Article

Provision of Assistive Resources for Patrons with Visual Impairment within Academic Libraries in the Midlands Province, Zimbabwe

Mthokozisi Masumbika Ncube
https://orcid.org/0000-0003-4835-6594
Zimbabwe Open University
ncubem.masumbika@gmail.com

Mercy Kurebwa
https://orcid.org/0000-0003-0728-3114
Zimbabwe Open University
mtkurebwa@gmail.com

Abstract

The study assessed the strategies that academic libraries in the Midlands Province of Zimbabwe could adopt to enhance the provision of assistive resources to patrons with visual impairment. The assessment grew out of the realisation that even though the introduction of assistive resources within academic libraries in the 20th century impacted positively on such libraries, their uptake in developing countries, including Zimbabwe, is inadequate, uninspiring, and fragmented. A qualitative research approach was adopted. The sample constituted five academic libraries that met the conceptual criteria of academic libraries in the study, 32 patrons with visual impairment, 12 library staff members, five lecturers who teach special needs education, four staff members from student services, and six Zimbabwe Library Association members who were purposively sampled. Questerviews, interviews, focus group discussions and document analysis were used to generate data for the study. The study established that the libraries faced varied challenges in providing assistive resources to the visually impaired patrons, which mostly included inadequate equipment and infrastructure, a lack of budget and financial resources, inadequate training and development, the attitude of library staff members, and a lack of national legislation. The study noted the need for the libraries to implement creative and unique solutions, which include sourcing for donations, undertaking crowdfunding initiatives or establishing public-private partnerships (PPPs). The study also underscored the need for the establishment of Disability Resource Centres in each library under study. In addition, library practitioners, through the Zimbabwe Library Association, should advocate for the establishment of national legislation that focuses on service provision to individuals with disabilities in academic institutions.

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Introduction

The study focused on the provision of assistive resources by academic libraries in the Midlands Province of Zimbabwe for visually impaired patrons. Though academic libraries in this province have several patrons with visual impairment, the provision of assistive resources remains extremely limited, inadequate, and fragmented. From 2017 to 2020, various organisations, including Gateway to Elation, the Zimbabwe Library Association Midlands Branch, and the Zimbabwe University Library Consortium (ZULC), have discussed this issue on diverse platforms. This issue comes against the backdrop of the need to ensure adequate resources for any user group within libraries (IFLA 2016). The United Nations Convention on the Rights of Persons with Disabilities (UNCRPD) (UN 2006) (especially articles 9, 21, and 24) states that individuals with visual impairment have the right to equal access to books, knowledge, and information at the same time, cost, and quality as everyone else. In addition, the Zimbabwe Council of Higher Education (ZIMCHE), as the watchdog of academic institutions in Zimbabwe, also pays attention to the need to have in place adequate resources for any user group within academic institutions, including their libraries. Therefore, the libraries run the risk of having their accreditation expunged as they are in direct contrast to international and national standards of resource provision. Even with this problem, there is a lack of empirical research and evidence that has been conducted within the context of Zimbabwe. This motivated the study to be conducted to bridge this gap in literature and practice.

Purpose of the Study

Considering the above-mentioned problem, the premise of this study was to assess strategies that could be used by academic libraries in the Midlands Province of Zimbabwe to enhance the provision of assistive resources for visually impaired patrons. To realise this purpose, the following research questions guided this study:

1. What are the assistive resource needs of the visually impaired library patrons in academic libraries within the Midlands Province, Zimbabwe?

2. What factors militate against the provision of assistive resources for patrons with visual impairment in academic libraries within the Midlands Province, Zimbabwe?

3. How can the academic libraries enhance the provision of assistive resources for patrons with visual impairment within the Midlands Province, Zimbabwe?

