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ASSISTIVE TECHNOLOGIES AND INFORMATION ACCESS BY LIBRARY USERS WITH VISUAL IMPAIRMENT IN ACADEMIC LIBRARIES IN JIGAWA STATE

Nura Abdullahi
Sule Lamido University Kafin Hausa
nuraabdullahislu@gmail.com
+2348060524644

Edmond Amos Wahuyini
Adamawa State College of Education Hong
Edmondamos8453@gmail.com
+2348031878453

Ismaila Hassan
Sule Lamido University Kafin Hausa
Ismaila8703@gmail.com
+2347033040125

Abstract
The researcher examined assistive technologies and information access by library users with visual impairment in academic libraries in Jigawa State, Nigeria. Descriptive survey research design was adopted. The population of the study comprised 148 librarians and library users with visual impairment. A sample of 43 respondents were used through purposive sampling technique. Two research questions were generated and two null hypotheses formulated and tested. Questionnaire ***was*** *used as instruments for data collection. The instrument was validated by three experts; two in Library and Information Science, one in Science and Mathematics Education, Rev. Fr. Moses Orshio Adasu University, Makurdi. The reliability of the instrument was ascertained through a trial-test on librarians in Federal University of Technology Babura and Hussaini Adamu Polytechnic Kazaure. The test yielded Cronbach Alpha of 0.89. Data were analyzed using Mean and standard deviation to answer research questions while Chi-square goodness of it fit will be used to test the hypothesis at 0.5 level of significance. Findings of the study revealed that: there is no significant influence of accessibility to assistive technologies on information access by library users with visual impairment in academic libraries in Jigawa State and there is a significant influence of assistive technologies on information access by library users with visual impairment in academic libraries. It was therefore recommended that academic libraries in Jigawa State should enhance the availability and usability of assistive technologies by providing modern, functional, and user-friendly devices suited to the needs of visually impaired users. And academic institutions should implement inclusive policies and regular training programs to ensure effective use of assistive technologies by both library staff and visually impaired users.*
Keywords: Assistive technologies, Information access, Visual impairment, Academic libraries

Introduction

Information is fundamental to human development and serves as a vital resource for effective decision-making globally. Just like capital and labor, investment in information enhances

productivity and fosters societal growth. According to Okiki (2017), information remains the cornerstone of any society's survival and progress. In today's world, information can be accessed through various tools and platforms enabled by information and communication technologies (ICTs). The advent of ICT has revolutionized all aspects of human activity, particularly education, by improving teaching, learning, and the dissemination of knowledge within academic communities. This technological advancement has shifted the concept of information from limited, localized access to a more inclusive, global reach. Consequently, it has empowered librarians to manage diverse information sources and ensure equitable service delivery to all users; regardless of gender, background, or physical ability, thereby promoting universal access to information.

Access to information for all is a fundamental principle in library and information science. Academic libraries in tertiary institutions are obligated to provide equitable information services to every user, regardless of ability or disability. The laws of library science emphasize inclusivity and user-centered service delivery. According to Ayiah (2017), Ranganathan's five laws; books are for use, every reader his book, every book its reader, save the time of the reader, and a library is a growing organism, collectively underscore the importance of meeting the diverse information needs of all users efficiently and without bias. In light of this, it becomes evident that libraries must ensure that every individual, including those with visual impairment, enjoys equal access to information.

The concept of equal access to information promotes the inclusion of all regardless of individuals' physical or mental competencies. As Khetarpal (2014) notes, it is imperative for visual impaired library users to be able to access ICT resources in meeting the information of their needs. According to Pradhan and Samanta (2018), library users with visual impairment comprise individuals who are blind or have visual dysfunction such as refractive errors, colour blindness, partial sight and low vision. Often, these individuals lack access to textbooks, as only five percent of published books are accessible in formats suitable to them; hence they are usually beholden to volunteer readers when their resources are not converted into Braille (Witte, Steel, Gupta, et al., 2018). As stated in the Libraries Serving Persons with Print Disabilities section of the International Federation of Library Associations and Institutions (IFLA), all libraries must give people living with disability a sense of belonging through the provision of inclusive libraries and information services (Irvall & Nielsen, 2015). Given that over 48 million people in sub-Saharan Africa, with 2.5 million being Nigerians, are living with a visual disability, this situation has grave implications for the continent.

