who are color-blind also experience specific challenges. They have difficulty in accessing course materials and the appropriate navigation mechanisms that require ability to distinguish one color from another. In other words they are unable to take part effectively when the content and navigations are identifiable or distinguishable on the basis of color only, (<http://n.cam.wgbh.org/saltguidelines>).

On the other hand, we also need to appreciate the difficulties learners go through in trying to comprehend the content of the websites when the good intentions of the internet are poorly organized and screen layouts were inconsistent. Some web pages may include content that flickers in order to capture the viewers' attention. This can present discomfort on the part of the user. Some of the content can be at the rate of 2 and 55 hertz and this can trigger seizures for those who may be susceptible to the flickers (<http://www.washington.edu/doit/video/real/com.html>).

Blind participants may also resort to the use of what is called text-to-speech software. With this software there is a synthesized voice that reads aloud the text content on the screen. While this can be applauded as relevant technological advancement, the big question

is, To what extent has such software been accessible to learners with visual impairment in open and distance learning? It may be surprising that even the visually impaired learners themselves may not even be aware of such software. In addition there may be real challenges involving use of this software since some individuals with visual impairments may have other impairments such as hearing impairment. The question of the other difficulties also interfering in the use of this technology cannot be ruled out. <http://www.microsoft.com/enable/guide/vision.aspx>.

O.D.L institutions of higher learning can shop for assistance technology products that are compatible with Microsoft Windows from independent assistive technology organizations or companies. These include the following but are not exhaustive.

Screen Magnifiers – these work like a magnifying glass by enlarging a portion of the screen as the user moves the focus thus increasing legibility to users. Some screen enlargers allow a user to zoom in and out on a particular area of the screen. There are also handled magnifiers which are portable.

Screen Readers– these comprise software programmes that present graphics and text as speech. A screen reader is used to verbalize or speak on the screen, for example names, descriptions, menus, punctuation etc.

Speech Recognition (also known as voice recognition) allows for data entry by voice commands as opposed to a mouse or keyboard.

Speech Synthesizers (also called text-to-speech [T.T.S system]) these receive information going to the screen in the form of letters, numbers and punctuation marks and then speak it out loud. Speech synthesizers make it possible for the blind to review their input as they type.

Refreshable Braille Displays- these provide tactical output of information represented on the computer screen. The user reads the Braille letters with his/her fingers and then after a line is read, he/she refreshes the display to read the next line.

Braille Embossers these provide computer generated text into embossed braille output. Braille translation programmes text scanned in or generated via standard word processing programs into braille, which can be printed.

Accessibility of Assistive Technology in ODL for Individuals with Visual Impairment

Assistive technology for open and distance education in institutions of higher learning is a far cry. Very few devices are availed for use by people with visual impairments and yet tools for ODL are supposed to be accessible to all students, instructors and course designers who have a stake in the education of individuals with visual impairments.

Development of Course Materials

A number of logistical considerations need to be taken into account when developing course materials.

This is the starting point if assistive technologies are to be effective. Availability of accessible hardware and software ensures that distance education content becomes available for those with visual impairments. Accessing content alone does not make much sense. Content must also be meaningful. The procedures or technologies used to access the content must be sensitive to the real needs of the beneficiaries. Effective assistive technology can go a long way in addressing issues of accessibility of course materials.

In order to enhance accessibility, tools for open and distance learning should be availed not only to learners, but also course designers, and instructors including those with disabilities. Firstly web pages should be designed in a manner that enables effective accessibility. Course material designers need to pay strict attention to accessible designs. Guidelines on designing accessible web pages are therefore critical in this regard. An example can be that of the guidelines developed by World Wide Consortium (<http://www.washington.edu/accesit/articles>). Some state governments have developed their own web guidelines. There is serious need to take into account the issue of how teachers and students will interact. According to <http://www.sed/btac> text based resources such as Usenet, discussion groups, bulletin boards, electronic mail and distribution lists are generally accessible to students with disability. For those who are blind in particular, they will need to access a chat room or the use of a screen reader. The use of a screen reader technology heavily depends on how issues bordering on how the chat room was developed.

While in the case of the deaf it will be necessary to guarantee accessibility of video and content through captioning, for the blind audio description, that is verbal description of visual content should be made available (<http://www.washington.edu/accessit/articles>). In view of these challenges the National Centre for Accessible Media (NCAM) has developed a free software tool called the Media Access Generator (MAGPIE) (<http://www.washington.edu/access>). This software allows for multimedia specialists, publishing companies and service providers to add captions, subtitles and audio descriptions to their work. The essence of accessibility to assistive technology is therefore to strive to make all web content accessible regardless of the file format.