Review of Related Literature

Academic libraries are established to serve the informational, learning, educational, and other library needs of patrons in a university or college. Such patrons include those with learning or intellectual impairments and those who are hard of hearing, visually impaired, and gifted. The institution of assistive resources within academic libraries in the 20th century positively affected academic library patrons, as such resources enabled library access to patrons living with impairments (Ayiah 2017). Such resources reduced disgruntlement from patrons with visual impairment, while at the same time expanding the libraries' resource base (Ekwelem 2013). Babalola and Haliso (2011) elucidated that assistive resources were anticipated to easily gain traction amongst academic libraries as they addressed the library needs of patrons with visual impairment. However, contrary to expectations, such developments have not extended to Africa, as the library needs of patrons with visual impairment remain unattended and unaddressed (Chimhenga 2017). Researchers such as Babalola and Haliso (2011) and Ncube (2015) blame the libraries for being unable to take a more proactive role in establishing the assistive resources needed by patrons with visual impairment.

On the 27th of June 2013, the World Intellectual Property Organization (WIPO) adopted the Marrakesh Treaty in Morocco. This treaty has had a positive effect in developed countries (Bonnet 2017), owing to its exceptions to copyright and other related rights in order to cater to the needs of individuals with visual impairment for assistive resources. Mugo (2013) avers that despite this treaty, most published works in academic libraries remain inaccessible to the visually impaired in Africa. The issue is perturbing as it raises questions about the quality of services, technology, and commitment of the libraries to ensuring inclusive and fair tendencies (Babalola and Haliso 2011; Ncube 2015).

"Assistive resource" is a broad term, which encompasses assistive technology and assistive services. Mugo (2013) notes that assistive technology can be seen as an interdisciplinary field of knowledge that encompasses equipment, products and practices established to inspire the functionality of individuals living with a disability. Mugo (2013) also states that assistive services entail any support and facility that directly helps an individual living with a disability in selecting, acquiring, or using assistive technology. Hence, in this study, assistive resources include technologies and services that are designed to aid individuals living with a disability in making use of the library. There are several groupings of visually impaired individuals. The *International Classification of Diseases 11* (cited in WHO 2021) identified the following three categories of visual impairment:

1. Blindness: The lack of light perception is known as total blindness or total visual impairment.

2. Moderate visual impairment: This refers to someone who can tell the shapes and colours of objects and can distinguish between brightness and darkness.

3. Severe visual impairment: This refers to those who can only distinguish more obvious changes in brightness and darkness.

There are several assistive resources needed by visually impaired patrons. Machado and Vieira (2017) noted that patrons with visual impairment need screen readers. Such assistive resources translate text in digital format into speech. The two commonly used screen readers are NonVisual Desktop Access (NVDA) and Job Access With Speech (JAWS). Eskay and Chima (2013) proclaim that the need for Braille in academic libraries cannot be overestimated. The Braille Authority of North America (2002) expounds that Braille is a form of written language that is meant for the blind in which characters are characterised by patterns of raised dots that can be felt with fingertips. Demson and Timony (2010) emphasise the need for libraries to ensure a welcoming and safe environment that encourages patrons with visual impairment to read and take on life-long learning activities. Though there are several assistive resources needed by patrons with visual impairment, there is limited information relating to such needs. In terms of factors militating against the provision of assistive resources for patrons with visual impairment in academic libraries, the study of Rayini (2017) points to a lack of awareness by library staff on suitable assistive resources that can meet the needs of patrons with visual impairment. Apart from such awareness, other factors include a lack of information and communications technology (ICT) infrastructure and insufficient financial resources in libraries. In addition, issues such as an inadequate staff complement and antagonistic attitudes by staff towards assistive resources militate against the provision of assistive resources for patrons with visual impairment in libraries (Babalola and Haliso 2011; Ncube 2015; Rayini 2017). To enhance the provision of assistive resources, Assistive Technology for Education (n.d.) suggests a frequent assessment of assistive resources needed by patrons with visual impairment. Without such an assessment, patrons would likely be provided with resources that do not meet their needs. Bruinsma (2011) asserts that proper planning would ensure suitable resources are acquired either through open source or proprietary software. Ncube (2015) emphasises that the need to train and develop library staff members and patrons in academic libraries cannot be overemphasised.