Assistive Technologies (ATs) are devices or tools designed to facilitate access to information and enhance the functional capabilities of people with disabilities. According to UNESCO (2021), ATs are intended to maintain or improve an individual's functioning and independence, enabling participation and promoting overall well-being. They include assistive, adaptive, and rehabilitative devices that support communication, education, work, and recreation, allowing individuals with special needs to perform tasks they would otherwise find difficult or impossible. By improving mobility, vision, hearing, and communication, ATs provide greater independence and improve the quality of life for users, including access to education, information, healthcare, and employment opportunities. In library contexts, the availability of tools such as screen magnifiers, Braille embossers, screen readers, text-to-speech synthesizers, and speech recognition software can significantly enhance information access for users with visual, hearing, or

physical impairments (Odigie, 2021). Consequently, the effectiveness of these technologies is closely linked to the level of accessibility of assistive technologies in academic libraries.

Level of accessibility of assistive technologies for visually impaired users in academic libraries has to do the degree to which visually impaired users are consulting information resources for the purpose of satisfying their information needs. The real challenge in this information age is not only provision of information resources or storing information, but getting people to use information appropriately. Meanwhile, Onifade and Sowole (2019) rightly noted that, for libraries to add to the advancement of knowledge, they must not only provide resources but also ensure that the resources available are effectively accessible to users. Academic Libraries are libraries attached to higher institutions of learning such as universities, colleges, polytechnics among others. They support mission, curriculum, teaching and research of the institutions they attached to (American Library Association, 2021). Academic Libraries in tertiary institutions in Jigawa State are expected to provide enabling environment for access to information resources by users with special needs. To achieve this, assistive technologies need to be provided and managed according to special needs specifications. In this regard, academic libraries should identify all the necessary facilities that can assist users with special needs in getting access to information of their need and the facilities also need to be modern and accessible in nature.

In spite of the need for inclusive provision of information in academic libraries for users with visual impairment, an examination on the studies conducted by Odigie (2021), Obim (2022), revealed that assistive technologies in academic libraries in Nigeria are not adequately provided. However, the studies revealed that users with visual impairment are not given the attention they deserve in terms of access to information in libraries. Majority of the academic libraries operate without assistive technologies and librarians lacks with special training to handle users with disabilities. It is against this background that the present study will find out on the assistive technologies and information access by visually impaired users in academic libraries in Jigawa State, and proffer some recommendations that may assist in overcoming the challenges associated with assistive technologies in academic libraries in the state.

Statement of the Problem

Visual impairment remains a major problem affecting access to information and educational opportunities for persons with disabilities. Although technological advancements have made information more accessible, individuals with visual impairment continue to experience limitations due to inadequate access to assistive technologies. In Nigeria, the number of students with visual impairment in universities has been on the rise, yet they still encounter several barriers such as stigmatization, lack of information resources in accessible formats, and weak institutional policies on inclusivity. It is likely that academic libraries, which should serve as equalizers in learning, have not effectively leveraged assistive technologies to support equitable access to information for these students.

In Jigawa State, users with visual impairment in academic libraries may still experience limited access to information despite the presence of some assistive technologies. The extent to which these technologies support their information needs remains uncertain, as many libraries appear to lack adequate or functional assistive tools such as screen readers, Braille devices, and audio materials. Similarly, the level of accessibility of these technologies for visually impaired

users seems questionable, as issues like inadequate funding, poor maintenance, and insufficient staff training may hinder effective utilization. Since there is an inconclusive debate regarding the extent of information access and accessibility of assistive technologies for visually impaired users in academic libraries in Jigawa State, the researcher deemed it necessary to investigate these issues empirically.

Objectives of the Study

The study investigated assistive technologies and information access by library users with visual impairment in academic libraries in Jigawa State. Specifically, the research sought to:

1. investigate the extent of information access by library users with visual impairment using assistive technologies
2. examine the level of accessibility of assistive technologies for visually impaired users in the libraries under study.

Hypotheses

The following hypotheses were formulated and tested:

1. Accessibility to assistive technologies has no significance influence on information access by library users with visual impairment in academic libraries in Jigawa State.
2. State of assistive technologies has no significance influence on information access by the library users with visual impairment.