There is therefore serious need to develop policies, procedures effective legislation that guarantees that learners with visual impairment access learning material. Libraries in institutions of higher learning need to revisit their strategies to take on board measures that enhance material accessibility. In view of the critical role played by policies, procedures and legislative provisions, the Centre for Distance

Learning, Universal Design, Universal Access (<http://aoce.org.pubs/etr/issae2burgstawer.cfm>) advocates the following considerations:

- Ensuring that people with disability and other stakeholders are represented when accessibility policies, procedures and guidelines are developed.
- Developing a policy statement that commits organizations to champion programs services and resources that are accessible to people with disability.
- Articulating challenges of accessibility likely to be experienced by learners in the context of services, courses and resources availed as well as the requisite tools used for the subsequent delivery.
- Adopting clearly defined standards for accessibility to be reality.
- Assigning specially trained people within departments of O.D.L institutions that deal with IT accessibility to update their software to be in line with policy and guidelines.
- Liaising with legal experts in order to ensure a full comprehension of the requirements for program information as well as service accessibility as mandated for by the relevant organization or country.
- Regular evaluation of accessibility to assistive technology.
- Provision of regular and up to date training facilities and guidelines
- Disseminating IT accessibility policy guidelines in O.D.L institutions.
- Reviewing the policies and guidelines of the O.D.L institutions.

It would appear that individuals with visual impairments have been on the receiving end for too long. Critical assistive devices have not been forthcoming hence this has created a huge negative impact on their empowerment. We probably need legislative provisions to mandate provisions of assistive technology for people with visual impairment. Other strategies like public awareness and education on the needs of people with disabilities are also necessary. There is also need to shop for assistive technology products that are compatible with Microsoft Windows which are manufactured by independent assistive technology organizations.

METHODOLOGY

This study required that information required be sought from the intended beneficiaries. The essence of the study was to establish provision levels of assistive technology for those with visual impairments in ODL institutions of higher learning on those who had just gone through various programmes of their choice. Part of the information was solicited from authorities in ODL institutions. This could have brought in the risk of biased information, stemming from the fact that naturally

authorities would wish to protect their organizations and cover up for their inadequacies. In an bid to address this anomaly it was felt that most respondents needed to be the actual beneficiaries who were most affected by any shortcomings thereof. In support of this position Bell (1993) also pointed out that the survey is the method of research that links with intense accuracy at the phenomena of the moment and describes precisely what the research sees. In addition Seale (1998) also demonstrates that there is no treatment of subjects in surveys since situations are described as they are.

The study made use of a qualitative design, that is, the survey due to its relevance in situations where information of this nature was needed. According to McMillan and Schumacher (1993) as a qualitative design, the survey was good as a plan for selecting subjects, research sites and data collection procedures to answer the research questions. It also accommodates both qualitative and quantitative data in addition to describing conditions, situations and events of the present. Because of this position a relatively large number of respondents are accommodated resulting in cost effectiveness. Respondents also have the added advantage and flexibility of reflecting on their responses on the questionnaire. The population of the study comprised of visually impaired people who were currently studying at ODL institutions or had recently completed their programmes of study at ODL institutions. It also involved officials from ODL institutions. It was not possible to study the whole population hence there was need to sample. Convenience sampling was used to select the sample. Convenience sampling makes use of individuals who happen to be available at the time (Miles, 2000). This was done to avoid challenges of entrusting a questionnaire to a friend, relative, or colleague who may misplace or forget to handover the questionnaire to the targeted respondent. The sample comprised of individuals with visual impairment and officials from the institutions such as lecturers. Respondents also took part on their own volition. Confidentiality was guaranteed since it involved dealing with individuals. Anonymity of respondents was also guaranteed. Data analysis was also done in accordance with the interpretation thereof.

DISCUSSION OF FINDINGS

The findings of the study are discussed below.

Forms in which study materials were presented

On the issue of the form in which some critical study materials were presented to learners thirteen items were isolated: namely application form, tutorial letters, examination timetable, modules, tutorial timetable, library books and guidelines on assignment writing, project and practicum guidelines, writing examinations and mathematical formula and tables. It

was established that all these materials except one were presented to learners as ordinary print or hard copy meant for the sighted. The font size was for the sighted. There was no provision for enlarged print not to mention Braille. Only examinations were presented in Braille. There were no library books and periodicals in Braille nor any other information in Braille or large print. This can probably be accounted for by a number of factors. One explanation can be lack of knowledge of assistive devices on the part of ODL institutions. This could also be accounted for by the fact that there was no known section or department set aside to deal with issues to do with assistive devices. With one of the universities while there was a Department of Disability Studies such issues did not fall under its portfolio. Another dimension could be the prohibitive costs involved in adapting ordinary print to Braille although the same cannot be said of enlarged print which can be done on ordinary computers and uses a relatively reasonable amount of paper. In addition in the absence of mandatory legal and policy requirements for provision of these assistive devices institutions did not feel duty bound to do their best.