Scope of Study and Methodology

The study was conducted in academic libraries in the Midlands Province of Zimbabwe. Five academic libraries in the province met the conceptual definition of academic libraries. These encompassed two university-based academic libraries, the Midlands State University Library and the Zimbabwe Open University Midlands Regional Campus Library, and three college-based academic libraries, which included Gweru Polytechnic Library, Kwekwe Polytechnic Library and Mkoba Teachers' College Library. The study adopted a qualitative research methodology, using a case study method. This entailed undertaking an in-depth investigation of assistive resources provision (the case) within academic libraries in the Midlands Province, Zimbabwe (context). The study used the saturation point as the base for the sample size (see Table

1 below). A homogenous sampling technique was used to select the academic libraries and library patrons with visual impairment. The library patrons with visual impairment had distinct categories that included students, staff members and alumni. Expert sampling was used to select library staff members, staff members from the student service responsible for students with disabilities, lecturers that teach patrons with visual impairment, and Zimbabwe Library Association members.

The study made use of questerviews to generate data from the selected library staff members. Interviews were used to solicit information from the staff members from the student services, lecturers, and patrons with visual impairment. A single focus group discussion was used to generate data from the Zimbabwe Library Association (ZimLA) executive members. The study also analysed several relevant documents. In addition, direct observations were used to generate data. In analysing the data, the study used the Computer-Assisted Qualitative Data Analysis (CAQDAS) technique, through the Qualitative Data Analysis (QDA) Miner Elite software. The QDA Miner Lite software assisted the study in reporting the qualitative data through the Report Manager that offered presentation-quality visuals (particularly tables), case categorisation and coding of themes. Khosa (2015) asserts that to ensure clarity of qualitative data presentation, some qualitative researchers make use of tables. Therefore, tables, themes, words, and verbatim quotations were used to present the data.

Research Findings and Discussions

To present the findings, the study used themes. The first theme focused on describing the study participants. The other themes were derived from the research questions.

Description of the Study Population

The study was conducted within five academic libraries. The QDA Miner Lite software provided codes for each of these libraries. Concerning the study participants, the QDA Miner Lite software classified them as cases. Table 1 shows this description.

Table 1: Description of participants (*N*=59)

Library Codes	Case Category	Case Code Category	Number of Cases	Instrument Used
AL1 – AL5	Library staff members	LS1 – LS12	12	Questerviews
	Student services staff members	SS1 – SS4	4	Interviews
	Lecturers	DSL1 – DSL5	5	Interviews
	Library patrons: students	VIP1 – VIP16	16	Interviews
	Library patrons: staff members	SMP1 – SMP10	10	Interviews
	Library patrons: alumni	AP1 – AP6	6	Interviews
ZM	ZimLA members	ZFGD1 – ZFG6	6	Focus group discussion
Total number of cases			**59**	

Table 1 shows that each academic library was assigned a code, that is, AL1 to AL5, to classify them, while ZM was used for ZimLA. The table also indicates that the study participants were categorised into cases. Using the case category, each study participant was assigned a case code. The total number of study participants (cases) was 59. Mason (2010) stipulates that in qualitative studies the sample size is signified by a saturation point for the social process under investigation. In this study, 59 participants were the saturation point.

Assistive Resource Needs of the Patrons with Visual Impairment in Academic Libraries

As assistive resource needs differ with context, environment, and culture, finding out what assistive resources were needed by patrons with visual impairment was essential in providing contextualised and culturally appropriate strategies for addressing the research problem and the first research question. Table 2 displays a summary report from the QDA Miner Lite software of the study participants.