Review of related Literature

Assistive technology (AT) refers to any item, equipment, software, product, or system designed to increase, maintain, or improve the functional capabilities of persons with disabilities. Majinge (2024) defines AT as any commercially acquired, modified, or customized device or system that enhances the functional abilities of individuals with disabilities. With the advent of the information age, libraries have become accessible to a broader range of users, including persons with visual impairments, who can benefit significantly from properly designed assistive technologies. Such technologies enable access to information in both print and digital formats, while alternative methods of computer input and output have empowered individuals with disabilities to engage with knowledge more effectively (Kuter, 2024). According to Watson (2020), ATs are assistive, adaptive, and rehabilitative devices that support communication, education, work, and recreation, promoting independence and improving overall quality of life. Therefore, assistive technologies play a crucial role in enhancing the ability of persons with disabilities to access and utilize information.

Information is fundamental to human wellbeing and serves as a major determinant of decision-making. Like other economic resources such as capital and labor, increased investment in information leads to enhanced productivity. Okiki (2017) emphasizes that information is the cornerstone on which the survival of any society depends. Today, information can be accessed through a variety of tools, and information and communication technology (ICT) has transformed all activities reliant on information, particularly in education. ICT has significantly improved teaching and learning in higher education and enhanced the flow of information within academic communities, shifting the concept of information from localized access to global availability. These

technological advancements have enabled librarians to manage diverse information sources conveniently and effectively for all users, irrespective of gender, color, ability, or disability, highlighting the importance of information access tools.

Information access tools are regarded as the means for obtaining information that exists in different forms and formats, while also providing easy accessibility to resources that users may not be aware of. Librarians organize information resources in libraries by creating various access points and tools to ensure effective utilization. The explosion of information sources in new formats and media necessitates the use of basic tools to facilitate access. To retrieve information, users rely on different tools, both in traditional library systems and in modern digital information environments, with an emphasis on using the most effective access mechanisms. Consequently, numerous search and information access tools have been designed and provided for use. Access tools serve as information location aids, helping identify what a library holds in its collection (Udofot & Nwachukwu, 2019). Ezekwe and Muokebe (2022) also affirm that these aids create awareness of the total collection and act as keys to the store of knowledge. Such tools, including catalogues, abstracts, bibliographies, indexes, finding lists, and registers, are essential for enhancing information retrieval in libraries, archives, and museums. Among these, the library catalogue is the most commonly used, providing a systematic list of collections and indicating the logical position of materials within the library, thus forming a foundation for the implementation of assistive technologies.

The implementation of assistive technologies in libraries has greatly improved access to information and resources for individuals with disabilities. Through the use of tools such as screen readers, braille displays, and text-to-speech software, visually impaired users can navigate digital and printed materials, personalize their reading experience, and engage in collaborative learning. Assistive technologies play an important role in equalizing opportunities for people with special needs in several aspects of life as these technologies enables them to overcome various limitations and obstacles faced in all types of environments (Alabi, 2020). Accessible technologies can have a remarkable effect on empowering persons with special needs accompanied with the internet that provides great opportunity for connections to a range of people regardless of their location (Baker, Hanson and Myhill, 2019). Access to information is a major problem for the disabled people but today assistive technologies helped in reducing the digital divide between able and disable peoples by providing information to their doorstep (Dodamani, 2019). There are numerous technologies available today for the individuals with disabilities to help them to access the printed or electronic material available in the libraries. Therefore, there is a need to provide them and train staff with skills for handling these technologies by creating possible ways to put them into use. The staff responsible for handling disability services should be well aware of the needs of students with disabilities and find solutions to keep pace with emerging technologies (Berkeley, Kressin and Oberlander, 2017).

Anhwere and Afful-Arthur (2018) carried out their study on accessibility and use of assistive technologies by visually impaired student in University of Cape Coast Library, Barfi. The purpose was to determine the accessibility, importance and problems encountered when using assistive technologies by visually impaired library users in the institution. Findings revealed that the assistive technologies available in the library are accessible. Also, majority of the visually impaired students' access information in the library using assistive technologies. Some of the major

problems respondents indicated using assistive technologies includes: inadequate computers, poor internet connectivity, power outages and insufficient search skills.