Access to Assistive Devices

The study established that from a list of nineteen modern assistive devices respondents only had access to just a few. These included computers, modern computer software, Braille machines Braille paper, talking books, audio material e.g compact discs, thermaphorm (equivalent of ordinary photocopier) Braille books, screen magnifiers, screen readers, speech synthesizers, refreshable Braille displays, Braille embossers, large print word processors, talking word processors, optical character recognition portable note taking devices and hard copy Braille. The majority of the respondents only indicated access to Braille paper, limited hard copy Braille books and some talking books. Traditional assistive devices were also in short supply. Most of the modern assistive technology was not available to learners in ODL. This position could be due to either poor funding levels or complete ignorance of the existence of these technologies. The issue of ignorance on the part of authorities could be debatable since at one of the institutions some recommendations on what could be purchased and where it can be purchased were forwarded to the authorities. These recommendations could have been allowed to gather dust on the shelves. Most of these assistive technologies have to be imported from other countries and lack of capacity to produce them locally can also be a deterrent on the part of higher education authorities. Higher costs of procurement could also have a hand in this state of affairs. Lack of commitment on the part of institutions of higher learning could also be an issue. These inconsistencies were bound to impact negatively on individuals with visual impairment.

Access to Internet

The study also found out that rarely do learners have access to the internet. One respondent who was doing a Master of Business Administration (MBA) degree only accessed the internet at his workplace, but would need assistance from an assistant who would read out the information to him. Others had to go to internet cafes to access the internet. Considering the costs involved it was not feasible to use the internet frequently. Costs involved in accessing the internet were a strong factor in the limited access to this service. Lack of knowledge about accessing the internet could also have played a part in the limited access to the internet considering that for those who are completely blind, their assistants may also have limited knowledge and capacity in using the internet in terms of finding relevant websites and using them effectively. Most internet cafes also need to be user friendly. It would appear that while there are fulltime assistants available, sometimes they are overwhelmed with clients and the set up does not offer much privacy and time for beginners or learners who need to be assisted frequently. Some clients may not wish to be exposed in terms of their capacity to use the internet.

Use of Assistive Technology for Tutorials

It was established that both fulltime and part-time tutors never used assistive technology for the benefit of learners with disability. Tutors may have limited knowledge themselves or do not have access to the assistive devices. Some may shun use of assistive devices considering that it is involving in terms of sourcing for the technology, preparation and actual delivery.

Tutors Who Were Braille Literate

The majority of tutors were not Braille literature. Only four tutors were found to be Braille literate and were in three regions. Other regions had none. This could imply that there are very few people in the country who are Braille literate or that they could be there but may not have the requisite qualifications to conduct tutorials at that level. Another dimension could also be that they may be there but are working in other sectors of the economy or other levels of the education sector such as schools or colleges.

Assistance from Peers

The study indicated that while peers were willing to help their visually impaired friends, they were also hampered in doing this by the lack of the assistive technology as well as time constraints since this was also involving and also affected the peers who assist. Another explanation could be that the peers may also have limited knowledge in using some of the gadgets in question such as the thermaphorme, screen magnifiers or speech synthesizers to mention a few.

Overall Use of Assistive Technology in ODL

The study shows that the overall utilisation of assistive technology for people living with visual impairments was inadequate. This could be due to the absence of the technology or lack of commitment and or funding on the part of ODL institutions. Lack of legislation and policy that compels ODL institutions to make use of assistive technology could also be a very strong factor. Lack of qualified personnel could also account for this position.

RECOMMENDATIONS

On the basis of the findings of the study the following recommendations are proposed that:

- ODL institutions reflect on the needs of people with visual impairments especially with a view to improve on the availability of assistive technology
- ODL institutions ensure the setting up of fully fledged departments with qualified personnel which will deal with all issues and concerns of learners with visual impairments
- There be comprehensive legislation and policies that compel ODL and other institutions to put in place strategies to avail assistive technology for learners with visual impairments
- Qualified personnel be responsible for departments in the ODL institutions with a mandate to provide for assistive technology
- Adequate funding levels be made available in order to address the need for assistive technology for people with visual impairments

CONCLUSION

The findings of this study clearly show that as a nation, our ODL institutions have done very little to provide for assistive technology for people with visual impairments. A lot still needs to be done if any meaningful changes are to be seen. There is lack of commitment, materials continue to be presented in ordinary print even when clearly unnecessary. Modern assistive technology is conspicuous by its absence. The internet remains inaccessible. There is no evidence of use of assistive technology during tutorials. Very few tutors are Braille literate. While peers were forthcoming in terms of assistance, they also had limitations in the effective use of the technology that people with visual impairments rely on. Braille machines are few. On the whole access and support for assistive devices remains a pipe dream.

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