Table 2: Visually impaired patrons' assistive resource needs (*N*=59)

Libraries Case Category*	Code	Count	% Codes	Cases	% Cases	Nb Words	% Words
A1, A2, A3, A5	Braille	29	3.10%	26	44.10	539	1.10%
A1, A2, A3, A5	Screen readers	25	2.70%	25	42.40	623	1.30%
A1, A3, A5	Microsoft Ease of Access	24	2.60%	19	32.20	649	1.30%
A1, A2, A3, A5	Book readers	20	2.20%	20	33.90	371	0.70%
A1, A2, A3, A5	Screen magnifiers	20	2.20%	20	33.90	325	0.70%
A2, A3, A5	Large print	18	1.90%	16	27.10	373	0.80%
A1, A2, A3, A4, A5	Restrooms	17	1.80%	17	28.80	528	1.10%
A3, A5	Reference and information services	16	1.70%	16	27.10	435	0.90%
A1, A2, A3, A5	Trained library staff members	13	1.40%	13	22.00	361	0.70%
A1, A2, A3, A5	Audio output devices	12	1.30%	12	20.30	154	0.30%
A1, A3	Books in audio format	11	1.20%	11	18.60	118	0.20%
A1, A2, A3, A5	Embossers	11	1.20%	10	16.90	123	0.20%
A1, A2, A3, A5	Talking calculators	10	1.10%	10	16.90	108	0.20%
A1, A2, A3, A4, A5	Internet of Things (IoT)	9	1.00%	9	15.30	431	0.90%
A1, A2, A3, A5	Voice recognition tools	9	1.00%	9	15.30	119	0.20%
A1, A3, A5	Carrel desk	8	0.90%	8	13.60	129	0.30%
A1, A2, A3, A5	Separate room	7	0.80%	7	11.90	125	0.20%

***NB:** The libraries case category column denotes the libraries where the assistive resource need was identified in the subsequent column titled code.

The most mentioned assistive resource need was materials in Braille. In explaining this, a lecturer noted that "the need for Braille in academia cannot be overstated due to its uniqueness in ensuring that any individual, with or without visual impairment, can gain access to information through the use of the code language" (CASE: DSL2). What

emerged from the study is that Braille is imperative as it ensures that patrons with visual impairment can read, make use of the computers, and subsequently access information. In agreement with these findings, Guder (2012) asserts that Braille should be viewed as a form of code language for people with visual impairment, such that any visually impaired individual is bound to use it.

The study revealed that embossers were also needed by the visually impaired patrons. In an interview, a staff member from the student services explained the need for embossers as follows:

> This is important for students as most lecturers provide learning materials in text format, hence [they] need to be transcribed into a format that students with visual impairment can access. There is also a need for text magnifiers. These are very crucial for students that are not blind but visually impaired, as they enable text enlargement and ensure accessibility of information for such types of students. (CASE: SS2).

In line with these findings, Eskay and Chima (2013) noted that the blind need Braille writing equipment, such as embossers, as they print tangible Braille characters.

A perception that was shared by various participants was the need for screen readers. Two library staff members noted that "there are so many assistive resource needs, of which screen readers is one of them" (CASE: LS7) and "patrons with visual impairment need computers with screen readers. For example, they may need computers with NVDA and JAWS software for computer content reading" (CASE: LS7). This reveals that screen readers play a crucial role in enabling visually impaired library patrons to use computers and gain access to content on a computer screen through voice output. The study further found that some screen readers were needed owing to their ability to connect to the internet. In explaining this, a staff member from student services noted the following:

> There are diverse types of readers, for instance, one essential reader is the Vita reader, which can connect to the internet using Wi-Fi, store documents and stream multimedia content. Such readers read the text and provide means of taking pictures of documents. ... In addition, there is JAWS and NVDA. (CASE: SS2)

Machado and Vieira (2017) elucidate that screen readers provide support to people with visual impairments in using information technology devices independently and with confidence.