Mansa (2017) examined the role of academic libraries in information access by person with visual impairment in Southeast Nigeria universities. Five research questions were formulated to guide the study. The research design was expo-facto research design. The findings revealed that users with visual impairments found it difficult to access information in the libraries as a result of lack of skills from the librarians and inadequacy of assistive technologies in the selected libraries.

Samwel (2017) investigated the accessibility of library information resources to the users with Visual impairment in some selected public libraries in Tanzania. One of the objectives was to find out the challenges in accessing assistive technologies by visually impaired users. The study utilized qualitative methods through interview to collect data for investigating the scenario. Finding of the study established that lack of modern assistive technologies especially screen reader, text-to speech software, inadequate funding were the major challenges. Fund were not adequately allocated for developing library facilities, assistive technologies and collections in the accessible formats that lead to the delivery of inadequate services to users with visual impairment.

Research Methodology

The research design chosen for this study was a descriptive survey design. The population of the study consisted of one hundred and forty-eight (148) respondents, comprising 103 library staff and 45 visually impaired library users across twelve academic libraries in Jigawa State, namely.

The sample size for the study comprised 43 respondents 24 library staff and 19 visually impaired library users representing 29% of the total population. This was determined adequate in line with Emaikwu (2019), who posited that for a population below 1000, a sample size of 20% and above is sufficient. Purposive sampling technique was employed to select two librarians and two visually impaired users from each academic library, enabling the researcher to obtain rich and relevant data from participants knowledgeable about the phenomenon under investigation (Ashley, 2013). The study utilized two self-structured questionnaires titled "Assistive Technologies and Information Access in Academic Libraries by Users with Visual Impairment Questionnaire for Librarians (ATIAALUVIQL)" and "Assistive Technologies and Information Access in Academic Libraries by Users with Visual Impairment Questionnaire for Library Users (ATIAALUVIQ)" for data collection. The instruments were validated by three experts from Benue State University, Makurdi, and a trial test produced a Cronbach Alpha reliability coefficient of 0.87 for librarians and 0.89 for library users, indicating high internal consistency. Data were collected through face-to-face administration of the questionnaires with the help of two trained research assistants. The data were analyzed using frequencies, mean, and standard deviation to answer the research questions, with a midpoint mean of 2.50 on a four-point Likert scale serving as the benchmark for decision-making. Mean scores of 2.50 and above indicated positive responses, while mean scores below 2.50 indicated negative responses. Chi-square (χ^2) was used to test the hypotheses at the 0.05 level of significance; a p-value less than 0.05 led to the rejection of the null hypothesis, while a p-value equal to or greater than 0.05 led to its acceptance.

Results

Research Question 1: What is the extent of information access by library users with visual impairment using assistive technologies?

Table 2: Mean and Standard Deviation of the library users with visual impairment on getting access to information using the following assistive technologies in Jigawa State

S/No	Item Description (N=42)	VHL	HL	LL	VLL	$\bar{x}$	Std.D.	Decision
1	Brail books	-	6	9	27	1.50	0.74	LL
2	Brail keyboards	-	8	14	20	1.71	0.77	LL
3	Large-screen monitors	-	4	8	30	1.38	0.66	VLL
4	Talking books		4	20	18	1.67	0.65	LL
5	Text-to-speech software	-	3	12	27	1.43	0.63	LL
6	Talking browser	-	6	15	21	1.64	0.73	LL
7	Optical scanners	-	9	19	14	1.88	0.74	LL
8	Screen Access for All (SAFA)	-	6	17	19	1.69	0.72	LL
9	Reading Glasses	-	6	20	16	1.76	0.69	LL
10	Kuzwell 1000 software	-	11	15	16	1.88	0.80	LL
11	Kuzwell 3000 software	-	5	13	24	1.55	0.71	LL
12	Lovo. AI text –to- speech software	-	5	22	15	1.76	0.66	LL
13	Read Aloud text-to-speech software	-	5	21	16	1.74	0.67	LL
14	Braille Embosser	-	8	10	24	1.62	0.80	LL
15	Screen Magnifiers	-	5	19	18	1.69	0.68	LL
16	Large-screen monitor	-	5	17	20	1.64	0.69	LL
	Cluster		6	16	20	1.66	0.71	LL

KEY: LL=Low Level and VLL= Very Low Level.

Table 1 result shows that library users with visual impairments have very low access to assistive technologies, with mean scores ranging from 1.38 to 1.88 and most falling into the very low level (VLL). Notably, optical scanners and Kuzwell 1000 software have the highest means (1.88), yet still reflect minimal access. The cluster mean of 1.66 indicates that users' access to these technologies is predominantly very low, limiting their ability to effectively utilize available assistive tools. The Standard Deviations vary from 0.54 to 0.80, with most around 0.66–0.74, showing moderate variability in how library users perceive their access to assistive technologies. The higher SD for Kuzwell 1000 software (0.80) indicates slightly more diverse perceptions of

access to that particular tool.

Research Question 2: What is the level of accessibility of assistive technologies for visually impaired users in the libraries under study?

Table 2: Mean and Standard Deviation Scores of the level of accessibility of assistive technologies for visually impaired users in the libraries

S/No	Item Description (N=42)	VHL	HL	LL	VLL	$\bar{x}$	Std.D.	Decision
17	Brail books	-	4	9	29	1.40	0.67	VLL
18	Brail keyboards	-	6	14	22	1.62	0.73	LL
19	Large-screen monitors	-	4	6	32	1.33	0.65	VLL
20	Talking books		4	18	20	1.62	0.66	LL
21	Text-to-speech software	-	3	10	29	1.38	0.62	VLL
22	Talking browser	-	3	15	24	1.50	0.63	LL
23	Optical scanners	-	7	19	16	1.79	0.72	LL
24	Screen Access for All (SAFA)	-	4	17	21	1.60	0.67	LL
25	Reading Glasses	-	4	20	18	1.67	0.65	LL
26	Kuzwell 1000 software	-	9	15	18	1.79	0.78	LL
27	Kuzwell 3000 software	-	4	13	25	1.50	0.67	LL
28	Lovo. AI text –to- speech software	-	4	21	17	1.69	0.64	LL
29	Read Aloud text-to-speech software	-	4	20	18	1.67	0.65	LL
30	Braille Embosser	-	8	10	24	1.62	0.80	LL
31	Screen Magnifiers	-	5	17	20	1.64	0.69	LL
32	Large-screen monitor	-	5	16	21	1.62	0.70	LL
	Cluster		5	15	22	1.59	0.68	LL

The result in table 2 perceived level of accessibility of assistive technologies in the libraries is generally very low, with mean scores between 1.33 and 1.79. For example, large-screen monitors and Braille books are rated as very low in accessibility, indicating that these tools are not easily reachable or usable by visually impaired users. The aggregate mean of 1.59 underscores that accessibility remains a significant challenge, impeding effective use of assistive technologies. **Table 4 further shows** Standard Deviations are between 0.62 and 0.73, indicating moderate responses with some variation in perceptions of the accessibility of assistive technologies. The higher SD for optical scanners (0.72) indicates more varied opinions about their accessibility.

Hypothesis 1: Accessibility to assistive technologies has no significance influence on information access by library users with visual impairment in academic libraries in Jigawa State.

Table 3: Chi-square Analysis of Significance Influence of Accessibility to Assistive Technologies on Information Access by Library Users with Visual Impairment in Academic Libraries in Jigawa State

Responses	Fo	Fe	*P*	Df	x² Cal.	Remark
VLL	-	-				
HL	11	14.0	.607	2	1.000[a]	Accepted
LL	15	14.0				
VLL	16	14.0				
Total	**42**					

Based on the chi-square analysis presented in Table 3, the test yielded a chi-square value of $\chi^2 = 1.000$ with 2 degrees of freedom and a p-value of 0.607. Since the p-value (0.607) is considerably higher than the 0.05 level of significance ($\alpha = 0.05$), the null hypothesis is accepted. This means there is no significant influence of accessibility to assistive technologies on information access by library users with visual impairment in academic libraries in Jigawa State.

Hypothesis 2: State of assistive technologies has no significance influence on information access by the library users with visual impairment.