Of interest in Table 2 is the need for the Internet of Things (IoT). This finding is interesting as the application of the IoT is a new concept in the domain of libraries. Table 2 demonstrates that the study participants had much to say about IoT, as noted in the number of words section (431). The following was noted by a lecturer:

> The current trends show that the Internet of Things has taken a root, and I suppose in the libraries also. Such entails having in place electronic devices and systems that are connected to the internet, and able to provide customised and personalised information that is specific to an individual query. … There is an application, referred to as Siri, which makes use of speech requests, and provides a user interface to respond to such requests. The application can adapt and expect the needs of the user or users in each period. The libraries should be in a position of acquiring such an application for the visually impaired, so that could be linked to what is happening in the library. Microsoft has also implemented a similar software, called Cortana, a digital assistant, able to search the computer and internet for individuals. (CASE: DSL1)

A ZimLA member edified this view by pointing out that the IoT is an innovation that should not go unnoticed in the library realm, as it can provoke relevance in library services that was slowly slipping away due to the proliferation of information. Koh (2019) notes that though this technology is still expensive, libraries that have experimented with it have attested to its importance and necessity in making the library experience for the visually impaired worthwhile.

Restrooms specifically designed for the needs of the visually impaired were found to be one of the assistive facilities needed by the library patrons. One of the library patrons, complaining about a lack of such facilities, noted the following: "There are no restrooms for people with disabilities. We use the same restrooms as other individuals within the institute. Such restrooms have not been modified to accommodate people with disabilities, hence they provide a challenge" (CASE: VIP1). The study also found that international and national benchmarks prioritise the need for customised restrooms. One of the library patrons noted the following:

> Though they may be considered unimportant in terms of information access, restrooms are essential in ensuring that patrons are comfortable in using the library. As such, the library should have restrooms designed for people with disabilities. Public and private organisations have upheld this view; hence the libraries should also follow suit. (CASE: AP5)

Concerning these findings, a study by Tungaraza (2010) found that patrons with visual impairment did not use the libraries due to a lack of custom-designed restrooms to meet their needs.

As shown in Table 2, carrel desks were needed by the visually impaired patrons. One of the library staff members (CASE: LS11) noted that since carrel desks can separate patrons from the surroundings partly or completely, they are needed by patrons with visual impairment to ensure that they are free from disturbance in the library. Another participant, who is a library patron, said the following:

> I think the library should have a reading space that enables someone with visual impairment to read without any interruption from peers. Such would facilitate easiness, comfort and independence of patrons when they visit and use the library. (CASE: SMP1)

The key aspect that emerged from the study findings was that carrel desks are a valuable resource for patrons with visual impairment in enriching their attentiveness in the library. The study of Munyoro and Musemburi (2019) also substantiates the findings of this study, as it found that patrons with visual impairment preferred to sit at carrel desks rather than open ones.

Factors Militating Against the Provision of Assistive Resources for Patrons with Visual Impairment

This section was vital in the study as the factors underscored the problem under study. In addition, this section provided a foundational basis for addressing the third research question and the purpose of the study. Table 3 displays a summary report from the QDA Miner Lite software of the synthesised and analysed data from the study participants.

Table 3: Factors militating against the provision of adequate assistive resources (*N*=59)

Libraries Case Category*	Code	Count	% Codes	Cases	% Cases	Nb Words	% Words
A1, A2, A3, A5	Inadequate equipment and infrastructure	28	3.00%	21	35.60%	866	1.70%
A1, A2, A3, A4, A5	Lack of budget and financial resources	25	2.70%	20	33.90%	558	1.10%
A1, A2, A3, A5	Inadequate training and development	21	2.30%	20	33.90%	529	1.10%
A1, A2, A3, A4, A5	Lack of strategies, policies, and procedures	18	1.90%	13	22.00%	325	0.70%
A1, A2, A3, A4, A5	Lack of motivation	13	1.40%	12	20.30%	254	0.50%
A2, A3, A5	Attitude of library staff members	8	0.90%	8	13.60%	349	0.70%

A1, A3, A5	Lack of well-established communica-tion channels	6	0.60%	5	8.50%	229	0.50%
A1, A2, A3, A5	Lack of management support	6	0.60%	5	8.50%	211	0.40%
A1, A2, A3, A5	Lack of knowledge about patrons' needs	4	0.40%	4	6.80%	279	0.60%
A1, A2, A3, A4, A5	Lack of national legislation	4	0.40%	4	6.80%	157	0.30%
A1, A2, A3, A4, A5	Confusion on the selection of assistive resources	4	0.40%	4	6.80%	122	0.20%
A2, A3, A5	Lack of perceived need for assistive resources	3	0.30%	3	5.1%	101	0.20%
A1, A2, A3, A4, A5	Inadequate culture to foster services for visually impaired patrons	2	0.20%	2	3.40%	84	0.20%
A1, A2, A3, A4, A5	Failure to market assistive resources to visually impaired patrons	1	0.10%	1	1.70%	16	0.00%

Source: Field data (2019)

*__NB:__ The Libraries Case Category column indicates the libraries that were affected by the militating factor under the code column.