Table 4: Chi-square Analysis of Significance Influence of State of Assistive Technologies on Information Access by the Library Users with Visual Impairment

Responses	Fo	Fe	*P*	Df	x² Cal.	Remark
VLL	-	-				
HL	5	14.0	.011	2	9.000[a]	Sign.
LL	17	14.0				
VLL	20	14.0				
Total	**42**					

Based on the chi-square analysis presented in Table 4, the test yielded a chi-square value of $\chi^2 = 9.000$ with 2 degrees of freedom and a p-value of 0.011. Since the p-value (0.011) is less than the 0.05 level of significance ($\alpha = 0.05$), the null hypothesis is rejected. This implies that the state of assistive technologies has a significant influence on information access by library users with visual impairment. Therefore, the availability and condition of assistive technologies play a crucial role in determining how effectively visually impaired users can access information in the library.

Discussion of Findings

Finding showed that there is no significant influence of accessibility to assistive technologies on information access by library users with visual impairment in academic libraries in Jigawa State. The result could be like this because, although assistive technologies may be available in academic libraries in Jigawa State, several factors such as lack of user awareness, inadequate training on the use of the technologies, poor maintenance, or inappropriate selection of assistive tools may hinder their effective utilization. Consequently, mere accessibility does not automatically translate to improved information access for users with visual impairment unless these technologies are fully functional, appropriately matched to user needs, and supported by

user education and library staff assistance. The findings align with Oluwadamilola (2021) who found that while assistive technologies were present in some academic libraries in southwestern Nigeria; their mere availability did not enhance access to information for visually impaired users. The findings further align with Muhammad and Hassan (2022) who found that accessibility alone does not guarantee effective use of assistive technologies by visually impaired users in northern Nigerian university libraries.

Finding showed that there is a significant influence of assistive technologies on information access by library users with visual impairment in academic libraries. This outcome may be due to increased efforts by libraries to not only acquire assistive tools such as screen readers, Braille embossers, audio books, and magnifying software, but also to ensure that these tools are functional, user-friendly, and supported by well-trained staff. In such environments, library users with visual impairment are better positioned to independently access, interpret, and utilize information resources for academic purposes. The implication is that when assistive technologies are well-integrated into library services, and both users and staff are adequately equipped to utilize them, they significantly enhance information access for users with visual challenges. The findings are in agreement with Okon and Udo (2020) who found that the implementation of assistive technologies in university libraries in southern Nigeria significantly improved the information-seeking behavior of students with visual impairment. The findings further agree with Yahaya and Ibrahim (2021) who found that in selected public libraries in Kwara State, assistive technologies led to improved information access when librarians were trained to guide visually impaired users and when regular maintenance ensured the equipment remained in good working condition. However, the finding contradicts the position of Ibe and Chika (2019) who found no significant influence of assistive technologies on information access in academic libraries in the southeastern part of Nigeria. Their study indicated that although some libraries had procured assistive tools, many were outdated, improperly installed, or underutilized due to lack of awareness and poor staff training.

Conclusion

Based on the findings, it can be concluded that the presence of assistive technologies in academic libraries alone does not guarantee improved information access for users with visual impairment. Effective utilization depends on factors such as user awareness, staff competence, proper maintenance, and the suitability of the technologies to users' needs. However, when assistive technologies are well-integrated into library services, properly maintained, and supported by trained personnel, they significantly enhance information access and promote independent learning among visually impaired users.

Recommendations

1. Academic libraries in Jigawa State should enhance the availability and usability of assistive technologies by providing modern, functional, and user-friendly devices suited to the needs of visually impaired users.
2. Academic institutions should implement inclusive policies and regular training programs to ensure effective use of assistive technologies by both library staff and visually impaired users.

References

Alabi, A. O. (2020). Digital inclusion for visually impaired students through assistive technologies in academic libraries. *Library Hi Tech News, 37*, 14–17. https://api.semanticscholar.org/CorpusID:214430324

American Library Association. (2021). *Assistive technology: What you need to know library*. http://www.ala.org/resources/tipsheets/assistive-technologies

Anhwere, J., & Afful-Arthur, K. (2018). Accessibility and use of assistive technologies by visually impaired students in University of Cape Coast Library, Barfi. *The International Information and Library Review*, *33*(1), 97–111.

Ayiah, E. M. (2017). Provision of assistive technologies in academic libraries to student with visual impairment in Ghana: A case study of the University of Education, Winneba Ghana. http://www.digitalcommons.unl.edu/libphilprac/1679

Baker, D., Hanson, M., & Myhill, C. (2019). Access to library services and facilities by persons with disability: Insights from academic libraries in Ghana. *Journal of Librarianship and Information Science*, *22*(3), 147–151. https://doi.org/10.1177/0961000620917723

Berkeley, S., Kressin, F., & Oberlander, H. (2017). Disability and accessibility in the library and information science literature: A content analysis. *Library and Information Science Research*, *35*(2), 137–142.

Dodamani, A. M. (2019). Provision of assistive technology for students with visual impairment in university libraries in India. https://www.researchgate.net/publication/336611425

Emaikwu, S. (2019). *Research methods: Simple techniques*. Benin City: Goodnews Publications.

Ezekwe, F. A., & Muokebe, B. O. (2022). *Introductory studies in the use of library and information technology*. Enugu: RhyceKepex Publishers.

Irvall, B., & Nielsen, G. S. (2005). *Access to libraries for persons with disabilities: Checklist* (IFLA Professional Reports No. 89). International Federation of Library Associations and Institutions.

Khetarpal, O. I. (2014). Assistive technologies and information access in high institutions in Ogun State, Nigeria. *PNLA Quarterly*.

Kuter, B. (2024). The use of information retrieval tools: A study of computer science postgraduate students. http://umexpert.um.edu.my./file/publicaion

Majinge, R. M. (2024). "I don't want to be carried like luggage": Disability and physical access to Tanzanian academic libraries. *Mousaion, 33*(1), 80–102. https://journals.co.za/doi/abs/10.10520/EJC173000

Mansa, H. N. (2017). Role of academic libraries in information access by persons with visual impairment in Southeast Nigeria universities. *Information and Knowledge Management, 5*(9), 102–108.

Muhammad, A., & Hassan, I. A. (2022). Assessing the utilization of assistive technologies by visually impaired students in university libraries in Northern Nigeria. *Nigerian Journal of Library and Information Science, 9*(1), 33–47.

Obim, I. E. (2022). Utilization of assistive technologies for effective library service delivery to students with disabilities in Nigeria. https://www.researchgate.net/publication/365628362

Odigie, I. O. (2021). The place of assistive technologies in the service delivery of special need users in academic libraries of Kogi State. *Library Philosophy and Practice (e-journal)*.

https://digitalcommons.unl.edu/libphilprac/1679

Okiki, O. C. (2017). Information resources awareness, attitude and use by visually impaired students in academic libraries. *International Journal of Advanced Research, 1*(6), 121–129. https://digitalcommons.unl.edu/libphilprac/828

Onifade, G. B., & Sowole, G. M. (2019). Information retrieval tools and utilization of library resources by undergraduate students in federal universities in South–South Zone, Nigeria. *International Journal of Library and Information Science Studies, 5*(2), 36–44.

Pradhan, S., & Samanta, M. (2018). Use of assistive technology in blind schools of West Bengal: A comparative study. *Library Philosophy and Practice*. Retrieved from https://eds.p.ebscohost.com

Samwel, Y. (2017). Accessibility of library information resources to the users with visual impairment in some selected public libraries in Tanzania. *Journal of Medical Library Association, 94*(4), 442–446.

Udofot, C., & Nwachukwu, V. (2019). Utilization of access tools for effective information retrieval in Nigerian universities libraries. *Journal of Library Services and Technologies, 1*(1), 48–56.

UNESCO. (2021, June). *Addressing exclusion in education: A guide to addressing education systems towards more inclusive and just societies*. Retrieved September 4, 2023, from http://www.unesdoc.unesco.co.org/images/0021/002170/217073e.pdf

Watson, S. (2020). Tips for working with students with disabilities. Retrieved October 7, 2023, from http://specialed.about.com/od/physicaldisabilities/p/wheelchair.htm

Witte, L., Steel, E., Gupta, S., Ramos, V. D., & Roentgen, U. (2018). Assistive technology provision: Towards an international framework for assuring availability and accessibility of affordable high-quality assistive technology. *Disability and Rehabilitation: Assistive Technology, 13*(5), 467–472. https://doi.org/10.1080/17483107.2018.1470264