Table 3 demonstrates that inadequate equipment and infrastructure was the most significant factor militating against the provision of assistive resources. The factor was extensively discussed by the study participants, as indicated by the total number of words in Table 3 (866). In explaining the major reason behind this, one of the staff members from the student services noted the following:

> The major challenge we are experiencing within higher education in Zimbabwe is the massification of students, without corresponding resources. Institutes of higher education are enrolling quite a number of students without increasing their resources and services. This entails that financial resources that could have been allocated to the acquisition of resources for the visually impaired have to be allocated to other operations that would ensure that the institutions stay afloat, for instance, electricity, Wi-Fi, students' accommodation and at times rentals. (CASE: SS4)

Based on these findings, it is clear that the massification of students has affected the libraries as a considerable number of students find it difficult to access materials to address their academic work owing to insufficient materials in the libraries. Tanawade (2011) also notes that the massification of students has affected the adequacy of equipment and infrastructure in academic institutions.

As shown in Table 3, there is a general lack of training and development in using assistive technologies amongst library staff members. The researcher also observed that some of the library staff members were unable to demonstrate or make use of technologies at their disposal. In line with these findings, Sanaman and Kumar (2014) observe that due to a lack of training, some library staff are unaware of accessibility issues. In addition, Table 3 shows that confusion amongst the staff members regarding the selection of assistive resources was a factor that affected all libraries under study. One of the study participants provided the following insight: "Our collection development policy is not clear on the selection criteria and procedure about technologies for users with visual impairment. Hence, at the end of the day, it may become a challenge to choose the right technology" (CASE: LS12). Coincidentally, the study findings revealed that library staff members were the only ones that mentioned this factor. The researcher, through document analysis, found that the library staff members were involved in the selection process of library resources. Hence, they were the ones with knowledge of the difficulties faced in this process. Langat and Kiprono (2014) assert that due to the sophistication and complexity of some assistive resources, library staff members are challenged in selecting the most proper resources to suit their patrons.

As shown in Table 3, three of the study libraries were found to be affected by the attitude of some library staff members. One of the library staff members explained it the following way: "It should be noted that some staff members are demotivated, and they exhibit negative attitudes towards implementing diversity within the library" (CASE: LS6). The researcher, through analysing complaints reports from one of the libraries, found that complaints had been raised by some patrons regarding the attitude of the library staff members. What stems from these findings is that library staff members' negative attitudes towards patrons with visual impairment are a barrier to the provisioning of assistive resources. In line with these findings, Munyoro and Musemburi (2019) point out that library staff members' negative attitude towards patrons with disabilities is one of the barriers to the provision of assistive resources and the subsequent inclusion of such patrons.

Table 3 shows that a lack of financial resources for providing assistive resources was another militating factor. In explaining this lack, a staff member from student services noted that "there is a lack of financial resources for libraries to cope with the technological advancements at a global level. Staff members are also demotivated due to low salaries" (CASE: SS2). IFLA (2014) contends that the lack of financial resources, especially in African and other acutely poor nations, has affected the acquisition of adequate accessibility equipment and infrastructure. The other aspect that emerges from the above sentiments is that the economic challenges in the nation have cascaded to academic institutions, thus discouraging the provision of assistive resources.

Strategies for Enhancing the Provision of Assistive Resources

This section was imperative in answering the third research question, addressing the research problem, and realising the purpose of the study. Table 4 displays a summary report from the QDA Miner Lite software of the synthesised and analysed data from the study participants.

Table 4: Strategies for enhancing the provisioning of assistive resources

Libraries Case Category*	Code	Count	% Codes	Cases	% Cases	Nb Words	% Words
A1, A2, A3, A4, A5	Assistive resources needs analysis	43	4.60%	35	59.30 %	1318	2.70%
A1, A2, A3, A4, A5	Establish networks and cooperation amongst stakeholders	35	3.80%	25	42.40 %	1165	2.40%
A1, A2, A3, A5	Customisation of the library buildings and layouts	34	3.70%	32	54.20 %	1220	2.50%
A1, A2, A3, A4, A5	Training and developing library staff members	31	3.30%	27	45.80 %	740	1.50%
A1, A2, A3, A4, A5	Budget for and acquire adequate technical and infrastructural facilities	30	3.20%	20	33.90 %	670	1.40%
A1, A2, A3, A5	Establish a separate library	24	2.60%	19	32.20 %	1227	2.50%
A1, A2, A3, A4, A5	Change of culture	19	2.00%	18	30.50 %	918	1.90%

A1, A2, A3, A4, A5	Current awareness services and selective dissemination of information	15	1.60%	14	23.70 %	472	1.00%
A1, A2, A3, A4, A5	Crafting of policies, procedures and regulations	10	1.10%	10	16.90 %	353	0.70%
A1, A2, A3, A4, A5	Internal marketing	9	1.00%	8	13.60 %	318	0.60%
A1, A2, A3, A5	Engage new staff members	9	1.00%	8	13.60 %	241	0.50%
A1, A2, A3, A4, A5	Source for donations	7	0.80%	7	11.90 %	182	0.40%
A1, A2, A3, A4, A5	Planning for assistive resources provisioning	6	0.60%	6	10.20 %	207	0.40%
A1, A2, A3, A4, A5	Continuous improvement	6	0.60%	6	10.20 %	147	0.30%
A1, A2, A3, A4, A5	Motivating library staff members	5	0.50%	5	8.50 %	196	0.40%
A1, A2, A3, A4, A5	Fundraising initiatives	5	0.50%	5	8.50 %	191	0.40%
A1, A2, A3, A4, A5	Supervision of staff members	5	0.50%	5	8.50 %	177	0.40%
A1, A2, A3, A4, A5	Restructuring of library and information science training	4	0.40%	4	6.80 %	190	0.40%
A1, A2, A3, A4, A5	Use of open-source assistive resources	4	0.40%	4	6.80 %	123	0.20%
A1, A2, A3, A4, A5	Top management support	4	0.40%	4	6.80 %	74	0.10%
A1, A2, A3, A4, A5	Establishment of national legislation on assistive resources provisioning in academic libraries	3	0.30%	3	5.10 %	140	0.30%

*__NB:__ The libraries case category column shows the libraries that needed the strategies for enhancing the provision of assistive resources in the code column.

A perception that was widely shared by most of the study participants was that the libraries must undertake assistive resources needs analysis to enhance the provisioning of adequate assistive resources for visually impaired patrons. One of the staff members from student services had the following to say:

> Assistive resources must be planned and budgeted for. ... The planning would require undertaking a needs analysis to ensure that the resources that are acquired meet the needs of the students. (CASE: SS2)

Studies of Bailey et. al. (2000), Lembinen (2018) and Grataridarga (2018) all agree that a needs analysis of assistive resources is imperative in ensuring that the academic libraries are abreast of the assistive resource needs of the visually impaired patrons.

The study findings revealed that the customisation of the libraries' buildings and layouts could provide an advantage to patrons with visual impairment in accessing the libraries. One of the library staff members noted that "the exterior of the building facility has been customised to cater for most disabilities; however, the interior building facility needs to be further renovated to accommodate the visually impaired patrons" (CASE: LS6). This view was also supported by library patrons, through the following insights:

> The library should be structured in such a way that people with disabilities, including those with visual impairments, can easily enter and use the library without difficulties. This was not the case in the library, as there was a lack of ramps in entry points, with library desks and chairs not spaced properly. Several computer and internet cables made it difficult for one to easily move around. (CASE: AP4)

Based on these perceptions, the arrangement of the libraries was considered vital in enhancing the provision of adequate assistive resources to visually impaired patrons. The researcher also observed the need for the arrangement of cables in some libraries, as some of the libraries had unsecured ethernet, power and coaxial cables, such that patrons with visual impairment could easily trip and fall as a result of the cables. Concerning desks and chairs, one of the library staff members suggested that study carrels be acquired for the visually impaired patrons to ensure that they are comfortable in using the library. In line with these findings, the study of Munyoro and Musemburi (2019) noted the importance of a customised separate library, a resource centre, in enhancing the provision of assistive resources to visually impaired patrons.

The study's findings revealed that training and developing library staff members was another strategy of enhancing the provision of assistive resources for patrons with visual impairment in all the academic libraries. One of the library staff members noted that "library staff need to be trained on how to cater for the visually impaired patrons" (CASE: LS6), while another indicated that "Braille short courses and training in using assistive devices should be on the cards" (CASE: LS8). The study findings reveal the need for library staff training in serving patrons with visual impairment. Findings from the study also revealed that the library and information science curricula at colleges and universities should include components of disability studies or special needs education to enhance the effectiveness of staff members.

Table 4 shows that there was a need for all libraries to budget for and acquire adequate technical and infrastructural facilities. One of the library staff members acknowledged that they had never considered the resources that pertain to patrons with visual impairment in crafting their budget, while another library staff member noted in agreement that "since we have never included such patrons in our budget, I think we have to change that moving on. … I am sure our budget bids in future will include all

necessary equipment and devices that ensure accessibility to the visually impaired" (CASE: LS1). The study of Rohwerder (2018) underlines the importance of library staff training in equipping them with skills and competencies in assistive services that need to be provided to patrons who are visually impaired.

The study also found that academic libraries may undertake varied fundraising initiatives, including sourcing for donations and crowdfunding. One of the ZimLA members noted the following: "Crowdfunding and getting a buy-in from government departments to invest in this area is another choice that the libraries can assume" (CASE: ZFGD6). Apart from sourcing for donations and fundraising projects, the study also found that the libraries can acquire assistive resources through open-source software resources. The following sentiments were aired by one of the study participants:

> To expand the scope of its resources, the library can also download and install free assistive software found online. Such software is also effective in enhancing access to information. (CASE: SMP10)

Guder (2012) posits that there are numerous free and fee-based screencast products, some of which libraries can take advantage of for free.

Conclusions and the Way Forward

It can be concluded that patrons with visual impairment within academic libraries in the Midlands Province of Zimbabwe need various assistive resources to cater for their library and informational needs. Of particular note is the need for the Internet of Things, which was revealed as one of the aspects that can transform the libraries and enable them to be effective in providing services to the visually impaired. Though there are various assistive resources needed by such patrons, the lack of a library user needs assessment, inadequate equipment and infrastructure, a lack of budget and financial resources, the attitude of library staff members, a lack of national legislation, and other militating factors affected the provision of such resources by the libraries. It is, therefore, essential for each library to conduct a needs analysis of assistive resources to establish the precise resources that are required by the visually impaired patrons. Such an analysis will inform decision-making and planning in accordance with such patrons.

The libraries' management should undertake diverse training and development initiatives to capacitate the library staff members in service provision to the patrons with disabilities, including those with visual impairment. Such training and development would change the culture and attitude of the staff members in their conduct in the libraries. The libraries, through the academic institutions' management, should also engage in public-private partnerships (PPP) with different organisations at the provincial, national, or international level, to establish Disability Resource Centres. Owing to the customisation of such centres, they can be effective in the provision of assistive resources to visually impaired patrons. It may be vital for library practitioners within the province and at the national level to advocate for the establishment of

legislation that details service provision to individuals with visual impairment in academic institutions. The Zimbabwe Library Association could play a pivotal role in the enactment of such legislation.

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